

**DRAGONAIR**

**A320/A321**

**QUICK REFERENCE HANDBOOK**

This volume forms part of the Operations Manual. It is issued by the Operations Department and is authorised by the General Manager (Operations).

Signed : .  
Peter SANDERSON  
General Manager Operations

The holder of this volume is responsible for its revision.

## 安全、質量及保安政策

安全、質量及保安是港龍航空的核心價值。藉著各員工絕不妥協地致力推行各種持續提升質量、保安及安全管理系統計劃，我們務求在這些方面均達到最高的水平。

港龍航空一直以來均十分重視及鼓勵任何有關運作安全及保安事件的報告。我們有既定政策，鼓勵每一位員工向公司匯報任何可能影響航班及地勤營運安全及保安的情況及資料，並積極推動這種文化。我們更製訂了一套程序，適用於航空安全報告、機艙安全報告、地勤安全報告、品質審計報告及保安審查報告所收集紀錄及發放的資訊，確保溝通可以在不受拘束的情況下進行。

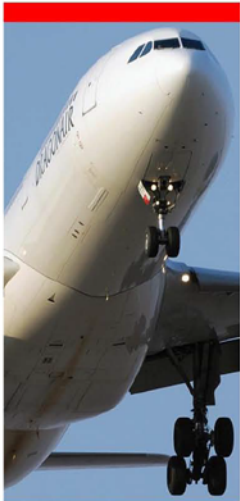
我們亦確立機制，以量度及訂立在所有有關安全、質量及保安方面的主要表現水平，並以嚴謹的風險評審，按其重要性訂定改善措施的優先次序。

為建立互信關係，港龍航空推行公平文化的政策，決不會紀律處分任何匯報有關航班安全事件的員工。但如果有關資訊是來自其他來源，或員工刻意漠視既定的政策及程序，此項政策則不適用。我們希望從錯誤中學習，以不斷提升水平。

作為行政總裁，我自然責無旁貸，除致力履行承諾提供安全的運作及工作環境，我務請大家積極負責，讓港龍航空繼續在安全、品質及保安方面均達致最高的水平，讓顧客、員工及商業夥伴均受惠，並保持公司在這方面的業界領導地位。



DRAGONAIR  
港龍航空



行政總裁 楊偉添

二〇一一年八月

楊偉添

## SAFETY, QUALITY AND SECURITY POLICY

Safety, quality and security are core values of Dragonair. We are dedicated to achieving the highest standards in these disciplines by the uncompromising efforts and vigilance of every employee in implementing continuous quality improvement, security and safety management system programmes that are in place in Dragonair.

It is imperative that we have uninhibited reporting of all incidents and occurrences which compromise the safe and secure conduct of our operations. We have a policy of an open reporting culture where every employee is encouraged to communicate any information that may affect the integrity of flight and ground safety and security. Such communication is free of reprisal. Our method of collecting, recording and disseminating information obtained from Air Safety Reports, Cabin Safety Reports, Ground Safety Reports, Quality Audits and Security Inspections has been developed to achieve this aim.

We have established methods to measure and set key performance standards in all the safety, quality and security disciplines coupled with a rigorous process of risk assessment in order to prioritise the deployment of corrective actions in a timely and efficient manner.

To engender mutual trust, Dragonair has a just culture policy where it will not take disciplinary action against any employee who discloses an incident or occurrence involving safety. This policy shall not apply to information received by the company from a source other than the employee, or when the employee knowingly disregards established policies and procedures. We constantly improve our standards by learning from our own mistakes and errors as well as those made by others.

As the Chief Executive Officer I am ultimately accountable and fully committed to providing a safe operational and working environment. However I require you all to take responsibility to ensure Dragonair maintain its industry position as a leader in providing our customers, employees and business partners with the highest level of safety, quality and security.

  
Patrick Yeung  
Chief Executive Officer  
August 2011

KASQSPDMS-201108-REV2



## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSD**

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FRANCE

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

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		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSD</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HSD</b>				
	OEB30 issue 1.0	W	N	30 MAR 12	No SRS Engagement During Go Around Below MDA
	Criteria: SA <b>Applicable to: B-HSD</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSD</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSD</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSD</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSD</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	Subsection Title	Rev. Date
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-30	No SRS Engagement During Go Around Below MDA	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
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M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSD</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	0756	HDA 0051	B-HSD	320-232


(1) Evolution code : N=New, R=Revised

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTPC36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	27-1189 02		07 APR 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L94 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	27-1189 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L94 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	27-1182 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L93 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	27-1182 02		07 APR 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L93 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	<b>Applicable to: ALL</b>			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	<b>Applicable to: ALL</b>			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	<b>Applicable to: ALL</b>			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	<b>Applicable to: ALL</b>			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	<b>Applicable to: ALL</b>			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	<b>Applicable to: ALL</b>			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	<b>Applicable to: ALL</b>			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	<b>Applicable to: ALL</b>			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF RAIN REPELLENT SYSTEM
	<b>Applicable to: ALL</b>			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	<b>Applicable to: ALL</b>			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	<b>Applicable to: ALL</b>			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	<b>Applicable to: ALL</b>			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	<b>Applicable to: ALL</b>			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			




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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			


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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	<b>Applicable to: ALL</b>			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	<b>Applicable to: ALL</b>			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	<b>Applicable to: ALL</b>			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	<b>Applicable to: ALL</b>			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	<b>Applicable to: ALL</b>			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	<b>Applicable to: ALL</b>			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	<b>Applicable to: ALL</b>			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	<b>Applicable to: ALL</b>			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	<b>Applicable to: ALL</b>			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	<b>Applicable to: ALL</b>			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	<b>Applicable to: ALL</b>			
	31-1141 04		30 AUG 10	INDICATING/RECORDING SYSTEMS - FWS - INTRODUCE FWC STANDARD H1P-E3P.
	<b>Applicable to: ALL</b>			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	<b>Applicable to: ALL</b>			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	<b>Applicable to: ALL</b>			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	<b>Applicable to: ALL</b>			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	<b>Applicable to: ALL</b>			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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**GEN-PLP PRELIMINARY PAGES**

TABLE OF CONTENTS.....	1/2
Important.....	GEN.01
Use of Summaries.....	GEN.02
General Information.....	GEN.03

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IMPORTANT		

### **SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
 As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

### **TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

#### **PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

#### **PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

### **Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

### **ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

### **ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

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## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

00, 01, 02, ...	:	Numbering for ABN, GEN, OPS, OEB PROC sections
01A, 03B, ...	:	Numbering and index (A, B, ...) for procedures written on several paper pages
1/10, 3/5, ...	:	Numbering for NP-NP, FPE-SPO
C1, C2	:	Index of the back cover page interior
C3	:	Index of the back cover page exterior
"BLANK"	:	Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page)

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :


- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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**ABN-PLP PRELIMINARY PAGES**

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**ABN-21 Air Conditioning/Ventilation/Pressurization**

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**ABN-22 Auto Flight**

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<b>LOW ENERGY WARNING.....</b>	<b>22.02</b>

**ABN-24 Electrical**

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<b>ELEC EMER CONFIG Summary.....</b>	<b>24.02</b>
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**ABN-27 Flight Controls**

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<b>HYD G + B SYS LO PR Summary.....</b>	<b>29.02</b>
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<b>WINDSHIELD/WINDOW CRACKED.....</b>	<b>80.12</b>
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## CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

**CAUTION**

Check that  $\Delta P$  is zero before opening the doors.

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## LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### ■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:

#### ● When the system has recovered:

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### ■ DESCENT (IF TIME PERMITS) :

#### ● When the system has recovered:

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.


Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>
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ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



*Continued from the previous page*

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

<sup>(a)</sup> Restored, when speed is below 100 kt.

<sup>(b)</sup> Crew oxygen valve inoperative.

<sup>(c)</sup> Lost, when speed is below 50 kt.


<sup>(d)</sup> Lost 30 s after last engine shutdown.

<sup>(e)</sup> IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

<sup>(f)</sup> For APU start only.

<sup>(g)</sup> Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.



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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● <b>AT 1000 FT AGL:</b> L/G..... DOWN ● <b>When L/G down: BATTERIES ONLY, USE MAN PITCH TRIM</b>

LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>

GO-AROUND
● <b>When L/G uplocked:</b> EMER ELEC PWR.....MAN ON

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
DRY Runway	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

FLT ON BAT ONLY

Flight time on batteries only may be increased to at least 30 min as follows:

ENG MODE SEL..... NORM

ANTI ICE PITOT 1 C/B (D02)..... PULL

26 V ADIRU 1 C/B (F07).....PULL

*CM 1 altitude, speed, and vertical speed indication on PFD are lost. Use standby instruments*

● **7 min before landing:**

ANTI ICE PITOT 1 C/B (D02)..... RESET

● **After 1 min:**

<b>CAUTION</b>	This time delay is necessary to ensure reliable speed information even in icing conditions when the ADIRU is reset to ON.
----------------	---------------------------------------------------------------------------------------------------------------------------

26 V ADIRU 1 C/B (F07).....RESET

COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
 In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT.....

ON
- If fuel vapors:
 

CAB FANS.....

ON

PACK 1+2.....

OFF
- If no fuel vapors:
 

CAB FANS.....

OFF

PACK FLOW.....

HI
- LDG ELEV.....

10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude).....

INITIATE
- ATC.....

NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC.....

CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.
- At FL 100 OR MEA:
 

APU MASTER SW (if in ELEC EMER CONFIG)...

ON

PACK 1+2.....

OFF

MODE SEL.....

MAN

MAN V/S CTL.....

FULL UP

RAM AIR.....

ON

APU MASTER SW.....

OFF
- If smoke persists, open CKPT window:
 

MAX SPEED.....

200 KT

COCKPIT DOOR.....

OPEN

HEADSETS.....

ON

PNF COCKPIT WINDOW.....

OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALLEY..... OFF

SIGNS..... ON

CKPT/CABIN COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMER
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT..... ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATED:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100 or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ELEC EMER CONFIG..... CONSIDER  
*Refer to the end of the procedure to set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING..... CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

● **IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 PACK 1..... OFF

● **If smoke continues:**

PACK 1..... ON  
 PACK 2..... OFF

● **If smoke still continues:**

PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

● **IF CAB EQUIPMENT SMOKE SUSPECTED:**

● **If smoke continues:**

EMER EXIT LIGHT..... ON  
 BUS TIE..... OFF  
 GEN 2..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE

● **If smoke still continues or if faulty equipment confirmed isolated:**

GEN 2..... ON  
 BUS TIE..... AUTO

● **If faulty equipment not confirmed isolated, before L/G extension:**

GEN 2..... ON







## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

BUS TIE.....AUTO

SMOKE/FUMES REMOVAL..... CONSIDER

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER

- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF

EMER ELEC PWR..... MAN ON

- WHEN EMER GEN AVAIL:

APU GEN.....OFF

GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- AT 3 min OR 2 000 ft AAL BEFORE LANDING:  
GEN 2..... ON  
EMER ELEC GEN 1 LINE..... ON

- WHEN A/C IS STOPPED:

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


- Note:
- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
  - In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED


Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
Slats					
S = 0	NO LIMITATION	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1	230 kt				177 kt
S = 1					
1 < S ≤ 3	200 kt		200 kt	185 kt	177 kt
S > 3	177 kt		177 kt	177 kt	

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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<b>SIDESTICK/RUDDER PEDALS STIFF</b>		
<p>Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:</p> <ul style="list-style-type: none"><li>- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or</li><li>- One sidestick and the rudder pedals at the same time.</li></ul> <p>The piloting technique remains the same: The aircraft remains responsive. However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.</p> <p>AP DISENGAGEMENT.....CONFIRM</p> <p>CONSIDER TRANSFERRING CONTROL TO PNF</p> <p>● <b>FOR DECRAB, ROLLOUT, OR ENGINE FAILURE</b></p> <p>BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL</p>		



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**


*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

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<b>STABILIZER JAM</b>		
<p>The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.          The flight control normal law remains active in this case and there is no ECAM warning.</p> <p>AP..... OFF          MAN PITCH TRIM.....CHECK</p> <p><i>The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.</i></p> <p>● <b>IF MAN TRIM AVAIL:</b></p> <p>TRIM FOR NEUTRAL ELEV  <i>If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).</i></p> <p><b>APPR PROC</b></p> <p>● <b>IF MAN TRIM NOT AVAIL:</b></p> <p>FOR LDG.....USE FLAP 3  <i>Do not select configuration full so as not to degrade the handling qualities.</i></p> <p>GPWS LDG FLAP 3..... ON</p> <p>CAT 2 INOP</p>		



**FUEL IMBALANCE**

FOB..... CHECK  
 Compare the FOB + FU, with the FOB at departure.  
 If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. Refer to ABN-28 FUEL LEAK.
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FUEL X FEED..... ON  
 ● On the lighter side and in the center tank:  
   FUEL PUMPS.....OFF  
 ● When fuel is balanced:  
   FUEL PUMPS (WING + CTR)..... ON  
   FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.





## FUEL LEAK (Cont'd)

ENGINE RESTART..... CONSIDER

**CAUTION**

Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.

■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

● **If fuel smell in the cabin:**

APU (if ON)..... OFF

*This prevents additional fuel loss through the APU feeding line.*

● **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**

CTR TK PUMP 1+2..... ON

### **FOR LANDING**

**CAUTION**

Do not use reversers.

GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147


APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75								
<b>CONTA runway (CONF 3)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

CRUISE											
MAX SPD.....											320/0.77
MANEUVER WITH CARE											
ALTN LAW : PROT LOST											
LANDING CONF						APPROACH SPEED					
Use FLAP 3						VAPP = VREF + 25 kt					

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH											
CAT 2 INOP											
SLATS SLOW / FLAPS JAMMED											
GPWS FLAP MODE.....											OFF
<b>● For Flaps extension:</b> SPD SEL..... VFE NEXT - 5KT											
When in landing CONF : DECELERATE TO CALCULATED VAPP											
Stabilize at VAPP before L/G down, to be trimmed for approach.											
L/G GRAVITY EXTENSION											

LANDING											
<b>FLARE:</b> PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law											
<b>SPOILERS:</b> Only 1 per wing											
<b>NO REVERSER</b>											
<b>BRAKING:</b> BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI											
<b>NO NOSEWHEEL STEERING</b>											

GO-AROUND											
NO GEAR RETRACTION. Increased fuel consumption											
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt											
<b>● For diversion:</b> <b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds <b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt											


ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10								
CORRECTIONS	+ 1 000 ft above SL				+ 10 kt tailwind				
DRY runway	+ 3 %				+ 18 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.


*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

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## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*





## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <u>WHEEL</u> SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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**PREPARATION**

CABIN CREW.....	NOTIFY
ATC.....	NOTIFY
GALLEY.....	OFF
<i>Consider fuel reduction to a safe minimum.</i>	
● <b>If NOSE L/G abnormal:</b>	
CG location (if possible).....	AFT
- 10 passengers from front to rear moves the CG roughly 4 % aft.	
- 10 passengers from mid to rear moves the CG roughly 2.5 % aft.	
● <b>If one MAIN L/G abnormal:</b>	
FUEL IMBALANCE.....	CONSIDER
<i>Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.</i>	
OXYGEN CREW SUPPLY.....	OFF
SIGNS.....	ON
CABIN and COCKPIT.....	PREPARE
- Loose equipment secured.	
- Survival equipment prepared.	
- Belts and shoulder harness locked.	

**APPROACH**

GPWS SYS.....	OFF
L/G lever.....	CHECK DOWN
GRVTY GEAR EXTN handcrank.....	TURN BACK TO NORMAL
AUTOBRAKE.....	DO NOT ARM
EMER EXIT LT.....	ON
CABIN REPORT.....	OBTAIN
A/SKID & N/W STRG.....	OFF
MAX BRAKE PR.....	1000 PSI
● <b>If one or both MAIN L/G abnormal:</b>	
GROUND SPOILERS.....	DO NOT ARM

**BEFORE LANDING**

RAM AIR.....	ON
BRACE FOR IMPACT.....	ORDER
● <b>If the external light condition is poor at landing:</b>	
DOMELT.....	DIM

**FLARE, TOUCH DOWN AND ROLL OUT**

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.

Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.





## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW

### (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT




ADR 1 + 2 + 3 FAULT (Cont'd)

- DURING FINAL APPR  
V/S CTL..... FULL UP  
  
*Note: In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup> At slats' extension, full rudder travel authority is recovered.

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NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 ° ,
- 0.9 min for latitudes at or above 55 ° and below 70 ° ,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.
- **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.
  - **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
  - **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
- **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.





## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*  
 LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

- If “H” is written on the “5” key:  
 H KEY..... PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*  
 A/C HEADING..... ENTER  
 ■ If “H” is not written on the “5” key:  
 A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG-ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s).....OFF  
 REMAINING AIR DATA.....CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR.....KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs.....OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF.....USE FLAP 3

APP SPD.....VLS +10

LDG DIST PROC.....APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST.....CLB

FLAPS.....RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	250 kt	10.0/CLB	10.5/CLB	11.5/CLB
FL 50 - FL 100		9.0/CLB	9.5/CLB	10.0/CLB
FL 100 - FL 150		8.0/CLB	8.5/CLB	8.5/CLB
FL 150 - FL 200		7.0/CLB	7.0/CLB	7.0/CLB
FL 200 - FL 250	275 kt	5.0/CLB	5.0/CLB	5.0/CLB
FL 250 - FL 320		4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200-FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

### DESCENT

Set the thrust to IDLE.


CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320-FL 200	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE
FL 200 - FL 100	250 kt	1.5/IDLE	0.5/IDLE	-0.5/IDLE
Below FL 100	250 kt	1.0/IDLE	0.0/IDLE	-1.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.5/IDLE	2.5/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 67 t	67 t - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.5/55.7	5.5/51.5	6.0/47.3
1	S	7.5/58.2	7.5/54.0	7.5/49.0
1+F <sup>(1)</sup>	S	4.5/60.2	4.5/56.1	4.5/51.2
2	F	9.0/61.7	9.0/57.3	9.0/52.8



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## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	7.5/67.2	7.5/62.7	7.5/57.9

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

### FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 67 t	67 t - 55 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	4.5/48.0	4.5/44.4	4.5/41.4

**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

##### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

##### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- **If engine bleed recovery was not successful, or if one pack is inoperative :**  
X BLEED..... CHECK OPEN  
DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
APU.....START  
*Start the APU during the descent.*
- **AT, OR BELOW, FL200 :**  
WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
APU BLEED..... ON  
MAX FL200  
AVOID ICING CONDITIONS
- **IF ICE ACCRETION**  
APPR SPD.....VLS + 10 KT  
LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

ENG DUAL FAILURE - FUEL REMAINING


Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :  
**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THR LEVERS..... IDLE  
FAC 1.....OFF THEN ON  
ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.  
OPTIMUM RELIGHT SPD.....280 KT

*Note:* In the case of an “ENG DUAL FAILURE” during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.  
In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).  
LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*  
VHF1/HF1  /ATC1.....USE  
ATC.....NOTIFY

- **IF NO RELIGHT AFTER 30 SEC:**  
ENG MASTERS..... OFF 30 S/ON  
*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*  
CREW OXY MASKS (Above FL 100).....ON
- **WHEN APU AVAIL FL < 200:**  
WING ANTI ICE..... OFF  
APU BLEED..... ON  
ENG MASTERS (one at a time)..... OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
GALLEY.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*



## ENG DUAL FAILURE - NO FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THRUST LEVERS..... IDLE  
FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....220 KT/GREEN DOT

*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

CREW OXY MASKS (Above FL 100).....ON

CABIN AND COCKPIT.....PREPARE

SIGNS.....ON

GALLEY.....OFF

USE RUDDER WITH CARE

### ● WHEN BELOW FL 150

RAM AIR.....ON

## COMMON ACTIONS FOR THE APPROACH

### APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).

BARO.....SET

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

## IF FORCED LANDING ANTICIPATED

### APPROACH

FOR LDG.....USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED.....150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**


ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

  - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT





ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER


AT TOUCHDOWN  
ENG MASTERS..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

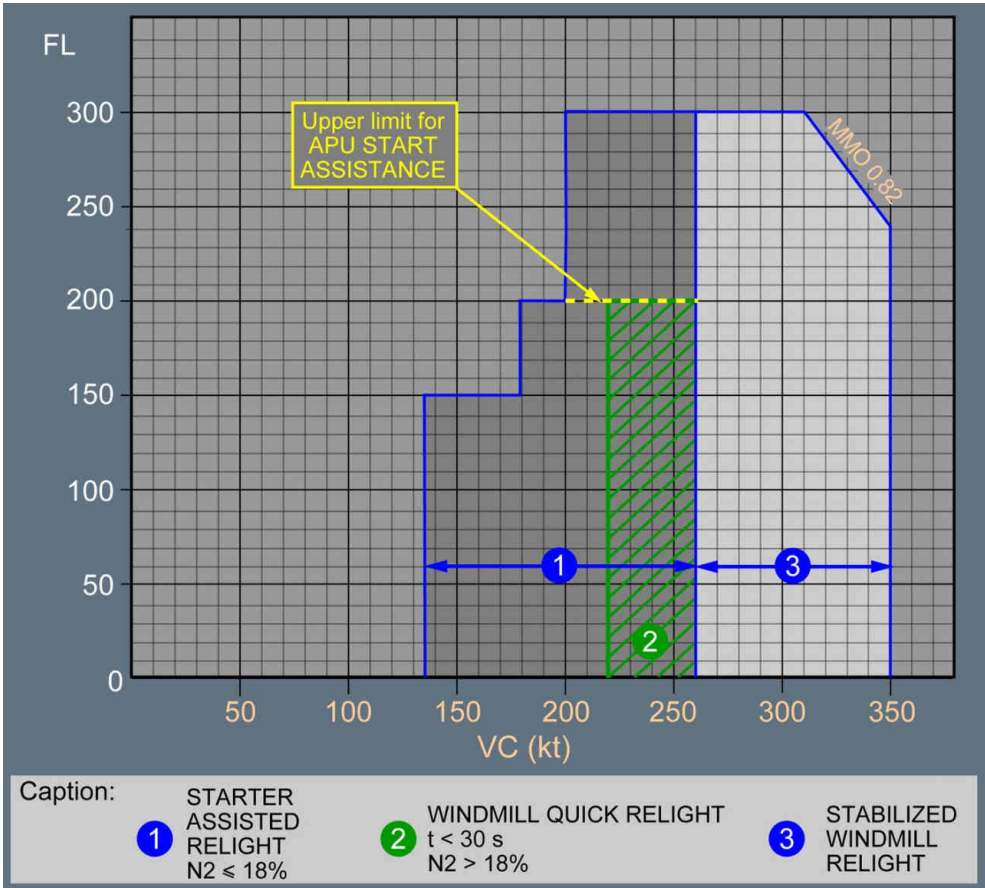
## ENG RELIGHT (IN FLIGHT)

MAX ALTITUDE.....See below  
 ENG MASTER (affected).....OFF  
 THR LEVER (affected)..... IDLE  
 ENG MODE SEL..... IGN  
 X BLEED ..... OPEN  
 WING A. ICE (for starter assist).....OFF  
 ENG MASTER (affected)..... ON

*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*  
*Engine light up should be achieved within 30 s after fuel flow increases.*

- **When idle is reached (AVAIL indication pulses in green) :**
  - ENG MODE SEL..... NORM
  - TCAS MODE SEL  ..... check TA/RA
  - Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*
  - Affected SYS..... RESTORE

- **If no relight :**
  - ENG MASTER (affected)..... OFF
  - Wait 30 s before attempting a new start (to drain the engine).*





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION

External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1  $\geq$  5 units, N2  $\geq$  5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

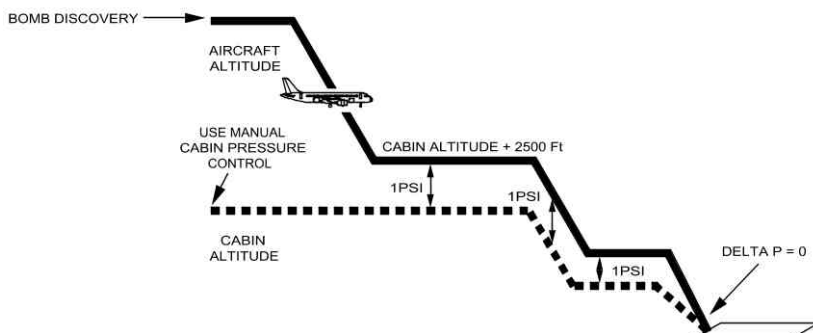
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN





## BOMB ON BOARD (Cont'd)

- **When at CAB ALT+2 500 ft:**
  - 1 PSI DELTA P..... MAINTAIN
  - GALLEY..... OFF
  - FLAPS (fuel permitting)..... AT LEAST CONF 1
  - For landing, use normal configuration.*
  - LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**
  - 1 PSI DELTA P..... MAINTAIN
- **During approach:**
  - CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**
    - EVACUATION..... INITIATE
    - Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**
    - CABIN CREW and PASSENGERS (PA)..... NOTIFY

### **CABIN PROCEDURES**

If a suspect device is found in the cabin:

<b>WARNING</b>	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
<b>WARNING</b>	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
<b>CAUTION</b>	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

**EOD PERSONNEL ON BOARD..... CHECK**

*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

**BOMB..... DO NOT OPEN**

**BOMB..... DO NOT CUT WIRES**

**BOMB..... SECURE AGAINST SLIPPING**

**BOMB..... AVOID SHOCKS**

*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

**PASSENGERS..... LEAD AWAY FROM BOMB**

*Move passengers at least 4 seat rows away from the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*

*Seat backs and tray tables must be in their full upright position.*

*Service items may need to be collected in order to secure tray tables.*

**PORTABLE ELECTRONIC DEVICES..... SWITCH OFF**

*The cabin crews must command passengers to switch off all portable electronic devices.*



## BOMB ON BOARD (Cont'd)

### BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

### EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

### GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

#### ● If the bomb can be moved:

#### RH AFT CABIN DOOR SLIDE.....DISARM

#### LEAST RISK BOMB LOCATION (LRBL).....PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

### BOMB INDICATION LINE.....POSITION

Note: *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

### BOMB.....MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

**CAUTION** Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.

### LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

*Build up at 25 cm (10 in) of wetted material around the sides and on top of the bomb.*





## BOMB ON BOARD (Cont'd)

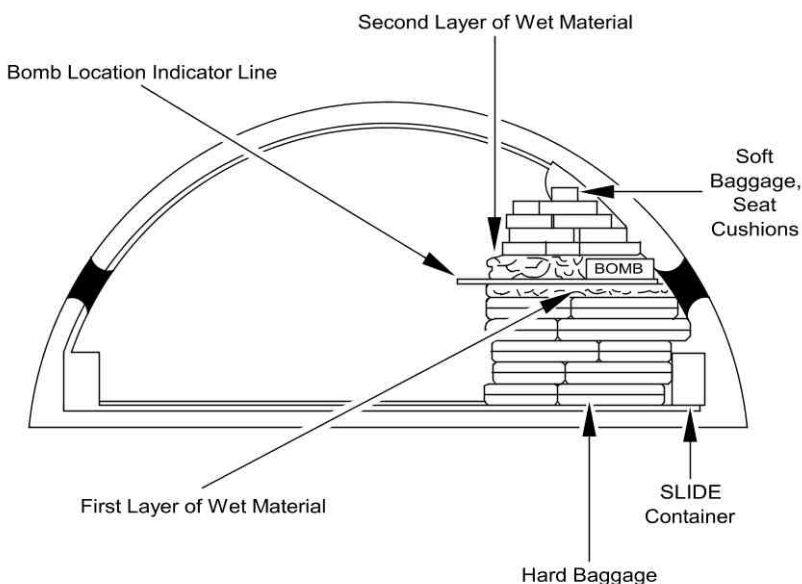
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



### PASSENGERS.....MOVE/ADVISE

*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

### CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*

### EVACUATION/DISEMBARKATION.....EXECUTE

*Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".*

*Use all available airport facilities to disembark without delay.*

## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALLEY.....OFF

LDG ELEV..... SELECT 00

BARO..... SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU)..... DISCH

EVACUATION..... INITIATE



## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### PREPARATION

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALLEY.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### APPROACH

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### AT 2 000 FT AGL

CABIN.....NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT.....ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

#### ● When aircraft has stopped:

PARKING BRK.....ON

ATC (VHF 1).....NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ If Evacuation required:

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)		
<div>■ If Evacuation not required: CABIN CREW and PASSENGERS (PA)..... NOTIFY</div>		



## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS..... ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*

### WHEN DESCENT ESTABLISHED


EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

#### CAUTION

*Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: *The recommendation is to descend with the autopilot engaged.  
Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.  
Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown

REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								





## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note: In case of lack of pitch down authority, reducing thrust may be necessary.

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF



## VOLCANIC ASH ENCOUNTER

● **If the aircraft enters a volcanic ash cloud:**

180 ° TURN..... INITIATE  
ATC..... NOTIFY  
A/THR..... OFF  
THRUST (conditions permitting).....REDUCE  
CREW OXYGEN MASKS.....ON/100 %/EMER  
CABIN CREW.....NOTIFY  
PASSENGER OXYGEN.....AS RQRD  
ENG ANTI ICE..... ON  
WING ANTI ICE..... ON  
PACK FLOW..... HI

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

APU..... START  
ENGINE PARAMETERS..... MONITOR  
AIRSPEED INDICATIONS.....MONITOR

If airspeed is unreliable or lost, Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... FULL UP

Due to the increased noise level, pay particular attention to visual warnings.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ At takeoff

#### ■ If before V1

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ If after V1

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA..... SET OR CONFIRM  
 AP (if engaged)..... KEEP  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

**DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.**

**CLOSELY MONITOR FLIGHT PATH AND SPEED.**

**RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.**

WINDSHIELD/WINDOW ARCING

Affected WINDOW/WINDSHIELD ANTI ICE C/B..... PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)

WINDSHIELD/WINDOW CRACKED

DIAGNOSIS OF INNER PLY.....PERFORM  
*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ If no crack on cockpit side:

No limitation  
*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ If cracks on cockpit side:

MAX FL..... 230/MEA  
*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain ΔP 5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

*Note:*    The following procedure allows maintaining ΔP 5 PSI in manual cabin pressure mode.

CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

ΔP = 5 PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● When starting the descent for approach:

CAB PRESS MODE SEL..... AUTO

*Note:*    If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:

CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL.....FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

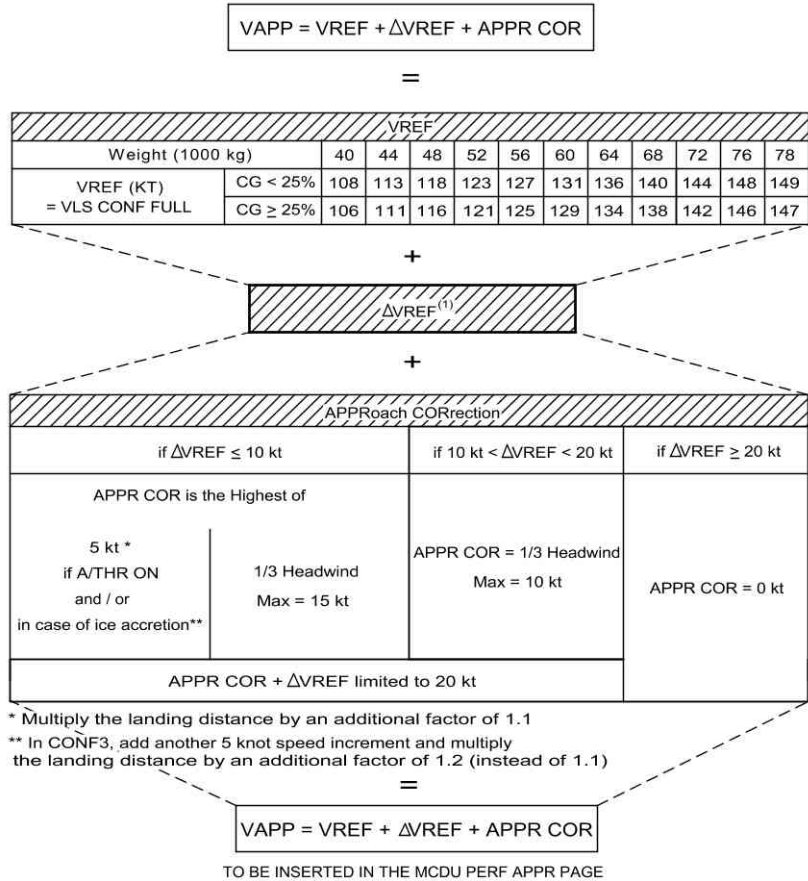


**ECAM ADVISORY CONDITIONS**

SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <b>ENG</b> OIL LO PR warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> <p>In both cases, monitor other engine parameters, especially oil temperature and oil quantity.</p>
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	<p>An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.</p> <p><b>Note:</b> If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</p> <p>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</p> <ol style="list-style-type: none"> <li>1. <i>Low Speed</i>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <i>High Speed</i>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).

# VAPP CALCULATION

## VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### EXAMPLE OF VAPP CALCULATION:

- Failure

:

ALTN LAW
- Flight Conditions

:

Autothrust ON, ice accretion
- Landing Configuration

:

CONF 3
- Headwind

:

12 kt
- Landing Weight/CG

:

48 t/25 %
- VREF determined from the landing weight

:

116 kt
- VREF correction due to the failure (ΔVREF)

:

10 kt


As ΔVREF is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- 5+5 = 10 kt (ice accretion and landing in CONF 3)
- 1/3 Headwind = 12 kt/3 = 4 kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

VAPP = VREF + ΔVREF + APPR CORR = 116 + 10 + 10 = 136 kt



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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors** “WITHOUT REV” when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors** “WITH REV” when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:     *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### **LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE**

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### **LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES**

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
RESULT	3	10			1.40×1.90×1.1=3.00

VREF = 131 kt. Therefore VAPP = 131 + 10 + 5 = 146 kt.

 <div>DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>		<b>ABNORMAL AND EMERGENCY PROCEDURES</b>			<b>80.15A</b>
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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	25			1.95*
RESULT	3	25			1.95


VREF = 140 kt. Therefore VAPP =140+25 =165 kt



**LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY**

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>80.16A</b>
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*Continued from the previous page*

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.



**LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY**

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
NAV	IR 1+2+3 FAULT	3	10	1.85	1.85
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.40*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1  3	55 (APPR) 40 (THRESHOLD) 10	2.00*  1.35*	1.90*  1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25


- <sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- <sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- <sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- <sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.
- <sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)



**LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY**

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*



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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
	IR 1+2+3 FAULT	3	10	1.45	1.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.35*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK / X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.




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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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### COMPUTER RESET

When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor.

The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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**COMPUTER RESET TABLE**

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
22	AUTO FLT FCU 1(2) FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.             </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.             </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*


ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><b>Note:</b></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the 3 C/B:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li><li>• Channel 1 and 2 (L26 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the 3 C/B.</li></ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight</p> <p><u>Note:</u>     After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>     After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>     If during taxi, when the aircraft is moving, <u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT ECAM alert appears along with the NW STRG DISC memo, the flight crew may attempt to perform only one BSCU reset. If the mentioned alert and memo disappear after this BSCU reset, continue the flight.</p> <p><u>Note:</u>     After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:               <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:               <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>



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34	NAV TCAS FAULT	TCAS	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.  <b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>



# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

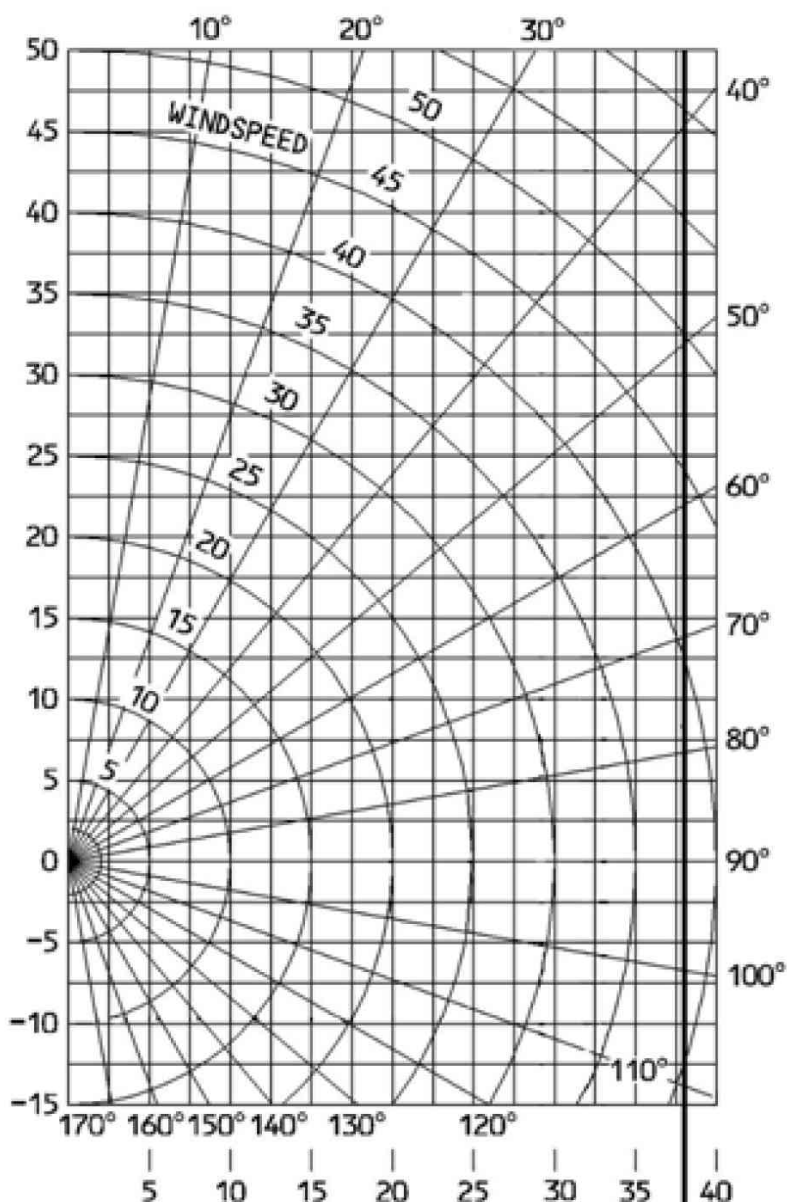
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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

CAT II Autoland  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

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## ACARS LANDING FAIL CODE - A320

SYS	FAILURE		CODE	SYS	FAILURE		CODE
ELEC	AC BUS 1		01	HYD	GREEN		01
	DC BUS 2		02		BLUE		02
	DC ESS BUS if there is no ice accretion		03		YELLOW		03
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05
	DC EMER CONFIG		06		BLUE + YELLOW		06
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01
	EMER ELEC CONFIG		08				
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02
			S ≥ 1	03	NAV	IR 1+2+3 FAULT	
	1 ≤ FLAPS < 2	S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02	
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	03
	2 ≤ FLAPS < 3	S < 1	06	BLEED			DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion
			S ≥ 1		07		
	FLAP = 3	S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)	
		1 ≤ S ≤ 3	09	REV UNLOCK with buffet (CONF 3)		02	
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03	
	FLAP > 3	S < 1	11				
		1 ≤ S ≤ 3	12				
		S > 3	13				
F/CTL	ONE SPLR FAULT		01				
	TWO SPLR FAULT		02				
	THREE SPLR FAULT		03				
	ALL SPLR FAULT/GND SPLR FAULT		04				
	SEC 1 or SEC 3 FAULT		05				
	SEC 2 FAULT		06				
	SEC 2 + 3 FAULT		07				
	SEC 1 + 3 FAULT		08				
	SEC 1 + 2 FAULT		09				
	RUDDER JAM		10				
	SEC 1 + 2 + 3 FAULT		11				
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12				

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SPEEDS

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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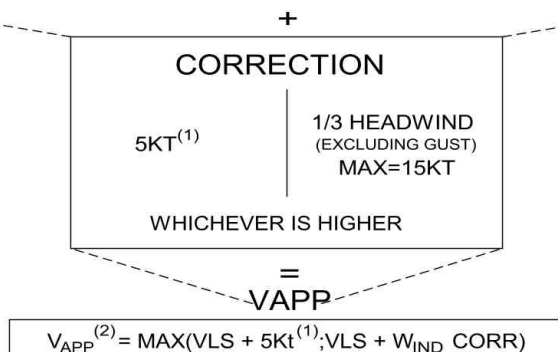
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

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**LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3**

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600
CORRECTION ON ACTUAL LANDING DISTANCE											
RUNWAY CONDITION	dry runway	wet runway	runway covered with								
			standing water	slush		compacted snow		ice			
per 1 000 ft above SL	+3 %	+4 %	+4 %		+5 %		+4 %		+5 %		
per 10 kt headwind	No correction for headwind due to wind correction on approach speed										
per 10 kt tailwind	+17 %	+21 %	+24 %		+22 %		+16 %		+24 %		
forward C.G.	+2 %	+3 %	+3 %		+3 %		+3 %		+3 %		
2 reversers operative	-5 %	-12 %	-15 %		-14 %		-12 %		-27 %		
Per 5 kt speed increment (and no failure) add 8 % (all runways)											

*Note:*    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 × 1.06 × 1.08 = 1 020 m.

**LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL**

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

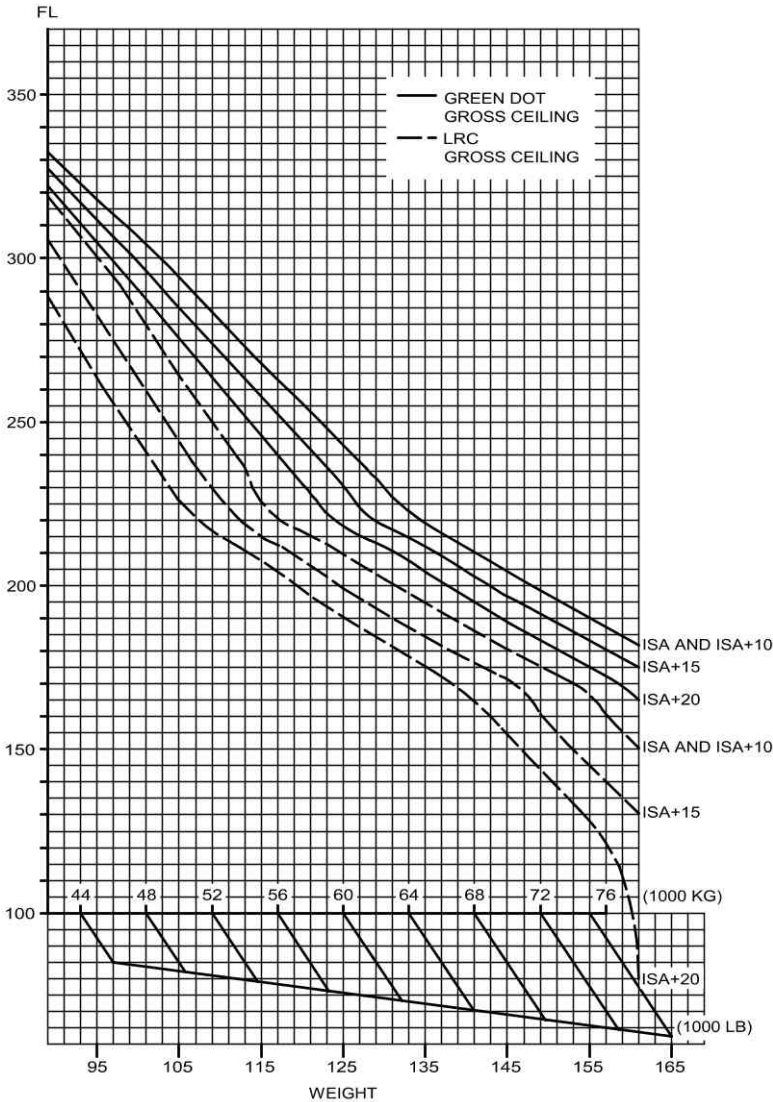
ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

# CEILINGS

**ONE ENGINE OUT**

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT											
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)			
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)			
ANTI ICE OFF				LEVEL OFF (FT)							
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL										
	250	290	310	330	350	370	390				
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200				
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300				
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200				
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200				
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600				
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100				
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800				
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400				
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100				
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600				
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000					
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400					
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800					
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200					
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600						
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON					
FUEL		+ 14 %				+ 28 %					
TIME		+ 13 %				+ 26 %					
DISTANCE		+ 12 %				+ 23 %					
LEVEL OFF		- 700 ft				- 1800 ft					



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## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)	MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
50	1.151 .430 1811 237	1.236 .511 1968 258	1.267 .515 1792 240	1.316 .550 1841 247	1.344 .556 1777 239	1.393 .584 1801 241	
	1.158 .435 1879 240	1.240 .511 1987 257	1.292 .535 1907 250	1.327 .553 1881 248	1.363 .567 1855 244	1.412 .594 1874 246	
54	1.170 .447 1983 247	1.245 .510 2011 257	1.312 .550 1999 256	1.338 .555 1925 249	1.385 .581 1947 251	1.431 .602 1942 249	
	1.183 .461 2098 255	1.250 .510 2040 257	1.323 .553 2044 258	1.355 .565 2001 253	1.404 .592 2024 255	1.440 .600 1963 248	
58	1.226 .510 2373 283	1.260 .514 2095 259	1.333 .555 2086 259	1.374 .576 2086 259	1.417 .595 2071 257	1.444 .585 1952 242	
	1.233 .514 2415 285	1.270 .519 2156 261	1.346 .561 2145 262	1.394 .588 2174 264	1.420 .585 2065 252	1.452 .562 1935 232	
62	1.236 .514 2434 285	1.294 .540 2287 272	1.362 .570 2225 266	1.410 .596 2248 268	1.426 .570 2055 246		
	1.239 .513 2454 284	1.311 .552 2382 279	1.381 .582 2317 272	1.418 .595 2272 267	1.435 .544 2037 234		
66	1.243 .513 2476 284	1.322 .556 2432 281	1.397 .591 2399 277	1.421 .585 2264 263			
	1.247 .512 2499 283	1.330 .558 2472 282	1.412 .599 2473 280	1.426 .570 2253 256			
70	1.254 .514 2550 285	1.338 .560 2516 283	1.426 .604 2537 283	1.436 .543 2232 243			
	1.262 .517 2604 287	1.351 .567 2592 286	1.428 .598 2533 280				
74	1.270 .521 2666 289	1.365 .575 2673 290	1.432 .587 2523 274				
	1.290 .539 2805 299	1.381 .585 2767 296	1.438 .571 2509 267				
78	1.308 .554 2927 307	1.395 .593 2850 300	1.450 .537 2478 250				
	ENGINE ANTI ICE ON △FUEL = + 2.5 %			TOTAL ANTI ICE ON △FUEL = + 6 %			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>4/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

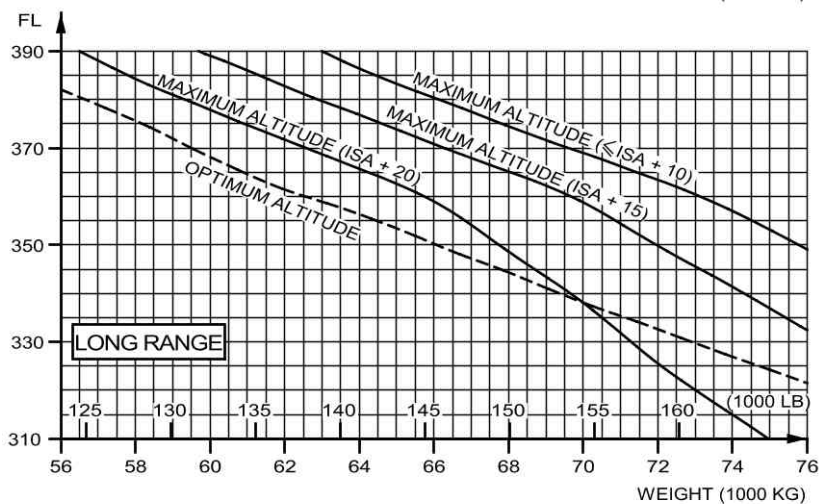
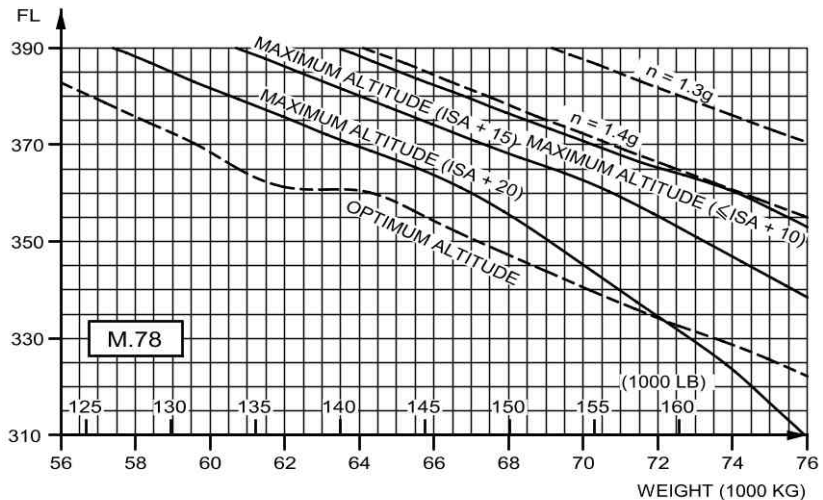
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG PACK FLOW HI ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)  TIME (H.MIN)			
AIR	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
DIST.							FL100	FL200	FL240
(NM)	100	150	200	220	240	250	FL150	FL220	FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %					TOTAL ANTI ICE ON △FUEL = + 6 %				

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NO-04-08-140



## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-AEO</b> <b>2/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

### ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)  TIME (H.MIN)			
AIR  DIST.  (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING ΔFUEL = - 0.4 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %			TOTAL ANTI ICE ON ΔFUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP

CL-NQ-04-10-140

## COST INDEX FOR LONG RANGE CRUISE SPEED

### ALL ENGINES

For a quick determination of the  $CI_{LRC}$ , use:

-  $CI_{LRC} = 40$  kg/min in the FMGC.

or

-  $CI_{LRC} = 55$  (100 lb/h) in the FMGC.



## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									
	45				65				
	TIME	FUEL	DIST.	EPR	TIME	FUEL	DIST.	EPR	IAS
FL	(MIN)	(KG)	(NM)		(MIN)	(KG)	(NM)		(KT)
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
△FUEL = - 1 %			△FUEL = + 3 %			△FUEL = + 7 %			

CL-W0-04-13-140

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-CAB</b> <b>1/2</b> 30 MAR 12
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## IN CRUISE QUICK CHECK FL 100 LONG RANGE

### FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING CRUISE : LONG RANGE - DESCENT : 250KT IMC PROCEDURE : 120 KG (6MIN)								FL100
NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)							
	50	55	60	65	70	75	80	
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15	
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18	
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21	
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24	
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27	
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30	
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34	
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37	
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40	
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43	
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46	
260	1870 1.03	1936 1.00	2004 0.59	2074 0.57	2148 0.55	2222 0.52	2277 0.50	
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.58	2396 0.55	2456 0.53	
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.58	2634 0.56	
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.59	
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02	
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06	
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09	
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12	
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15	
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19	
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22	
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25	
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29	
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32	
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35	
AIR CONDITIONING OFF △FUEL = - 1.5 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 6 %			

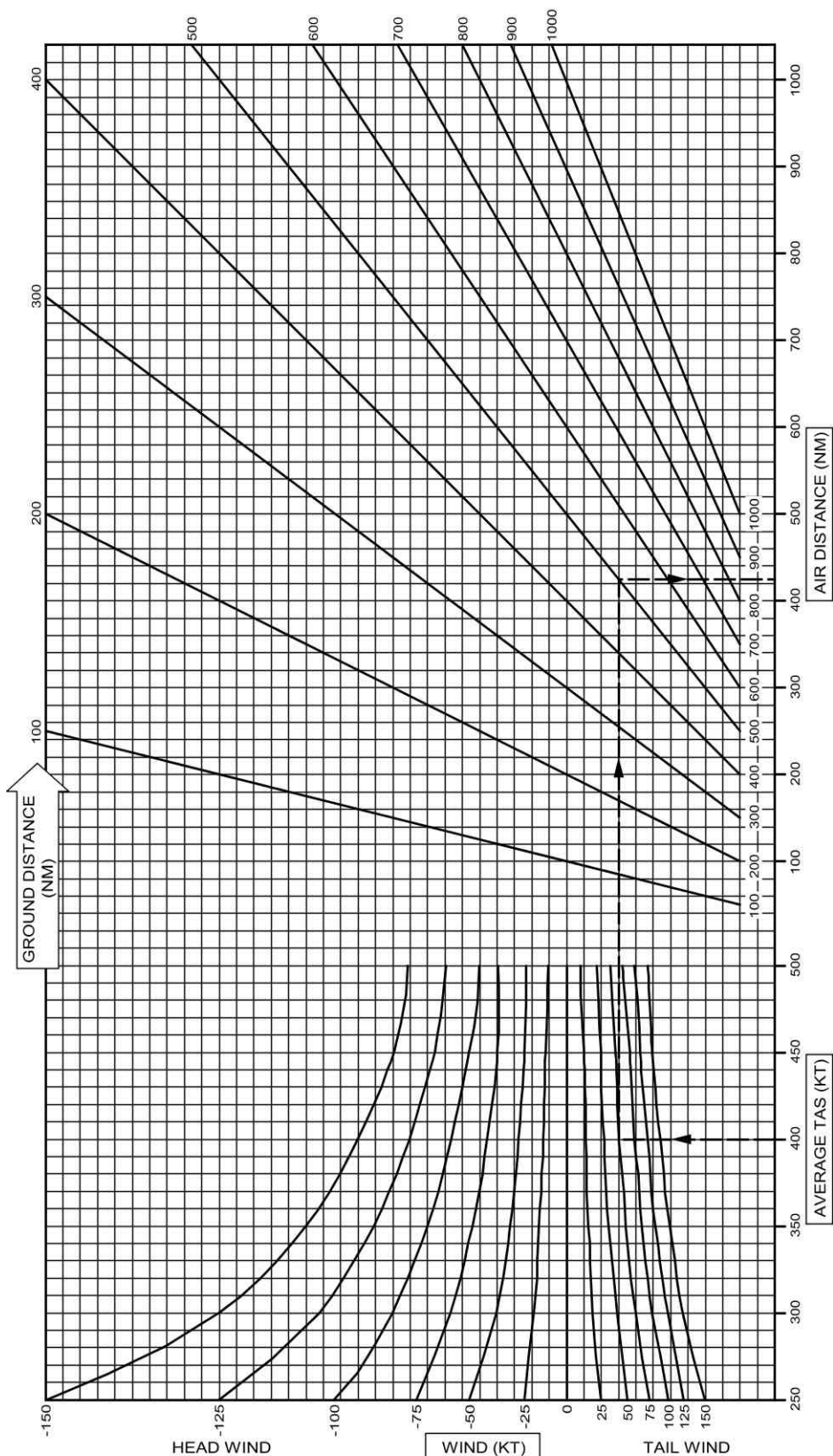
 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	IN FLIGHT PERFORMANCE	FPE-CAB <b>2/2</b>
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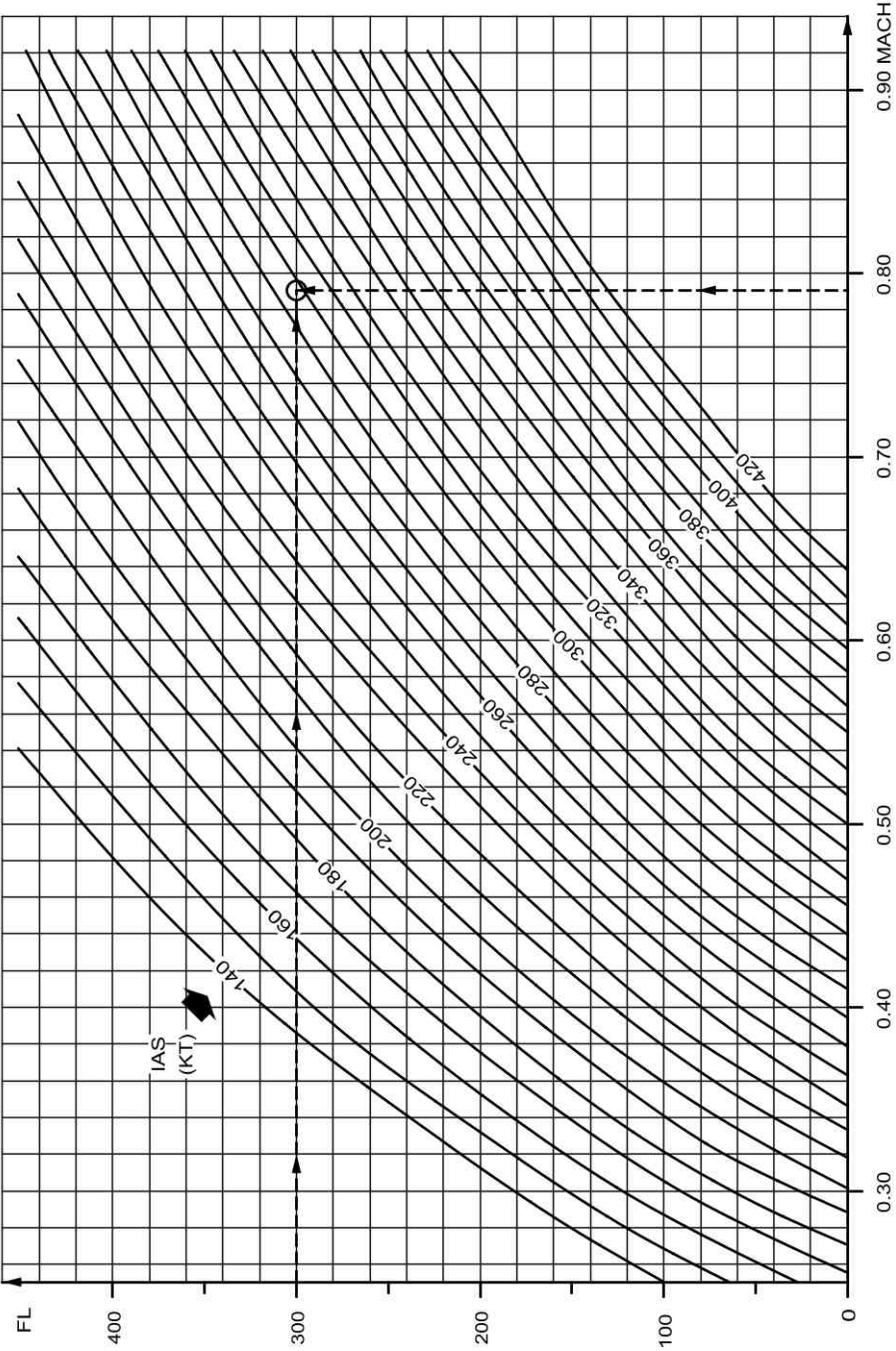




## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT	L/G DOOR	All landing gears doors are extended	15 %
	DOORS NOT CLOSED			

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

## FUEL PENALTY FACTORS/INOP SYS TABLE

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
<b>F/CTL</b>	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
<b>L/G</b>	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

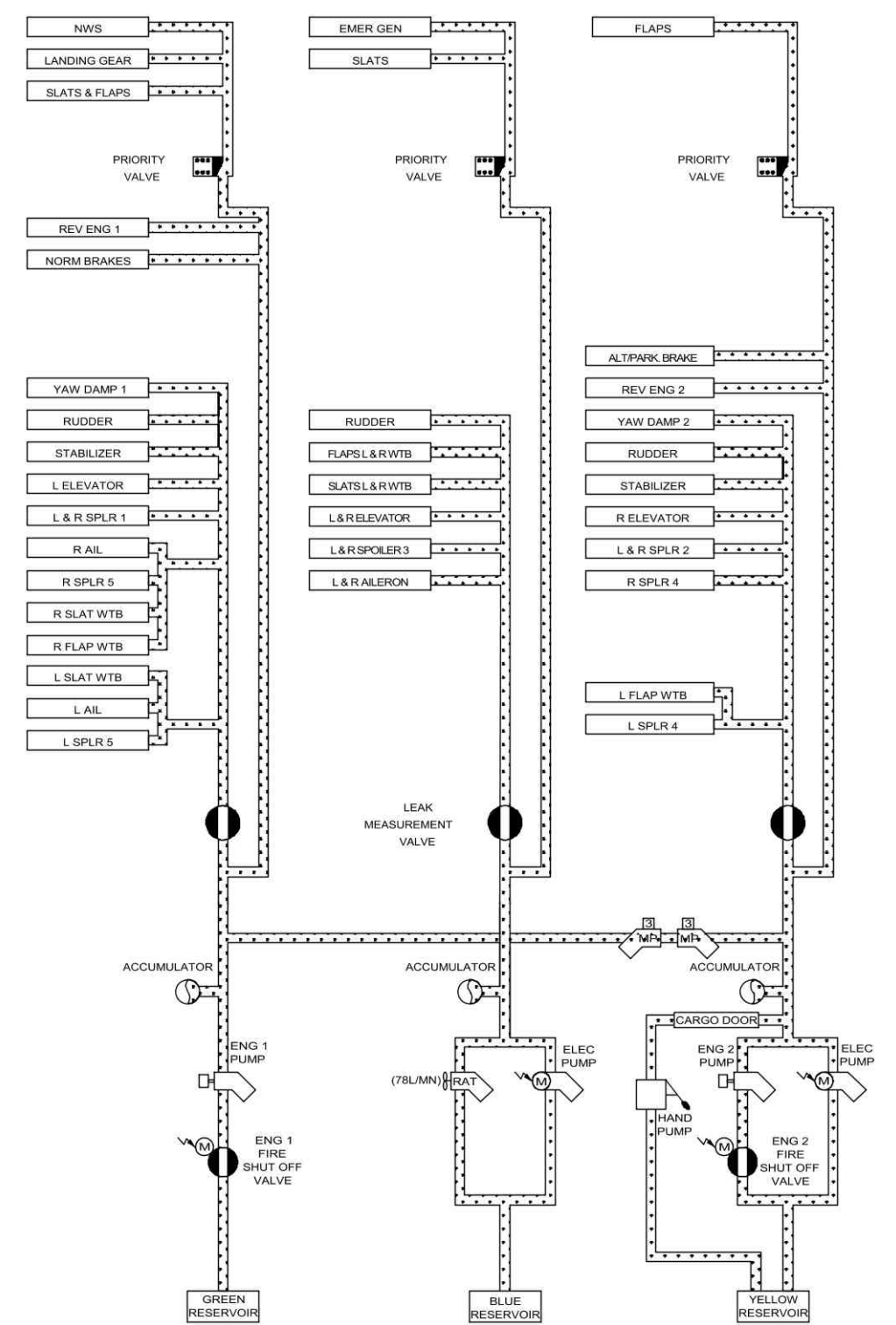
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

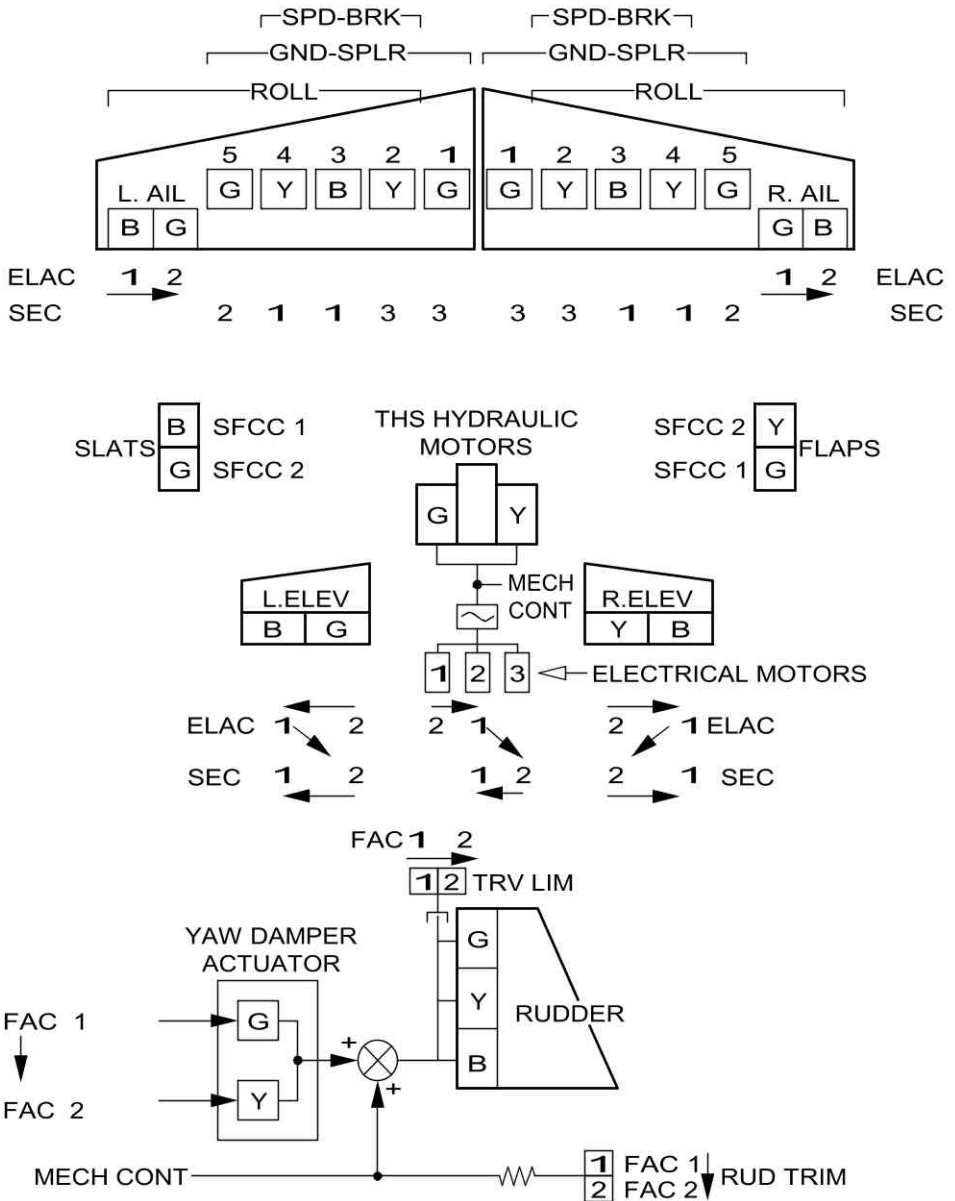
A/THR in managed speed.....USE

HYDRAULIC ARCHITECTURE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
	DH INDICATION	1 for PNF		

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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**"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight.. 11.01**

**OEBPROC-30 No SRS Engagement During Go Around Below MDA**

**No SRS Engagement During Go Around Below MDA..... 30.00**  
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**OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

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**OEBPROC-38 Erroneous Radio Altimeter Height Indication**

**Erroneous Radio Altimeter Height Indication..... 38.00**  
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**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**


**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.00**  
**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.01**

**OEBPROC-43 F/CTL SPOILER FAULT**

**F/CTL SPOILER FAULT..... 43.00**  
**F/CTL SPOILER FAULT..... 43.01**

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**L/G GEAR NOT DOWNLOCKED..... 44.00**  
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## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an **ENG 1(2) OIL FILTER CLOG** ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSD					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSD					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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# OEB30 Issue 1.0

## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.


**Reason for issue:** This OEB replaces the A320 OEB 188.  
 One Operator reported a case where the flight crew initiated a Go Around slightly below the Minimum Descent Altitude (MDA), and the aircraft did not pitch up as expected. The flight crew performed a non precision approach (a VORDME approach) using the FINAL APP managed guidance mode with the AP1 (Autopilot) engaged during the final approach.  
 This OEB is issued to provide flight crews with an operational procedure to avoid such aircraft behavior.  
 The operational procedure provided in this OEB applies to all Non Precision Approaches, for both conventional approaches and RNAV approaches, flown in FINAL APP managed guidance mode.

**Applicable to:** All A318/A319/A320/A321 aircraft

**Cancelled by:** Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.  
 Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013526.0002001	30 MAR 12
Criteria: SA Applicable to: B-HSD					
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013527.0002001	30 MAR 12
Criteria: SA Applicable to: B-HSD					





## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

### ECAM ENTRY

None

### PROCEDURE

During a non precision approach, when using the FINAL APP managed guidance mode:

- **At DA(DH) or MDA(MDH), or earlier in approach if visual conditions are obtained:**

DISENGAGE the FINAL APP mode by pressing the APPR pushbutton on the FCU.

When the flight crew presses the APPR pb in order to disengage the FINAL APP managed guidance mode, a basic vertical guidance mode, either V/S or FPA, engages.

This ensures that the SRS and GA TRK guidance modes correctly engage, if the flight crew initiates a go-around slightly below MDA (MDH).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSD				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSD				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSD				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSD				





## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSD				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSD				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



# AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).



## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSD				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSD				





## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



**F/CTL SPOILER FAULT (Cont'd)**

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<div>44.00</div> <div>30 MAR 12</div>
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## OEB44 Issue 2.0

# L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSD				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSD				

L/G GEAR NOT DOWNLOCKED

**ECAM ENTRY**

L/G GEAR NOT DOWNLOCKED

**PROCEDURE**

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

L/G GEAR NOT DOWNLOCKED	
<i>This warning appears, if the landing gear sequence is not completed after 30 seconds.</i>	
L/G lever.....	RECYCLE
•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:	
L/G GRAVITY EXTENSION PROC.....	APPLY
STATUS	
The status displayed on the ECAM is correct.	

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	<b>BLANK</b>
		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSE**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	1/2
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSE</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HSE</b>				
	OEB30 issue 1.0	W	N	30 MAR 12	No SRS Engagement During Go Around Below MDA
	Criteria: SA <b>Applicable to: B-HSE</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSE</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSE</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSE</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSE</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-30	No SRS Engagement During Go Around Below MDA	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSE</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	0784	HDA 0052	B-HSE	320-232

(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTPC36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	27-1189 02		07 APR 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L94 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	27-1189 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L94 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	27-1182 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L93 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>2/6</b>
		30 MAR 12


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	<b>Applicable to: ALL</b>			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	<b>Applicable to: ALL</b>			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	<b>Applicable to: ALL</b>			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	<b>Applicable to: ALL</b>			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	<b>Applicable to: ALL</b>			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	<b>Applicable to: ALL</b>			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	<b>Applicable to: ALL</b>			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	<b>Applicable to: ALL</b>			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF RAIN REPELLENT SYSTEM
	<b>Applicable to: ALL</b>			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	<b>Applicable to: ALL</b>			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	<b>Applicable to: ALL</b>			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	<b>Applicable to: ALL</b>			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	<b>Applicable to: ALL</b>			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P4287	31-1113 30 31-1264 04	07 APR 11	INDICATING/RECORDING SYSTEMS - FWC - DEFINE OEB REMINDER WITHIN FWC STD -E1 AND SUBSEQUENT
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	Applicable to: ALL			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	Applicable to: ALL			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	32-1369 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INTRODUCE BSCU STD 10.1 - SB ONLY.
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	31-1141 04		30 AUG 10	INDICATING/RECORDING SYSTEMS - FWS - INTRODUCE FWC STANDARD H1P-E3P.
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

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## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

00, 01, 02, ...	:	Numbering for ABN, GEN, OPS, OEB PROC sections
01A, 03B, ...	:	Numbering and index (A, B, ...) for procedures written on several paper pages
1/10, 3/5, ...	:	Numbering for NP-NP, FPE-SPO
C1, C2	:	Index of the back cover page interior
C3	:	Index of the back cover page exterior
"BLANK"	:	Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page)

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :


- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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<b>Computer Reset Table.....</b>	<b>80.21</b>
<b>■ EMERGENCY EVACUATION ■.....</b>	<b>80.C2</b>

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## CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

**CAUTION**

Check that  $\Delta P$  is zero before opening the doors.

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## LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### ■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:

#### ● When the system has recovered:

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### ■ DESCENT (IF TIME PERMITS) :

#### ● When the system has recovered:

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.


Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>
---------------------------------------

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



Continued from the previous page

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a)

Restored, when speed is below 100 kt.

(b)

Crew oxygen valve inoperative.

(c)

Lost, when speed is below 50 kt.

(d)

Lost 30 s after last engine shutdown.

(e)

IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied


(f)

For APU start only.

(g)

Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.



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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● <b>AT 1000 FT AGL:</b> L/G..... DOWN ● <b>When L/G down: BATTERIES ONLY, USE MAN PITCH TRIM</b>	

LANDING	
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>	

GO-AROUND	
● <b>When L/G uplocked:</b> EMER ELEC PWR.....MAN ON	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
DRY Runway	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

FLT ON BAT ONLY

Flight time on batteries only may be increased to at least 30 min as follows:

ENG MODE SEL..... NORM

ANTI ICE PITOT 1 C/B (D02)..... PULL

26 V ADIRU 1 C/B (F07).....PULL

*CM 1 altitude, speed, and vertical speed indication on PFD are lost. Use standby instruments*

● **7 min before landing:**

ANTI ICE PITOT 1 C/B (D02)..... RESET

● **After 1 min:**

<b>CAUTION</b>	This time delay is necessary to ensure reliable speed information even in icing conditions when the ADIRU is reset to ON.
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26 V ADIRU 1 C/B (F07).....RESET

COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● If one or more electrical latches (strikes) are faulty:

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● If two pressure sensors are faulty:

Automatic latch release is not available, in case of cockpit decompression.

● If no LED on the CKPT DOOR CONT panel is on:

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT..... ON
- **If fuel vapors:**

CAB FANS..... ON

PACK 1+2..... OFF
- **If no fuel vapors:**

CAB FANS..... OFF

PACK FLOW..... HI
- LDG ELEV..... 10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE
- ATC..... NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*
- **At FL 100 OR MEA:**

APU MASTER SW (if in ELEC EMER CONFIG)... ON

PACK 1+2..... OFF

MODE SEL.....MAN

MAN V/S CTL..... FULL UP

RAM AIR..... ON

APU MASTER SW.....OFF
- **If smoke persists, open CKPT window:**

MAX SPEED.....200 KT

COCKPIT DOOR.....OPEN

HEADSETS..... ON

PNF COCKPIT WINDOW..... OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALLEY..... OFF

SIGNS..... ON

CKPT/CABIN COM..... ESTABLISH

- **IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMER
- **IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT..... ISOLATE
- **IF SMOKE SOURCE NOT IMMEDIATELY ISOLATED:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100 or MEA, or minimum obstacle clearance altitude)..... INITIATE

● **AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL.....CONSIDER  
 ELEC EMER CONFIG.....CONSIDER  
*Refer to the end of the procedure to set ELEC EMER CONFIG*

● **At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING.....CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

## **AIR COND SMOKE/CAB EQUIPMENT SMOKE**

### ● **IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 PACK 1..... OFF

### ● **If smoke continues:**

PACK 1..... ON  
 PACK 2..... OFF

### ● **If smoke still continues:**

PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

### ● **IF CAB EQUIPMENT SMOKE SUSPECTED:**

### ● **If smoke continues:**

EMER EXIT LIGHT..... ON  
 BUS TIE..... OFF  
 GEN 2..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE

### ● **If smoke still continues or if faulty equipment confirmed isolated:**

GEN 2..... ON  
 BUS TIE..... AUTO

### ● **If faulty equipment not confirmed isolated, before L/G extension:**

GEN 2..... ON







## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

BUS TIE.....AUTO

SMOKE/FUMES REMOVAL..... CONSIDER

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER

- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF

EMER ELEC PWR..... MAN ON

#### ● WHEN EMER GEN AVAIL:

APU GEN ..... OFF

GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

#### ● JUST BEFORE L/G EXTENSION:

GEN 2..... ON

EMER ELEC GEN 1LINE..... ON

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

### ■ Repeat the following until landing configuration is reached:

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.

### ● As speed reduces through VFE NEXT:

FLAPS LEVER..... ONE STEP DOWN

### ■ When landing configuration is established:

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

### ■ IF SLATS FAULT:

#### ● FOR CIRCUIT:

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

#### ● FOR DIVERSION

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

### ■ IF FLAPS FAULT:

#### ● FOR CIRCUIT:

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

#### ● FOR DIVERSION:

##### ● If FLAPS jammed at 0

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt

Note:


- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED

Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
Slats					
S = 0	NO LIMITATION	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1	230 kt				177 kt
S = 1					
1 < S ≤ 3	200 kt		200 kt	185 kt	
S > 3	177 kt		177 kt	177 kt	177 kt

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM

CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

# STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

**● IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

**● IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP



<b>FUEL IMBALANCE</b>
-----------------------

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.*  
*If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON  
 ● **On the lighter side and in the center tank:**  
     FUEL PUMPS.....OFF  
 ● **When fuel is balanced:**  
     FUEL PUMPS (WING + CTR)..... ON  
     FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.


FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



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**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*
- **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**  
 CTR TK PUMP 1+2..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75								
<b>CONTA runway (CONF 3)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

**HYD G + B SYS LO PR SUMMARY**

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP
SLATS JAMMED/FLAPS SLOW
ATHR..... OFF
GPWS LDG FLAP 3..... ON
<ul style="list-style-type: none"> <li>● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN</li> <li>● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i></li> </ul>

LANDING
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law
<b>SPOILERS:</b> Only 2 per wing
<b>REVERSER:</b> Only N°2
<b>BRAKING:</b> ALTERNATE
<b>NO NOSE WHEEL STEERING</b>


GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption
<ul style="list-style-type: none"> <li>● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt</li> <li>● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt</li> </ul>

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
<b>WEIGHT (1 000 KG)</b>	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
<b>WET runway</b>	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
<b>CONTA runway</b>	<i>Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95</i>								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (*Refer to VAPP Calculation*).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

### APPROACH

CAT 2 INOP	
SLATS SLOW / FLAPS JAMMED	
GPWS FLAP MODE.....	OFF
<b>● For Flaps extension:</b> SPD SEL..... VFE NEXT - 5KT	
When in landing CONF : DECELERATE TO CALCULATED VAPP	
Stabilize at VAPP before L/G down, to be trimmed for approach.	
L/G GRAVITY EXTENSION	

### LANDING

<b>FLARE:</b>	PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law
<b>SPOILERS:</b>	Only 1 per wing
<b>NO REVERSER</b>	
<b>BRAKING:</b>	BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI
<b>NO NOSEWHEEL STEERING</b>	

### GO-AROUND

NO GEAR RETRACTION. Increased fuel consumption	
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
<b>● For diversion:</b> <b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds <b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt	


ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV										
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78	
<b>DRY runway</b>	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15									
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10									
<b>CORRECTIONS</b>	+ 1 000 ft above SL					+ 10 kt tailwind				
<b>DRY runway</b>	+ 3 %					+ 18 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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**DOUBLE AOA HEAT FAILURE**

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*





## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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**PREPARATION**

- CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF  
*Consider fuel reduction to a safe minimum.*
- **If NOSE L/G abnormal:**  
 CG location (if possible).....AFT
    - 10 passengers from front to rear moves the CG roughly 4 % aft.
    - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.
  - **If one MAIN L/G abnormal:**  
 FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*
- OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE
 
  - Loose equipment secured.
  - Survival equipment prepared.
  - Belts and shoulder harness locked.

**APPROACH**

- GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI
- **If one or both MAIN L/G abnormal:**  
 GROUND SPOILERS.....DO NOT ARM

**BEFORE LANDING**

- RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER
- **If the external light condition is poor at landing:**  
 DOME LT.....DIM

**FLARE, TOUCH DOWN AND ROLL OUT**

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.

Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.





## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW

### (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT




ADR 1 + 2 + 3 FAULT (Cont'd)

- DURING FINAL APPR  
V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup> At slats' extension, full rudder travel authority is recovered.

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NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.
- **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.
  - **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
  - **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
- **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.





## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

## IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

- If “H” is written on the “5” key:  
 H KEY..... PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*  
 A/C HEADING..... ENTER
- If “H” is not written on the “5” key:  
 A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG-ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and  $V_{MAX}$ .*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

**FLYING TECHNIQUE TO STABILIZE SPEED :**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target:

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

**WHEN FLIGHT PATH IS STABILIZED**

PROBE/WINDOW HEAT.....ON

**TECHNICAL RECOMMENDATIONS:**

- Respect Stall Warning
- To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:
  - Do not use FPV and/or V/S, which are affected.
  - ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
----------------	-------------------------------------------------------------------------------------------------------------------------------------------------------

### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR..... KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF..... USE FLAP 3

APP SPD..... VLS +10

LDG DIST PROC..... APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST..... CLB

FLAPS..... RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	250 kt	10.0/CLB	10.5/CLB	11.5/CLB
FL 50 - FL 100		9.0/CLB	9.5/CLB	10.0/CLB
FL 100 - FL 150		8.0/CLB	8.5/CLB	8.5/CLB
FL 150 - FL 200		7.0/CLB	7.0/CLB	7.0/CLB
FL 200 - FL 250	275 kt	5.0/CLB	5.0/CLB	5.0/CLB
FL 250 - FL 320		4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.

When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200-FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320-FL 200	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE
FL 200 - FL 100	250 kt	1.5/IDLE	0.5/IDLE	-0.5/IDLE
Below FL 100	250 kt	1.0/IDLE	0.0/IDLE	-1.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.5/IDLE	2.5/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 67 t	67 t - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.5/55.7	5.5/51.5	6.0/47.3
1	S	7.5/58.2	7.5/54.0	7.5/49.0
1+F <sup>(1)</sup>	S	4.5/60.2	4.5/56.1	4.5/51.2
2	F	9.0/61.7	9.0/57.3	9.0/52.8



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	7.5/67.2	7.5/62.7	7.5/57.9

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

### FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 67 t	67 t - 55 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	4.5/48.0	4.5/44.4	4.5/41.4

**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :
  - X BLEED..... CHECK OPEN
  - DESCENT TO FL200/MEA.....CONTINUE
  - Descend rapidly to FL 200, to recover the bleed supply from the APU*
  - APU.....START
  - Start the APU during the descent.*
  - **AT, OR BELOW, FL200 :**
    - WING A.ICE..... OFF
    - APU BLEED must not be used for wing anti-ice.*
    - APU BLEED..... ON
    - MAX FL200
    - AVOID ICING CONDITIONS
    - **IF ICE ACCRETION**
      - APPR SPD.....VLS + 10 KT
      - LDG DIST PROC..... APPLY
      - Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

ENG DUAL FAILURE - FUEL REMAINING

As long as none of the engines recover, the flight crew should apply this paper procedure and then, if time permits, clear ECAM alerts and check the ECAM. STATUS page.

LAND ASAP

ENG MODE SEL.....IGN  
THRUST LEVERS.....IDLE  
OPTIMUM RELIGHT SPD.....280 KT

Note: In the case of an “ENG DUAL FAILURE” during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.

In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).

LANDING STRATEGY.....DETERMINE  
Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.

EMER ELEC PWR.....MAN ON  
VHF1/HF1 /ATC1.....USE  
ATC.....NOTIFY  
FAC 1.....OFF THEN ON  
Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.

- IF NO RELIGHT AFTER 30 SEC:  
ENG MASTERS.....OFF 30 S/ON  
Unassisted start attempts can be repeated until successful, or until APU bleed is available.  
CREW OXY MASKS (Above FL 100).....ON

- WHEN APU AVAIL FL < 200:  
WING ANTI ICE.....OFF  
APU BLEED.....ON  
ENG MASTERS (one at a time).....OFF 30 S/ON

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS..... ON  
GALLEY..... OFF  
USE RUDDER WITH CARE

● WHEN BELOW FL 150  
RAM AIR..... ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.  
MIN APPR SPEED..... 150 KT  
VAPP..... DETERMINE  
Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):

● When in CONF 3 and VAPP:  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.

● When L/G downlocked  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

AT 2 000 FT AGL  
CABIN.....NOTIFY FOR LANDING

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY


### AFTER LANDING

#### ● When the aircraft has stopped:

PARKING BRK.....ON  
ATC.....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENTS (ENG and APU).....DISCH

*Engine Agent 2 is not available.*

#### ■ If Evacuation required:

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter.*

#### ■ If Evacuation not required:

CABIN CREW and PASSENGERS (PA).....NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

#### ● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)

L/G lever..... CHECK UP

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER


### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

AFTER DITCHING

- ATC (VHF 1).....NOTIFY
- FIRE pushbutton (ENG and APU).....PUSH
- AGENT (ENG and APU)..... DISCH
- Engine Agent 2 is not available.*
- EVACUATION..... INITIATE
- ELT  ..... CHECK EMITTING
- If not, switch on the transmitter.*


**ENG DUAL FAILURE - NO FUEL REMAINING**

The flight crew should apply this paper procedure and then, if time permits, clear ECAM warnings and check the ECAM STATUS page.

THRUST LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
*Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.*  
 OPTIMUM SPEED.....220 KT/GREEN DOT  
*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .

LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*  
 EMER ELEC POWER (if EMER GEN not in line).....MAN ON  
 VHF1/HF1  /ATC1.....USE  
 ATC.....NOTIFY  
 CREW OXY MASKS (Above FL 100).....ON  
 CABIN AND COCKPIT.....PREPARE  
 SIGNS.....ON  
 GALLEY.....OFF  
 USE RUDDER WITH CARE  
 ● **WHEN BELOW FL 150**  
 RAM AIR..... ON

**COMMON ACTIONS FOR THE APPROACH**

**APPROACH PREPARATION**

*Note:* Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).  
 BARO..... SET  
 CREW MASKS/OXY SUPPLY (below FL 100).....OFF

**IF FORCED LANDING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
 MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE

*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**  
 GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
 L/G lever..... DOWN  
 APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*
- GND SPLR..... ARM
- MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**

ENG MASTERS..... OFF

BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**
  - PARKING BRK.....ON
  - ATC.....NOTIFY
  - **If Evacuation required :**  
 EVACUATION.....INITIATE  
 ELT .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**  
 CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*

MIN APPR SPEED..... 150 KT





ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*


## ENG RELIGHT (IN FLIGHT)

- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*

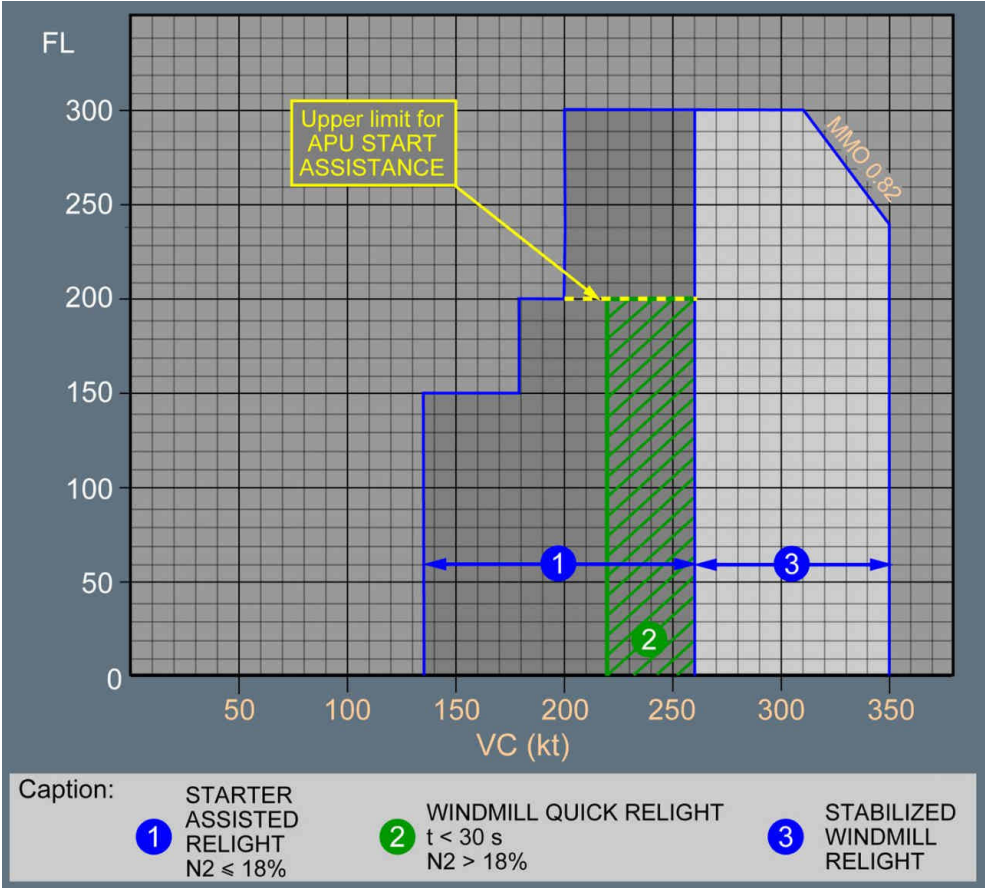
*Engine light up should be achieved within 30 s after fuel flow increases.*

■ **When idle is reached:**

- |                                                                                                       |             |
|-------------------------------------------------------------------------------------------------------|-------------|
| ENG MODE SEL.....                                                                                     | NORM        |
| TCAS MODE SEL  ..... | check TA/RA |
- Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*
- |                   |         |
|-------------------|---------|
| Affected SYS..... | RESTORE |
|-------------------|---------|

■ **If no relight:**

- |                            |     |
|----------------------------|-----|
| ENG MASTER (affected)..... | OFF |
|----------------------------|-----|
- Wait 30 s before attempting a new start (to drain the engine).*





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
---------	---------------------------------------------------------------------------------------------------------------------------------------------

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

- When burning has stopped :  
MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1  $\geq$  5 units, N2  $\geq$  5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

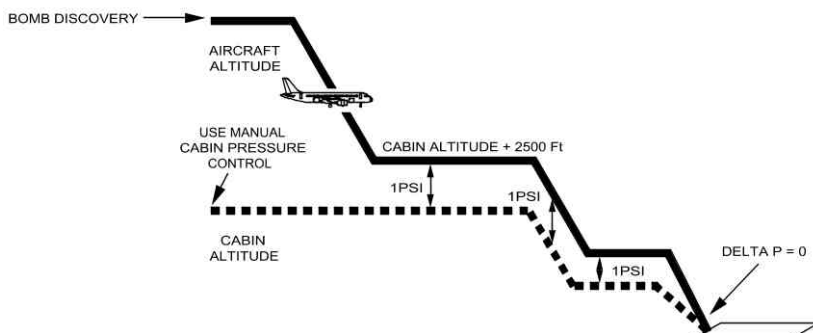
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE
<i>Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.</i>	
NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN
<i>Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.</i>	
DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN





## BOMB ON BOARD (Cont'd)

- **When at CAB ALT+2 500 ft:**
  - 1 PSI DELTA P..... MAINTAIN
  - GALLEY..... OFF
  - FLAPS (fuel permitting)..... AT LEAST CONF 1
  - For landing, use normal configuration.*
  - LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**
  - 1 PSI DELTA P..... MAINTAIN
- **During approach:**
  - CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**
    - EVACUATION..... INITIATE
    - Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**
    - CABIN CREW and PASSENGERS (PA)..... NOTIFY

### **CABIN PROCEDURES**

If a suspect device is found in the cabin:

<b>WARNING</b>	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
<b>WARNING</b>	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
<b>CAUTION</b>	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

**EOD PERSONNEL ON BOARD..... CHECK**

*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

**BOMB..... DO NOT OPEN**

**BOMB..... DO NOT CUT WIRES**

**BOMB..... SECURE AGAINST SLIPPING**

**BOMB..... AVOID SHOCKS**

*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

**PASSENGERS..... LEAD AWAY FROM BOMB**

*Move passengers at least 4 seat rows away from the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*

*Seat backs and tray tables must be in their full upright position.*

*Service items may need to be collected in order to secure tray tables.*

**PORTABLE ELECTRONIC DEVICES..... SWITCH OFF**

*The cabin crews must command passengers to switch off all portable electronic devices.*



## BOMB ON BOARD (Cont'd)

### BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

### EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

### GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

#### ● If the bomb can be moved:

#### RH AFT CABIN DOOR SLIDE.....DISARM

#### LEAST RISK BOMB LOCATION (LRBL).....PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

### BOMB INDICATION LINE.....POSITION

Note: A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

### BOMB.....MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

**CAUTION** Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.

### LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

*Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.*





## BOMB ON BOARD (Cont'd)

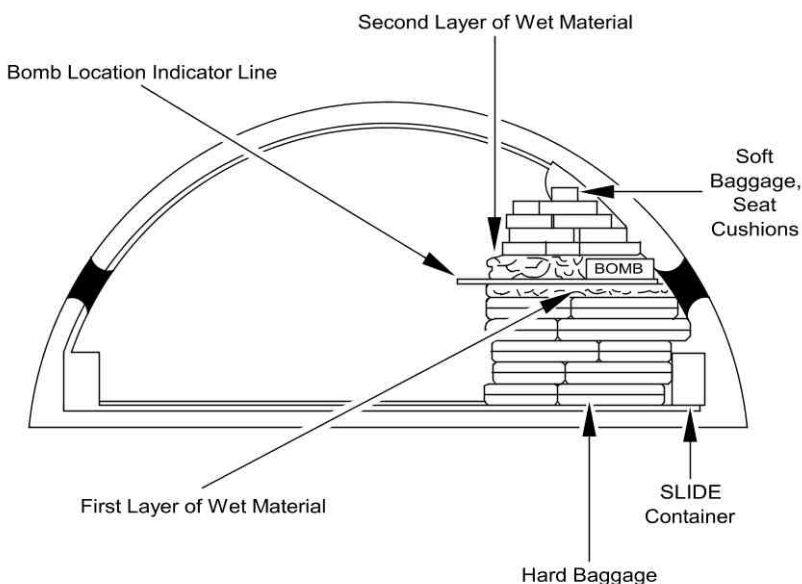
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



### **PASSENGERS.....MOVE/ADVISE**

*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*


### **CABIN CREW..... NOTIFY COCKPIT CREW**

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*

### **EVACUATION/DISEMBARKATION.....EXECUTE**

*Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".*

*Use all available airport facilities to disembark without delay.*

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## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALLEY.....OFF

LDG ELEV..... SELECT 00

BARO..... SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU)..... DISCH

EVACUATION..... INITIATE



## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### PREPARATION

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR..... OFF

SIGNS..... ON

GALLEY..... OFF

LDG ELEV..... SET

BARO..... SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

### APPROACH

RAM AIR..... ON

L/G lever..... DOWN

SLATS AND FLAPS..... MAX AVAIL

GND SPLR..... ARM

MAX BRK PR..... 1 000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

#### ● When aircraft has stopped:

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ If Evacuation required:

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)		
<div>■ If Evacuation not required: CABIN CREW and PASSENGERS (PA)..... NOTIFY</div>		



## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS..... ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*

### WHEN DESCENT ESTABLISHED


EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

#### CAUTION

*Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: *The recommendation is to descend with the autopilot engaged.  
Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.  
Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown

REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								





## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note: In case of lack of pitch down authority, reducing thrust may be necessary.

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF



## VOLCANIC ASH ENCOUNTER

● **If the aircraft enters a volcanic ash cloud:**

180 ° TURN..... INITIATE  
ATC..... NOTIFY  
A/THR..... OFF  
THRUST (conditions permitting).....REDUCE  
CREW OXYGEN MASKS.....ON/100 %/EMER  
CABIN CREW.....NOTIFY  
PASSENGER OXYGEN.....AS RQRD  
ENG ANTI ICE..... ON  
WING ANTI ICE..... ON  
PACK FLOW..... HI

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

APU..... START  
ENGINE PARAMETERS..... MONITOR  
AIRSPEED INDICATIONS.....MONITOR

If airspeed is unreliable or lost, Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... FULL UP

Due to the increased noise level, pay particular attention to visual warnings.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ At takeoff

#### ■ If before V1

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ If after V1

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA..... SET OR CONFIRM  
 AP (if engaged)..... KEEP  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

**DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.**

**CLOSELY MONITOR FLIGHT PATH AND SPEED.**

**RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.**

<b>WINDSHIELD/WINDOW ARCING</b>
---------------------------------

Affected WINDOW/WINDSHIELD ANTI ICE C/B..... PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)

## WINDSHIELD/WINDOW CRACKED

DIAGNOSIS OF INNER PLY.....PERFORM  
*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL..... 230/MEA

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note:    *The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.*

CAB PRESS MODE SEL..... MAN

MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**

CAB PRESS MODE SEL..... AUTO

Note:    *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

CAB PRESS MODE SEL..... MAN

MAN V/S CTL..... FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

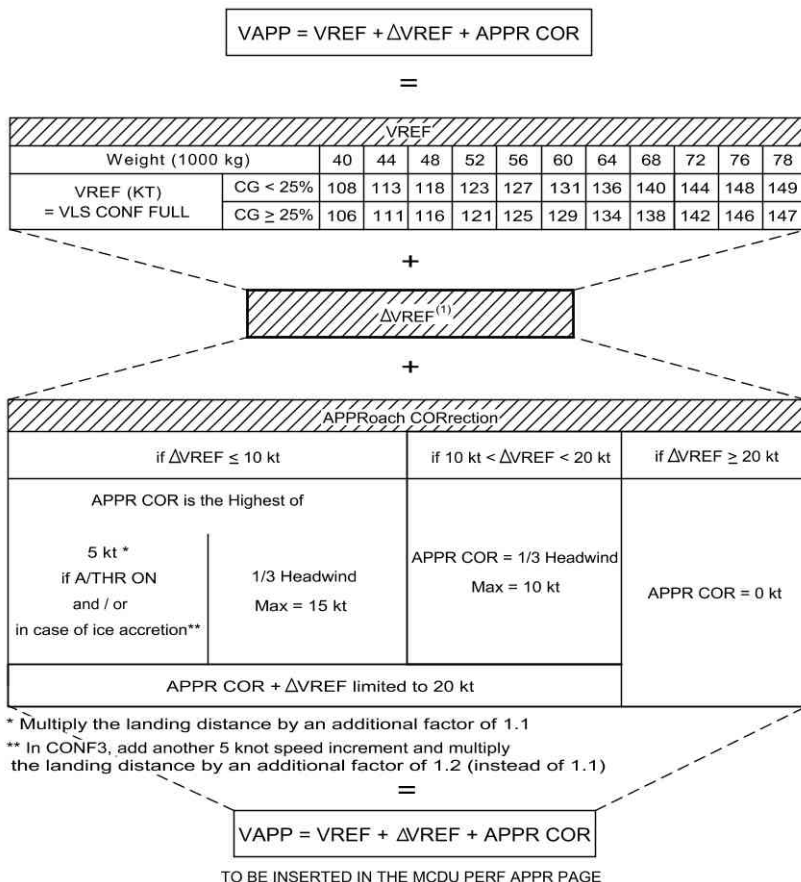


**ECAM ADVISORY CONDITIONS**

SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <b>ENG</b> OIL LO PR warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> <p>In both cases, monitor other engine parameters, especially oil temperature and oil quantity.</p>
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	<p>An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.</p> <p><u>Note:</u> If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</p> <p>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</p> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).

## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



\* Multiply the landing distance by an additional factor of 1.1

\*\* In CONF3, add another 5 knot speed increment and multiply the landing distance by an additional factor of 1.2 (instead of 1.1)

(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:

Failure : ALTN LAW  
 Flight Conditions : Autothrust ON, ice accretion  
 Landing Configuration : CONF 3  
 Headwind : 12 kt  
 Landing Weight/CG : 48 t/25 %  
 VREF determined from the landing weight : 116 kt  
 VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt


As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- 5+5 = 10 kt (ice accretion and landing in CONF 3)
- 1/3 Headwind = 12 kt/3 = 4 kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136$  kt



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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors** “WITHOUT REV” when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors** “WITH REV” when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:     *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
RESULT	3	10			1.40×1.90×1.1=3.00

VREF = 131 kt. Therefore VAPP = 131 + 10 + 5 = 146 kt.

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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt



**LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY**

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



*Continued from the previous page*

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.



**LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY**

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
	IR 1+2+3 FAULT	3	10	1.85	1.85
NAV	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.40*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.00* 1.35*	1.90* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)



**LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY**

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*



*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
	IR 1+2+3 FAULT	3	10	1.45	1.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.35*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK / X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.




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## TRIPPED C/B RE-ENGAGEMENT

In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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### COMPUTER RESET

When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor.

The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
----------------	-----------------------------------------------------------------------------------

Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.



<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
22	AUTO FLT FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE LAV + CRG DET FAULT	SDCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table border="1"><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table border="1"><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table border="1"><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><b>Note:</b></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the 3 C/B:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li><li>• Channel 1 and 2 (L26 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the 3 C/B.</li></ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		





*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><b>Note:</b> After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><b>Note:</b> After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><b>Note:</b> After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1: <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2: <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>
34	<u>NAV</u> TCAS FAULT	TCAS	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
46	ATSU Malfunction	ATSU	<p>An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.</p> <p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>



# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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**LOW TEMPERATURE ALTIMETRY**

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

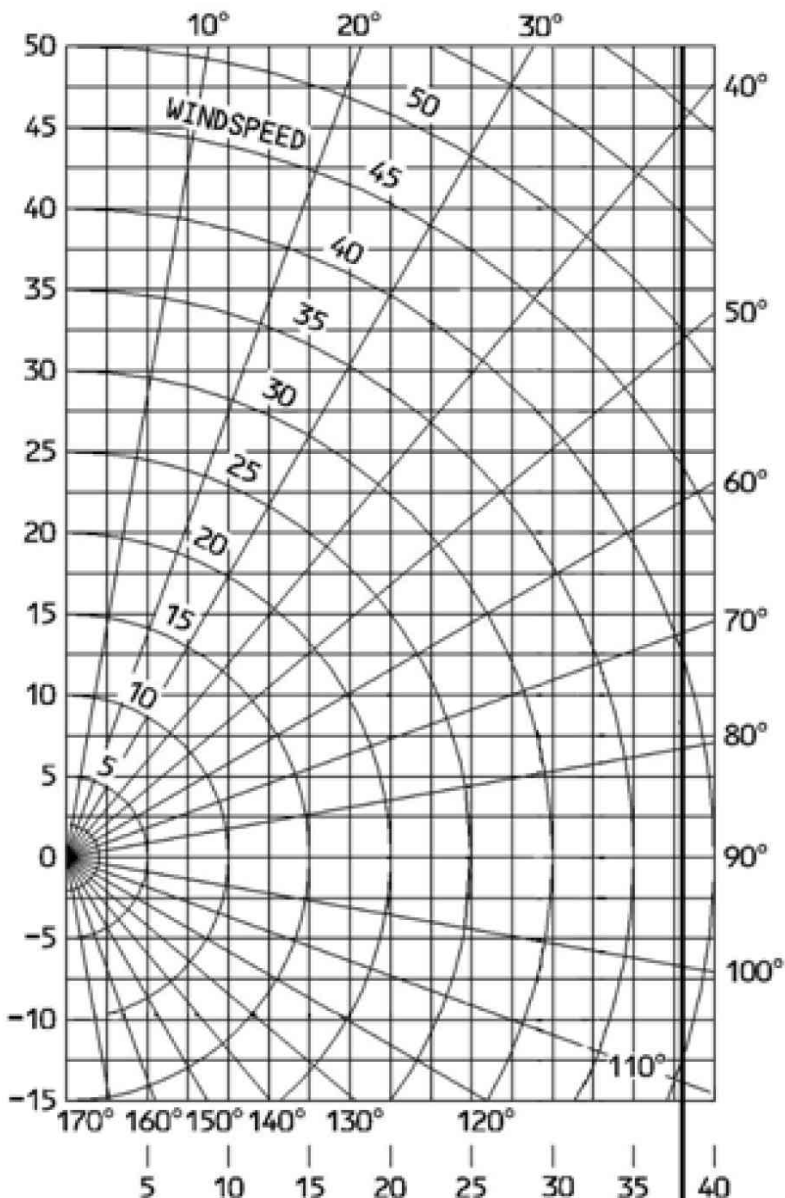
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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1		S < 1		02	AUTO BRK FAULT		02
			S ≥ 1	03				
	1 ≤ FLAPS < 2		S < 1	04	NAV	IR 1+2+3 FAULT		01
			S ≥ 1	05		UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02
	2 ≤ FLAPS < 3		S < 1	06		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT		03
			S ≥ 1	07				
	FLAP = 3		S < 1	08	BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01
			1 ≤ S ≤ 3	09				
			S > 3	10				
	FLAP > 3		S < 1	11	ENG	REV UNLOCK with buffet (CONF 1)		01
			1 ≤ S ≤ 3	12		REV UNLOCK with buffet (CONF 3)		02
			S > 3	13		SHUTDOWN with ENG FIRE pb pushed and ice accretion		03
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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**IN FLIGHT PERFORMANCE**

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**FPE-SPD Speeds**

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**SPEEDS**

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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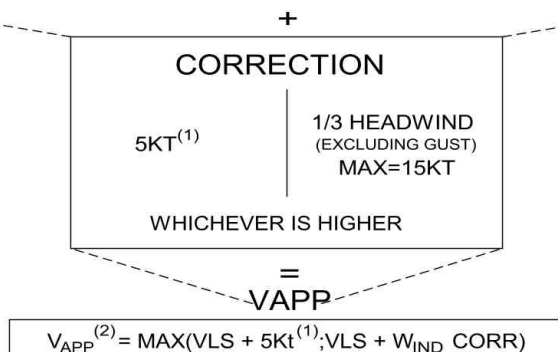
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

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LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %	+16 %	+24 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+3 %
2 reversers operative	-5 %	-12 %	-15 %	-14 %	-12 %	-27 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note:    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 × 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 × 1.06 × 1.08 = 1 020 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

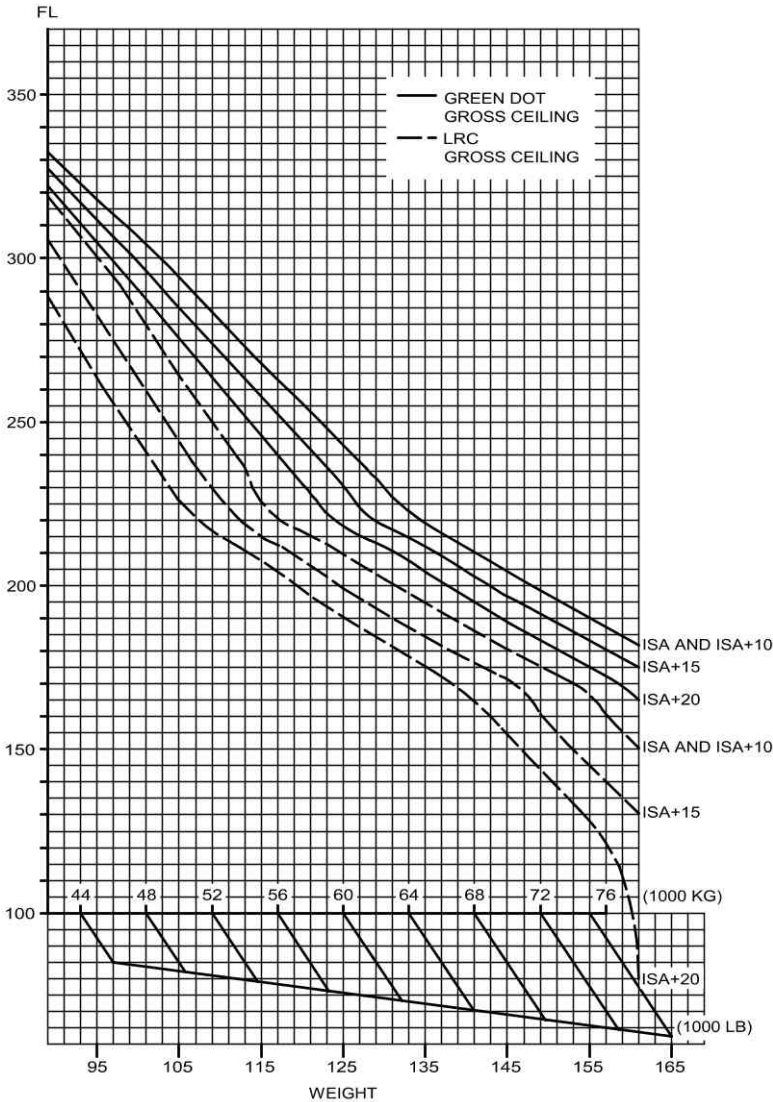
ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

CEILINGS

ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT											
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)			
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)			
ANTI ICE OFF								LEVEL OFF (FT)			
INIT. GW	INITIAL FLIGHT LEVEL										
(1000KG)	250	290	310	330	350	370	390				
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200				
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300				
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200				
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200				
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600				
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100				
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800				
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400				
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100				
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600				
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000					
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400					
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800					
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200					
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600						
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON					
FUEL		+ 14 %				+ 28 %					
TIME		+ 13 %				+ 26 %					
DISTANCE		+ 12 %				+ 23 %					
LEVEL OFF		- 700 ft				- 1800 ft					



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b>
		30 MAR 12

## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)	MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584	
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241	
<b>52</b>	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594	
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246	
<b>54</b>	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602	
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249	
<b>56</b>	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600	
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248	
<b>58</b>	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585	
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242	
<b>60</b>	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562	
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232	
<b>62</b>	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570		
	2434 285	2287 272	2225 266	2248 268	2055 246		
<b>64</b>	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544		
	2454 284	2382 279	2317 272	2272 267	2037 234		
<b>66</b>	1.243 .513	1.322 .556	1.397 .591	1.421 .585			
	2476 284	2432 281	2399 277	2264 263			
<b>68</b>	1.247 .512	1.330 .558	1.412 .599	1.426 .570			
	2499 283	2472 282	2473 280	2253 256			
<b>70</b>	1.254 .514	1.338 .560	1.426 .604	1.436 .543			
	2550 285	2516 283	2537 283	2232 243			
<b>72</b>	1.262 .517	1.351 .567	1.428 .598				
	2604 287	2592 286	2533 280				
<b>74</b>	1.270 .521	1.365 .575	1.432 .587				
	2666 289	2673 290	2523 274				
<b>76</b>	1.290 .539	1.381 .585	1.438 .571				
	2805 299	2767 296	2509 267				
<b>78</b>	1.308 .554	1.395 .593	1.450 .537				
	2927 307	2850 300	2478 250				
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %			

IN CRUISE QUICK CHECK LONG RANGE

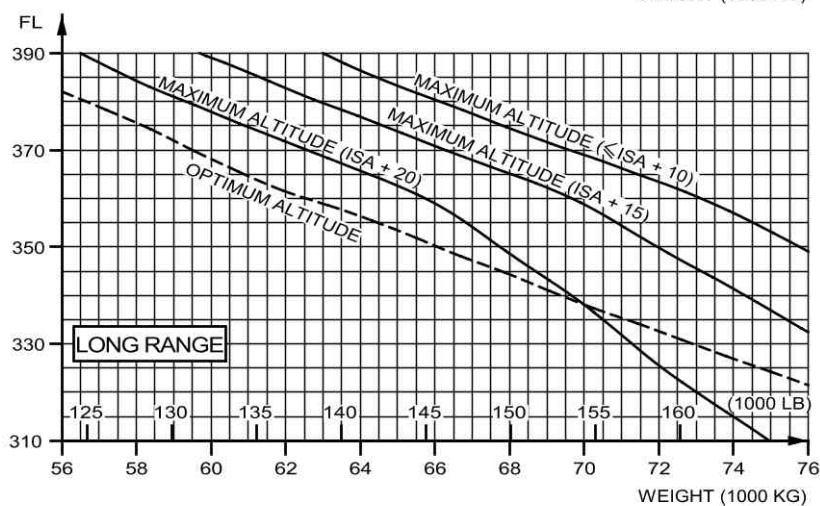
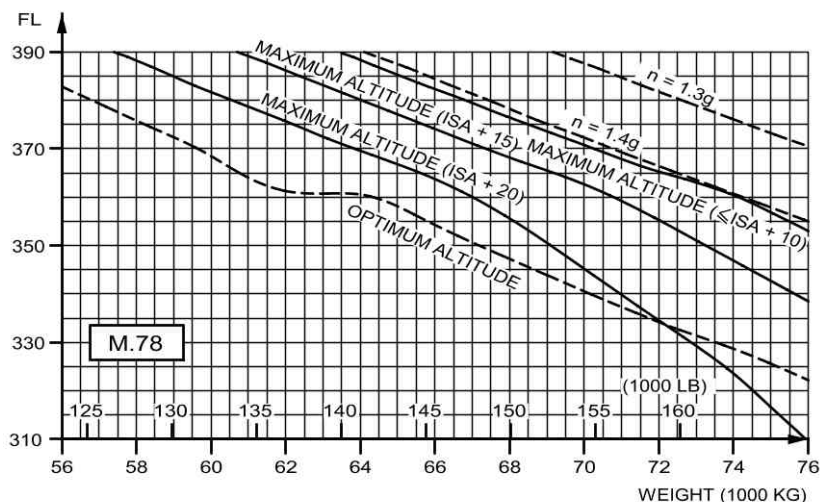
ONE ENGINE OUT

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG				ISA		FUEL CONSUMED (KG)			
PACK FLOW HI				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %				TOTAL ANTI ICE ON △FUEL = + 6 %					



## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-AEO</b> <b>2/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

### ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
							TIME (H.MIN)		
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	290	310	330	350	370	390	(KG/1000KG)		
	FL290	FL330	FL370				FL290	FL330	FL370
	FL310	FL350	FL390						
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING ΔFUEL = - 0.4 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %			TOTAL ANTI ICE ON ΔFUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP

CL-NQ-04-10-140

## COST INDEX FOR LONG RANGE CRUISE SPEED

### ALL ENGINES

For a quick determination of the  $CI_{LRC}$ , use:

- $CI_{LRC} = 40$  kg/min in the FMGC.
- or
- $CI_{LRC} = 55$  (100 lb/h) in the FMGC.



## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									
	45				65				
	TIME	FUEL	DIST.	EPR	TIME	FUEL	DIST.	EPR	IAS (KT)
FL	(MIN)	(KG)	(NM)		(MIN)	(KG)	(NM)		
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140



ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT										
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE										
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)										
REF. LDG WT AT DEST. = 55000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)				
AIR DIST. (NM)		FLIGHT LEVEL					CORRECTION ON FUEL CONSUMPTION (KG/1000KG)			
		100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12							2		
60	681 0.16							4		
80	832 0.20	803 0.20						5		
100	984 0.24	943 0.24	939 0.22					6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25				7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28				9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31			10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33		11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36		13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39		14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42		15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45		17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48		18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51		19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53		21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56		22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59		23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02		25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05		26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08		27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11		29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13		30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16		31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19		33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON				
△FUEL = - 1 %			△FUEL = + 3 %			△FUEL = + 7 %				

CL-NO-04-13-140



# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING ANTI-ICING OFF		ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46
260	1870 1.03	1936 1.00	2004 0.99	2074 0.97	2148 0.95	2222 0.92	2277 0.90
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.98	2396 0.95	2456 0.93
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.99	2634 0.96
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.99
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35
AIR CONDITIONING OFF △FUEL = - 1.5 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 6 %		

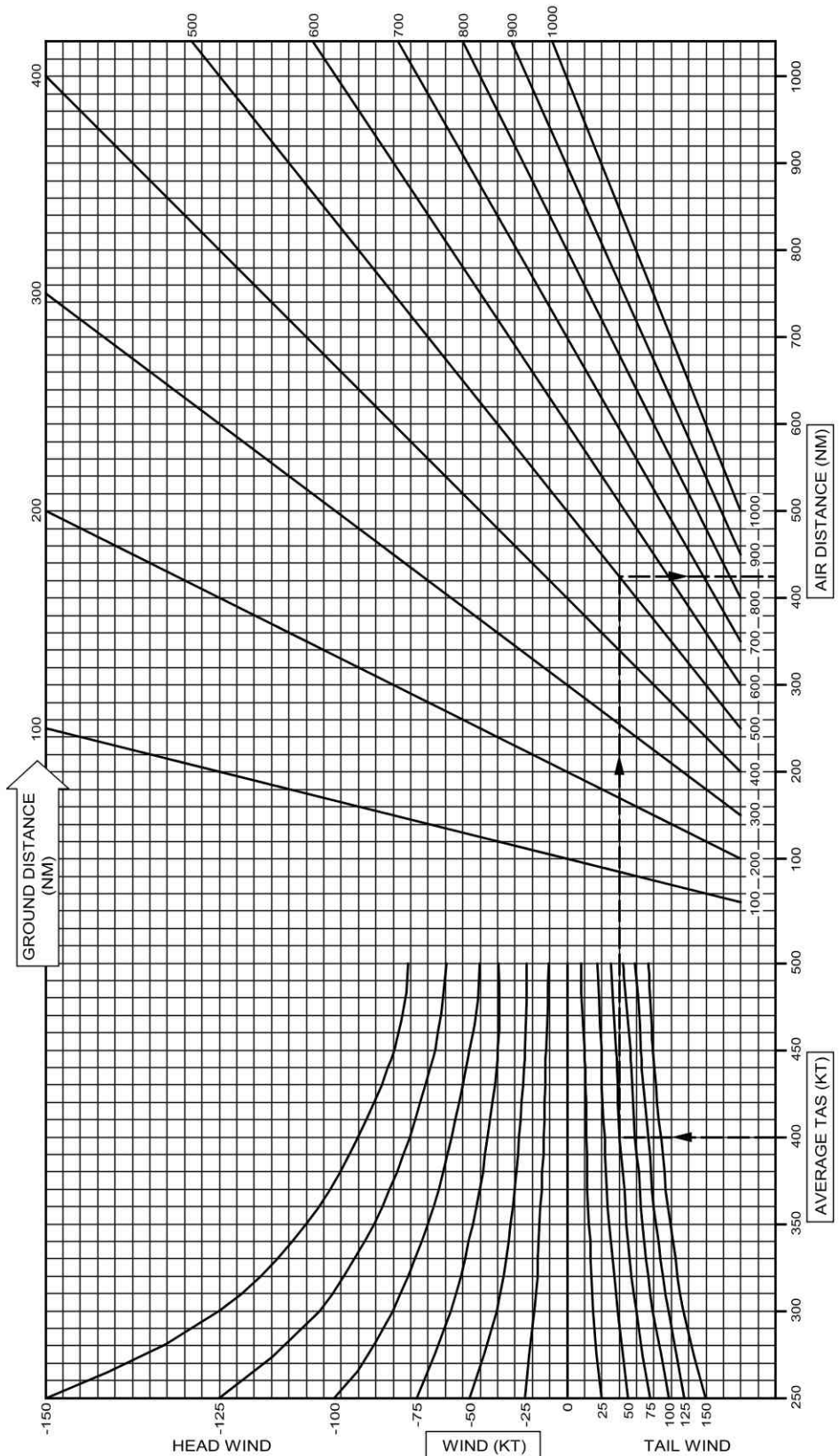
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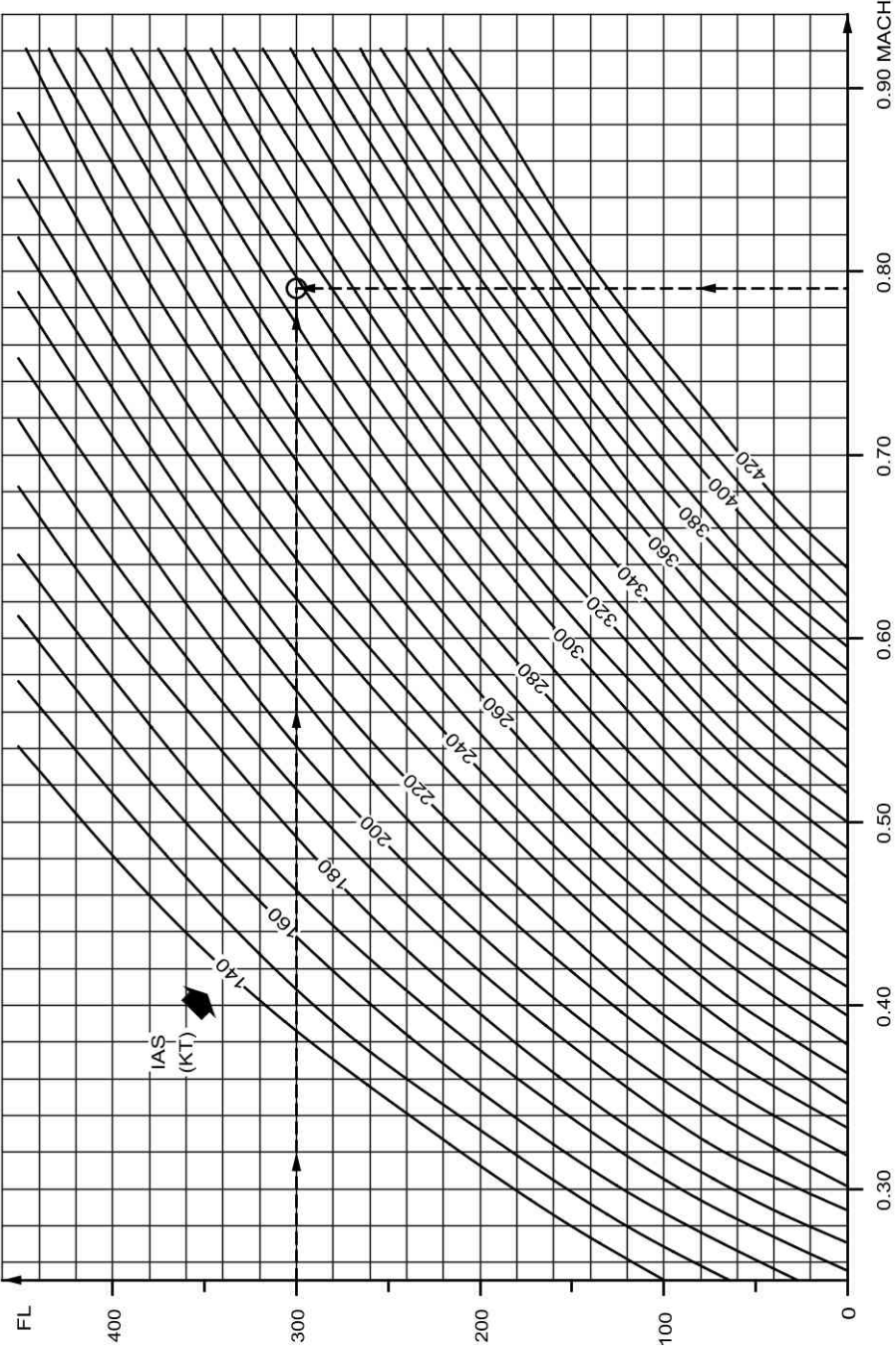




## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

FPF (HYD G SYS LO PR) = 10 %

FPF (INOP SYS: L AIL) = 8 %

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x (10 % + 8 %)

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x 8 %

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT	L/G DOOR	All landing gears doors are extended	15 %
	DOORS NOT CLOSED			

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**Hydraulic Architecture..... OPS.02**

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**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

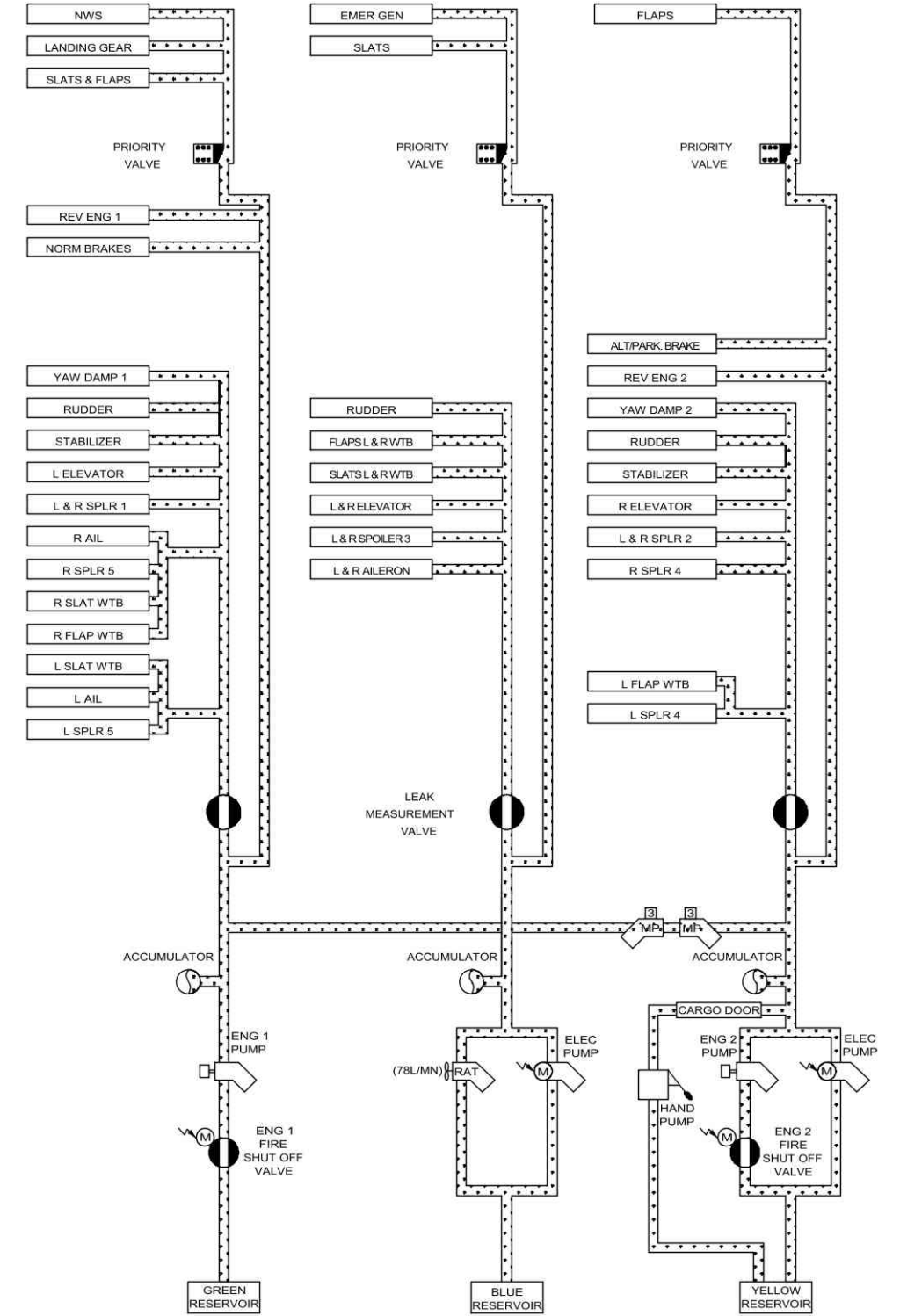
FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

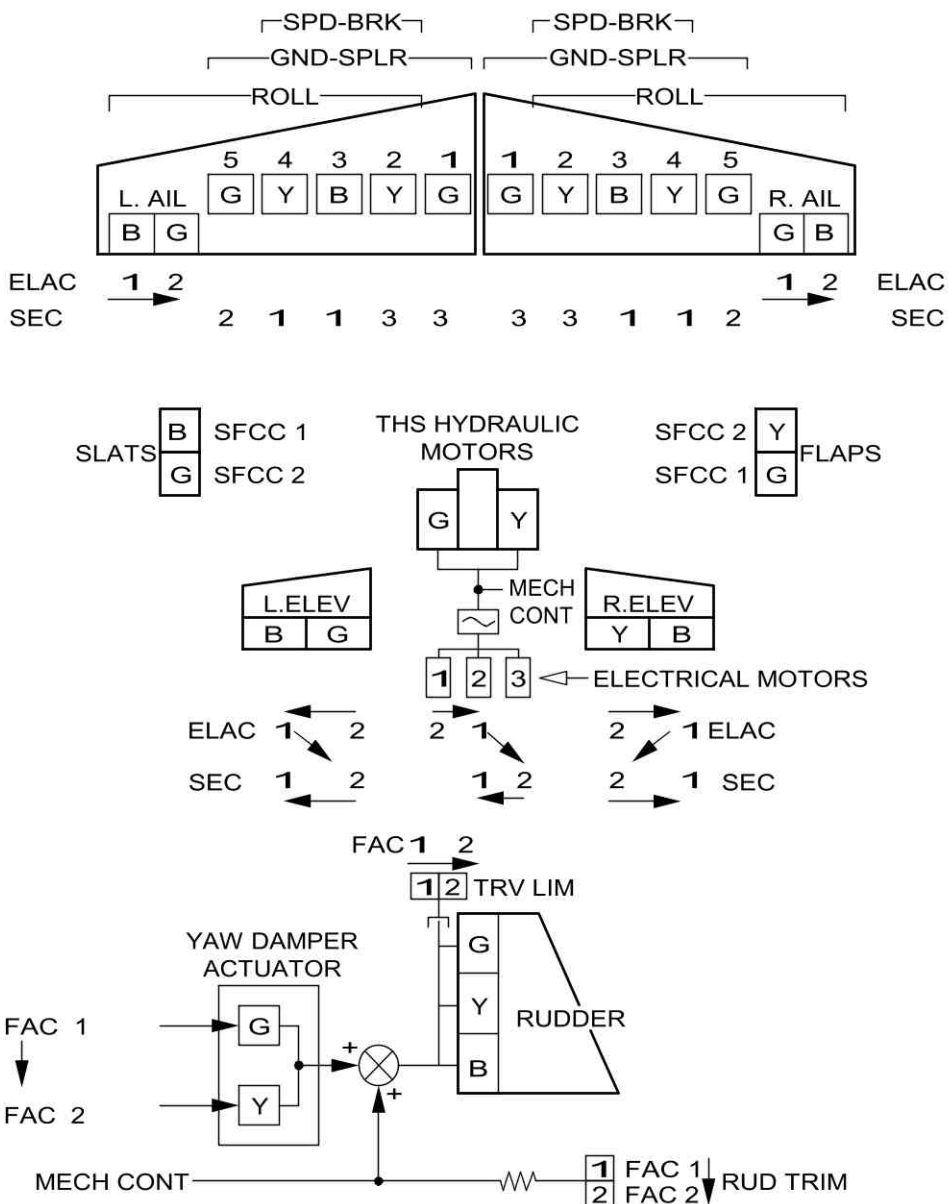
● **FOR APPROACH:**

A/THR in managed speed.....USE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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**OEBPROC-PLP PRELIMINARY PAGES**

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**OEBPROC-11 "ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight**

**"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight.. 11.00**  
**"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight.. 11.01**

**OEBPROC-30 No SRS Engagement During Go Around Below MDA**

**No SRS Engagement During Go Around Below MDA..... 30.00**  
**No SRS Engagement During Go Around Below MDA..... 30.01**

**OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

**Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....31.00**  
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**OEBPROC-38 Erroneous Radio Altimeter Height Indication**

**Erroneous Radio Altimeter Height Indication..... 38.00**  
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**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**


**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.00**  
**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.01**

**OEBPROC-43 F/CTL SPOILER FAULT**

**F/CTL SPOILER FAULT..... 43.00**  
**F/CTL SPOILER FAULT..... 43.01**

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

**L/G GEAR NOT DOWNLOCKED..... 44.00**  
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## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an **ENG 1(2) OIL FILTER CLOG** ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSE					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSE					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side).....OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side).....OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED.....OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER.....IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note:     *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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# OEB30 Issue 1.0

## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.


**Reason for issue:** This OEB replaces the A320 OEB 188.  
 One Operator reported a case where the flight crew initiated a Go Around slightly below the Minimum Descent Altitude (MDA), and the aircraft did not pitch up as expected. The flight crew performed a non precision approach (a VORDME approach) using the FINAL APP managed guidance mode with the AP1 (Autopilot) engaged during the final approach.  
 This OEB is issued to provide flight crews with an operational procedure to avoid such aircraft behavior.  
 The operational procedure provided in this OEB applies to all Non Precision Approaches, for both conventional approaches and RNAV approaches, flown in FINAL APP managed guidance mode.

**Applicable to:** All A318/A319/A320/A321 aircraft

**Cancelled by:** Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.  
 Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013526.0002001	30 MAR 12
Criteria: SA Applicable to: B-HSE					
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013527.0002001	30 MAR 12
Criteria: SA Applicable to: B-HSE					





## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

### ECAM ENTRY

None

### PROCEDURE

During a non precision approach, when using the FINAL APP managed guidance mode:

- **At DA(DH) or MDA(MDH), or earlier in approach if visual conditions are obtained:**

DISENGAGE the FINAL APP mode by pressing the APPR pushbutton on the FCU.

When the flight crew presses the APPR pb in order to disengage the FINAL APP managed guidance mode, a basic vertical guidance mode, either V/S or FPA, engages.

This ensures that the SRS and GA TRK guidance modes correctly engage, if the flight crew initiates a go-around slightly below MDA (MDH).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSE				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSE				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSE				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSE				





## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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 <div>DRAGONAIR</div> <div><b>A320/A321</b></div> <div>QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSE				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSE				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



# AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

- If Wing Anti-Ice is ON
  - If both PACKS are ON  
 PACK (affected bleed side).....OFF  
 X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE  
*Consider reducing the bleed air demand, by, depending on the flight conditions:*
  - Switching OFF the remaining pack (if aircraft's altitude permits), or
  - Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

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## OEB43 Issue 2.0

### F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSE				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSE				





## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF  
*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10  
*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED  
*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above  $V_{FE_{NEXT}}$ , the flight crew should deselect A/THR, decelerate to  $V_{FE_{NEXT}}$ , and select CONF 1 when below  $V_{FE_{NEXT}}$ . When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>44.00</b> 30 MAR 12
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## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSE				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSE				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

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		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSG**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSG</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HSG</b>				
	OEB30 issue 1.0	W	N	30 MAR 12	No SRS Engagement During Go Around Below MDA
	Criteria: SA <b>Applicable to: B-HSG</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSG</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSG</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSG</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSG</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-30	No SRS Engagement During Go Around Below MDA	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSG</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

<b>M<sup>(1)</sup></b>	<b>MSN</b>	<b>FSN</b>	<b>Registration Number</b>	<b>Model</b>
	0812	HDA 0001	B-HSG	320-232

(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTPC36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	27-1189 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L94 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	27-1182 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L93 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	<b>Applicable to: ALL</b>			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	<b>Applicable to: ALL</b>			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	<b>Applicable to: ALL</b>			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	<b>Applicable to: ALL</b>			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	<b>Applicable to: ALL</b>			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	<b>Applicable to: ALL</b>			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	<b>Applicable to: ALL</b>			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	<b>Applicable to: ALL</b>			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF RAIN REPELLENT SYSTEM
	<b>Applicable to: ALL</b>			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	<b>Applicable to: ALL</b>			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	<b>Applicable to: ALL</b>			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	<b>Applicable to: ALL</b>			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	<b>Applicable to: ALL</b>			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			




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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			


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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	<b>Applicable to: ALL</b>			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	<b>Applicable to: ALL</b>			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	<b>Applicable to: ALL</b>			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	<b>Applicable to: ALL</b>			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	<b>Applicable to: ALL</b>			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	<b>Applicable to: ALL</b>			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	<b>Applicable to: ALL</b>			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	<b>Applicable to: ALL</b>			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	<b>Applicable to: ALL</b>			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	<b>Applicable to: ALL</b>			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	<b>Applicable to: ALL</b>			
	31-1141 04		30 AUG 10	INDICATING/RECORDING SYSTEMS - FWS - INTRODUCE FWC STANDARD H1P-E3P.
	<b>Applicable to: ALL</b>			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	<b>Applicable to: ALL</b>			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	<b>Applicable to: ALL</b>			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	<b>Applicable to: ALL</b>			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	<b>Applicable to: ALL</b>			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			

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	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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**GEN-PLP PRELIMINARY PAGES**

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

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## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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## CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

**CAUTION**

Check that  $\Delta P$  is zero before opening the doors.

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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The “CAB PR LDG ELEV FAULT” message is displayed on the ECAM
- A “MAP NOT AVAIL” message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.


Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>
---------------------------------------

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



*Continued from the previous page*

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

<sup>(a)</sup> Restored, when speed is below 100 kt.

<sup>(b)</sup> Crew oxygen valve inoperative.

<sup>(c)</sup> Lost, when speed is below 50 kt.


<sup>(d)</sup> Lost 30 s after last engine shutdown.

<sup>(e)</sup> IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

<sup>(f)</sup> For APU start only.

<sup>(g)</sup> Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.



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<b>ELEC EMER CONFIG SUMMARY</b>
---------------------------------

CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● <b>AT 1000 FT AGL:</b> L/G..... DOWN ● <b>When L/G down: BATTERIES ONLY, USE MAN PITCH TRIM</b>

LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>

GO-AROUND
● <b>When L/G uplocked:</b> EMER ELEC PWR.....MAN ON

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
DRY Runway	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

FLT ON BAT ONLY

Flight time on batteries only may be increased to at least 30 min as follows:

ENG MODE SEL..... NORM

ANTI ICE PITOT 1 C/B (D02)..... PULL

26 V ADIRU 1 C/B (F07).....PULL

*CM 1 altitude, speed, and vertical speed indication on PFD are lost. Use standby instruments*

● **7 min before landing:**

ANTI ICE PITOT 1 C/B (D02)..... RESET

● **After 1 min:**

<b>CAUTION</b>	This time delay is necessary to ensure reliable speed information even in icing conditions when the ADIRU is reset to ON.
----------------	---------------------------------------------------------------------------------------------------------------------------

26 V ADIRU 1 C/B (F07).....RESET

COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
 In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT.....

ON
- If fuel vapors:
 

CAB FANS.....

ON

PACK 1+2.....

OFF
- If no fuel vapors:
 

CAB FANS.....

OFF

PACK FLOW.....

HI
- LDG ELEV.....

10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude).....

INITIATE
- ATC.....

NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC.....

CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.
- At FL 100 OR MEA:
 

APU MASTER SW (if in ELEC EMER CONFIG)...

ON

PACK 1+2.....

OFF

MODE SEL.....

MAN

MAN V/S CTL.....

FULL UP

RAM AIR.....

ON

APU MASTER SW.....

OFF
- If smoke persists, open CKPT window:
 

MAX SPEED.....

200 KT

COCKPIT DOOR.....

OPEN

HEADSETS.....

ON

PNF COCKPIT WINDOW.....

OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE



## SMOKE/FUMES/AVNCS SMOKE

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALLEY..... OFF

SIGNS..... ON

CKPT/CABIN COM..... ESTABLISH

● **IF REQUIRED:**

CREW OXY MASKS..... ON/100%/EMER

● **IF SMOKE SOURCE IMMEDIATELY OBVIOUS,  
ACCESSIBLE, AND EXTINGUISHABLE:**

FAULTY EQPT..... ISOLATE

● **IF SMOKE SOURCE NOT IMMEDIATELY  
ISOLATED:**

DIVERSION..... INITIATE

DESCENT (FL 100 or MEA, or minimum obstacle  
clearance altitude)..... INITIATE

● **AT ANY TIME of the procedure, if SMOKE/FUMES  
becomes the GREATEST THREAT :**

SMOKE/FUMES REMOVAL..... CONSIDER

ELEC EMER CONFIG..... CONSIDER

*Refer to the end of the procedure to set ELEC  
EMER CONFIG*

● **At ANY TIME of the procedure, if situation  
becomes UNMANAGEABLE :**

IMMEDIATE LANDING..... CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

● **IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 PACK 1..... OFF

● **If smoke continues:**

PACK 1..... ON  
 PACK 2..... OFF

● **If smoke still continues:**

PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

● **IF CAB EQUIPMENT SMOKE SUSPECTED:**

● **If smoke continues:**

EMER EXIT LIGHT..... ON  
 BUS TIE..... OFF  
 GEN 2..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE

● **If smoke still continues or if faulty  
equipment confirmed isolated:**

GEN 2..... ON  
 BUS TIE..... AUTO

● **If faulty equipment not confirmed isolated,  
before L/G extension:**

GEN 2..... ON







## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

BUS TIE.....AUTO

SMOKE/FUMES REMOVAL..... CONSIDER

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER

- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF

EMER ELEC PWR..... MAN ON

- WHEN EMER GEN AVAIL:

APU GEN.....OFF

GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- AT 3 min OR 2 000 ft AAL BEFORE LANDING:  
GEN 2..... ON  
EMER ELEC GEN 1 LINE..... ON

- WHEN A/C IS STOPPED:

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt

Note:


- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED

Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	200 kt		200 kt	185 kt	177 kt	
S > 3	177 kt		177 kt	177 kt	177 kt	

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM  
CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

- **IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV  
*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

- **IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3  
*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP



FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON

- **On the lighter side and in the center tank:**  
FUEL PUMPS.....OFF
- **When fuel is balanced:**  
FUEL PUMPS (WING + CTR)..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.


FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



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**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*
- **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**  
 CTR TK PUMP 1+2..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147


APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75								
<b>CONTA runway (CONF 3)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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### HYD G + Y SYS LO PR SUMMARY

CRUISE											
MAX SPD.....											320/0.77
MANEUVER WITH CARE											
ALTN LAW : PROT LOST											
LANDING CONF						APPROACH SPEED					
Use FLAP 3						VAPP = VREF + 25 kt					

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH											
CAT 2 INOP											
SLATS SLOW / FLAPS JAMMED											
GPWS FLAP MODE.....											OFF
<b>● For Flaps extension:</b> SPD SEL..... VFE NEXT - 5KT											
When in landing CONF : DECELERATE TO CALCULATED VAPP											
Stabilize at VAPP before L/G down, to be trimmed for approach.											
L/G GRAVITY EXTENSION											

LANDING											
<b>FLARE:</b> PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law											
<b>SPOILERS:</b> Only 1 per wing											
<b>NO REVERSER</b>											
<b>BRAKING:</b> BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI											
<b>NO NOSEWHEEL STEERING</b>											

GO-AROUND											
NO GEAR RETRACTION. Increased fuel consumption											
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt											
<b>● For diversion:</b>											
<b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds											
<b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt											

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10								
CORRECTIONS	+ 1 000 ft above SL				+ 10 kt tailwind				
DRY runway	+ 3 %				+ 18 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:*     *The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*





## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <u>WHEEL</u> SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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**PREPARATION**

- CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF  
*Consider fuel reduction to a safe minimum.*
- **If NOSE L/G abnormal:**  
 CG location (if possible).....AFT
    - 10 passengers from front to rear moves the CG roughly 4 % aft.
    - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.
  - **If one MAIN L/G abnormal:**  
 FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*
- OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

**APPROACH**

- GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI
- **If one or both MAIN L/G abnormal:**  
 GROUND SPOILERS.....DO NOT ARM

**BEFORE LANDING**

- RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER
- **If the external light condition is poor at landing:**  
 DOME LT.....DIM

**FLARE, TOUCH DOWN AND ROLL OUT**

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.





## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW

### (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT



ADR 1 + 2 + 3 FAULT (Cont'd)


● DURING FINAL APPR

V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*

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**NAV FM / GPS POS DISAGREE**

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 ° ,
- 0.9 min for latitudes at or above 55 ° and below 70 ° ,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

● **If the message occurs during ILS/LOC approach (LOC green):**

DISREGARD it.

● **If the message occurs in climb, cruise, or descent:**

CHECK navigation accuracy, using raw data.

■ **If the check is positive:**

NAV mode and ND ARC/ROSE NAV may be used.

■ **If the check is negative:**

HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

■ **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**

Use the associated FD/AP.

■ **If not:**

Deselect GPS and revert to basic information.

● **If the message occurs during a Non Precision Approach (NPA):**

■ **Overlay approach:**

SELECT HDG, or TRK, and use raw data.

■ **GPS or RNAV approach:**

GO AROUND, or fly visual, if visual conditions are met.





## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.

During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
 ALIGN light on during 30 s.  
 ATT MODE displayed on CDU.
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

- If “H” is written on the “5” key:
 

H KEY..... PRESS  
 Degree marker, 0 decimal point, ENT and CLR lights come on.

A/C HEADING..... ENTER
- If “H” is not written on the “5” key:
 

A/C HEADING..... ENTER  
 Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.  
 Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.  
 Heading will be displayed on the associated ND.  
 “HDG-ATT MODE” will be displayed on CDU.

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s).....OFF  
 REMAINING AIR DATA.....CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR.....KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs.....OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF.....USE FLAP 3

APP SPD.....VLS +10

LDG DIST PROC.....APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST.....CLB

FLAPS.....RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	250 kt	10.0/CLB	10.5/CLB	11.5/CLB
FL 50 - FL 100		9.0/CLB	9.5/CLB	10.0/CLB
FL 100 - FL 150		8.0/CLB	8.5/CLB	8.5/CLB
FL 150 - FL 200		7.0/CLB	7.0/CLB	7.0/CLB
FL 200 - FL 250	275 kt	5.0/CLB	5.0/CLB	5.0/CLB
FL 250 - FL 320		4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200-FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320-FL 200	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE
FL 200 - FL 100	250 kt	1.5/IDLE	0.5/IDLE	-0.5/IDLE
Below FL 100	250 kt	1.0/IDLE	0.0/IDLE	-1.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.5/IDLE	2.5/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 67 t	67 t - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.5/55.7	5.5/51.5	6.0/47.3
1	S	7.5/58.2	7.5/54.0	7.5/49.0
1+F <sup>(1)</sup>	S	4.5/60.2	4.5/56.1	4.5/51.2
2	F	9.0/61.7	9.0/57.3	9.0/52.8



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	7.5/67.2	7.5/62.7	7.5/57.9

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

### FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 67 t	67 t - 55 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	4.5/48.0	4.5/44.4	4.5/41.4

**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

##### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

##### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :
  - X BLEED..... CHECK OPEN DESCENT TO FL200/MEA.....CONTINUE
  - Descend rapidly to FL 200, to recover the bleed supply from the APU*
  - APU.....START
  - Start the APU during the descent.*
  - AT, OR BELOW, FL200 :
    - WING A.ICE..... OFF
    - APU BLEED must not be used for wing anti-ice.*
    - APU BLEED..... ON
    - MAX FL200
    - AVOID ICING CONDITIONS
    - IF ICE ACCRETION
      - APPR SPD.....VLS + 10 KT
      - LDG DIST PROC..... APPLY
      - Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

**ENG DUAL FAILURE - FUEL REMAINING**

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an “ENG DUAL FAILURE” during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*


*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

- **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS..... OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

CREW OXY MASKS (Above FL 100).....ON
- **WHEN APU AVAIL FL < 200:**

WING ANTI ICE..... OFF

APU BLEED..... ON

ENG MASTERS (one at a time)..... OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
GALLEY.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*



## ENG DUAL FAILURE - NO FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THRUST LEVERS..... IDLE  
FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....220 KT/GREEN DOT

*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC..... NOTIFY

CREW OXY MASKS (Above FL 100)..... ON

CABIN AND COCKPIT..... PREPARE

SIGNS..... ON

GALLEY..... OFF

USE RUDDER WITH CARE

### ● WHEN BELOW FL 150

RAM AIR..... ON

## COMMON ACTIONS FOR THE APPROACH

### APPROACH PREPARATION

Note: *Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).*

BARO..... SET

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

## IF FORCED LANDING ANTICIPATED

### APPROACH

FOR LDG.....USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**


ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

  - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT





ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*


## ENG RELIGHT (IN FLIGHT)

MAX ALTITUDE.....See below  
 ENG MASTER (affected).....OFF  
 THR LEVER (affected)..... IDLE  
 ENG MODE SEL..... IGN  
 X BLEED ..... OPEN  
 WING A. ICE (for starter assist).....OFF  
 ENG MASTER (affected)..... ON

*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*

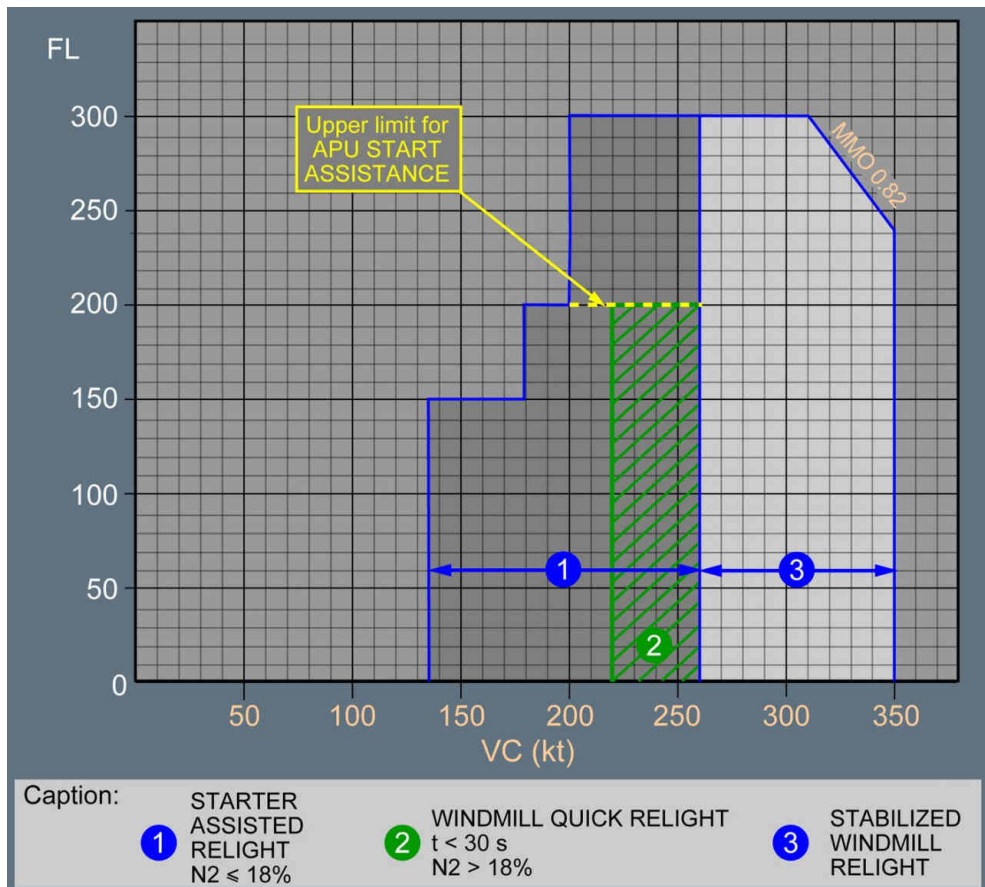
*Engine light up should be achieved within 30 s after fuel flow increases.*

■ **When idle is reached:**

ENG MODE SEL..... NORM  
 TCAS MODE SEL  ..... check TA/RA  
*Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*  
 Affected SYS..... RESTORE

■ **If no relight:**

ENG MASTER (affected)..... OFF  
*Wait 30 s before attempting a new start (to drain the engine).*





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

————— ASSOCIATED PROCEDURES —————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION

External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

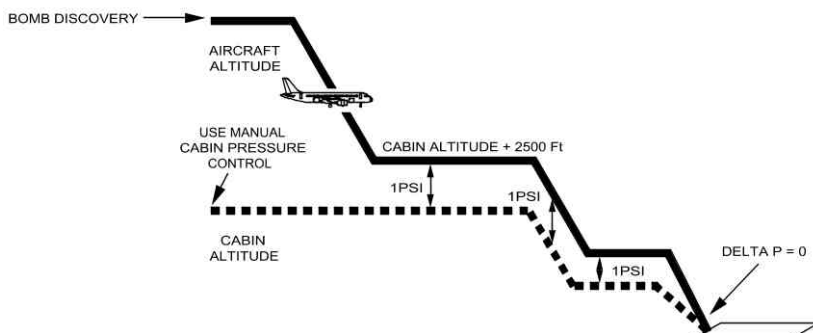
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN





## BOMB ON BOARD (Cont'd)

- **When at CAB ALT+2 500 ft:**
  - 1 PSI DELTA P..... MAINTAIN
  - GALLEY..... OFF
  - FLAPS (fuel permitting)..... AT LEAST CONF 1
  - For landing, use normal configuration.*
  - LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**
  - 1 PSI DELTA P..... MAINTAIN
- **During approach:**
  - CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**
    - EVACUATION..... INITIATE
    - Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**
    - CABIN CREW and PASSENGERS (PA)..... NOTIFY

### **CABIN PROCEDURES**

If a suspect device is found in the cabin:

<b>WARNING</b>	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
<b>WARNING</b>	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
<b>CAUTION</b>	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

**EOD PERSONNEL ON BOARD..... CHECK**

*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

**BOMB..... DO NOT OPEN**

**BOMB..... DO NOT CUT WIRES**

**BOMB..... SECURE AGAINST SLIPPING**

**BOMB..... AVOID SHOCKS**

*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

**PASSENGERS..... LEAD AWAY FROM BOMB**

*Move passengers at least 4 seat rows away from the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*

*Seat backs and tray tables must be in their full upright position.*

*Service items may need to be collected in order to secure tray tables.*

**PORTABLE ELECTRONIC DEVICES..... SWITCH OFF**

*The cabin crews must command passengers to switch off all portable electronic devices.*



## BOMB ON BOARD (Cont'd)

### BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

### EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

### GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

#### ● If the bomb can be moved:

#### RH AFT CABIN DOOR SLIDE.....DISARM

#### LEAST RISK BOMB LOCATION (LRBL).....PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

### BOMB INDICATION LINE.....POSITION

Note: A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

### BOMB.....MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

**CAUTION** Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.

### LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

*Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.*





## BOMB ON BOARD (Cont'd)

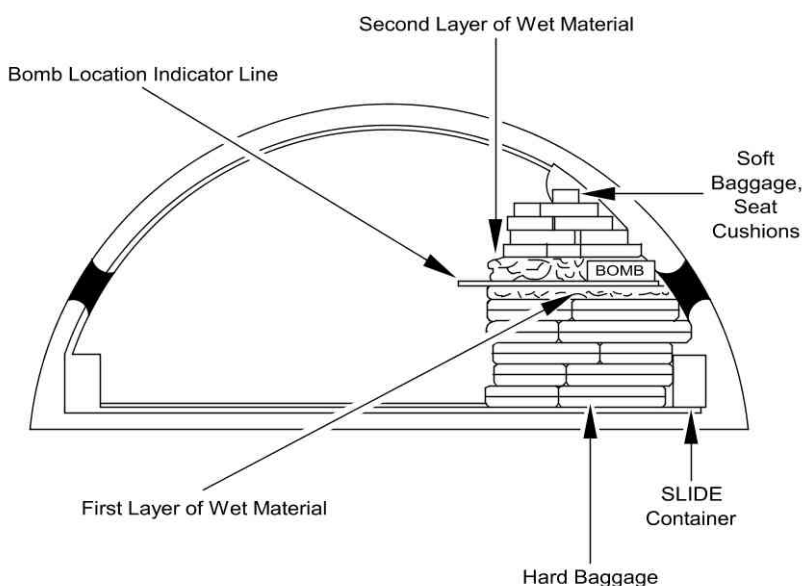
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



### PASSENGERS.....MOVE/ADVISE

*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

### CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*

### EVACUATION/DISEMBARKATION.....EXECUTE

*Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".*

*Use all available airport facilities to disembark without delay.*

## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALLEY.....OFF

LDG ELEV..... SELECT 00

BARO..... SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU)..... DISCH

EVACUATION..... INITIATE



## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### PREPARATION

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR..... OFF

SIGNS..... ON

GALLEY..... OFF

LDG ELEV..... SET

BARO..... SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

### APPROACH

RAM AIR..... ON

L/G lever..... DOWN

SLATS AND FLAPS..... MAX AVAIL

GND SPLR..... ARM

MAX BRK PR..... 1 000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

#### ● When aircraft has stopped:

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ If Evacuation required:

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)		
<div>■ If Evacuation not required: CABIN CREW and PASSENGERS (PA)..... NOTIFY</div>		



## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS..... ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*

### WHEN DESCENT ESTABLISHED


EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

#### CAUTION

*Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: *The recommendation is to descend with the autopilot engaged.  
Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.  
Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown

REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								





## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note: In case of lack of pitch down authority, reducing thrust may be necessary.

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.

**TAILSTRIKE**

In the event of a tailstrike, apply the following procedure:

**LAND ASAP**

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF



## VOLCANIC ASH ENCOUNTER

● **If the aircraft enters a volcanic ash cloud:**

180 ° TURN..... INITIATE  
ATC..... NOTIFY  
A/THR..... OFF  
THRUST (conditions permitting).....REDUCE  
CREW OXYGEN MASKS.....ON/100 %/EMER  
CABIN CREW.....NOTIFY  
PASSENGER OXYGEN.....AS RQRD  
ENG ANTI ICE..... ON  
WING ANTI ICE..... ON  
PACK FLOW..... HI

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

APU..... START  
ENGINE PARAMETERS..... MONITOR  
AIRSPEED INDICATIONS.....MONITOR

If airspeed is unreliable or lost, Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... FULL UP

Due to the increased noise level, pay particular attention to visual warnings.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ At takeoff

#### ■ If before V1

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ If after V1

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA..... SET OR CONFIRM  
 AP (if engaged)..... KEEP  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

**DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.**

**CLOSELY MONITOR FLIGHT PATH AND SPEED.**

**RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.**

WINDSHIELD/WINDOW ARCING

Affected WINDOW/WINDSHIELD ANTI ICE C/B..... PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)

**WINDSHIELD/WINDOW CRACKED**

DIAGNOSIS OF INNER PLY.....PERFORM  
*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation  
*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL..... 230/MEA  
*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain ΔP 5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note:    *The following procedure allows maintaining ΔP 5 PSI in manual cabin pressure mode.*

CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

ΔP = 5 PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**

CAB PRESS MODE SEL..... AUTO

Note:    *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL..... FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

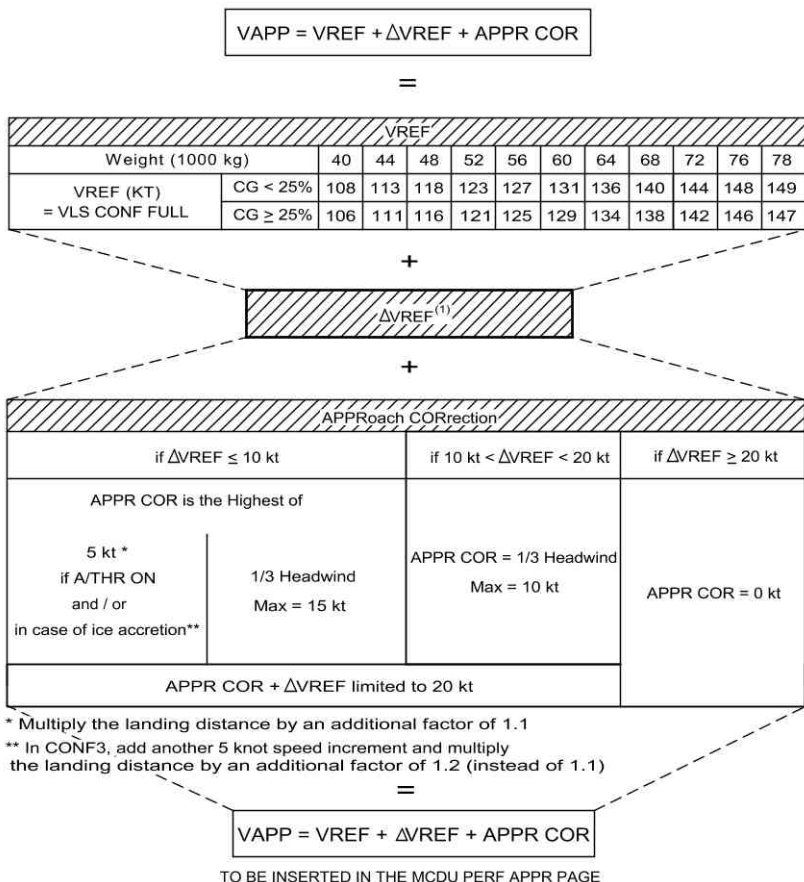


**ECAM ADVISORY CONDITIONS**

SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <b>ENG OIL LO PR</b> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> <p>In both cases, monitor other engine parameters, especially oil temperature and oil quantity.</p>
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	<p>An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.</p> <p><u>Note:</u> If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</p> <p>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</p> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).

## VAPP CALCULATION

**VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION**



(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

**EXAMPLE OF VAPP CALCULATION:**

Failure : ALTN LAW  
 Flight Conditions : Autothrust ON, ice accretion  
 Landing Configuration : CONF 3  
 Headwind : 12 kt  
 Landing Weight/CG : 48 t/25 %  
 VREF determined from the landing weight : 116 kt  
 VREF correction due to the failure (ΔVREF) : 10 kt


As ΔVREF is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- 5+5 = 10 kt (ice accretion and landing in CONF 3)
- 1/3 Headwind = 12 kt/3 = 4 kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

VAPP = VREF + ΔVREF + APPR CORR = 116 + 10 + 10 = 136 kt



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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors** “WITHOUT REV” when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors** “WITH REV” when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:     *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### **LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE**

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### **LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES**

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
RESULT	3	10			1.40×1.90×1.1=3.00

VREF = 131 kt. Therefore VAPP = 131 + 10 + 5 = 146 kt.

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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt



**LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY**

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



*Continued from the previous page*

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.



**LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY**

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
	IR 1+2+3 FAULT	3	10	1.85	1.85
NAV	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.40*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.00*	1.90*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25

- <sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- <sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- <sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- <sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.
- <sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)



**LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY**

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*



*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
	IR 1+2+3 FAULT	3	10	1.45	1.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.35*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK / X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.




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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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### COMPUTER RESET

When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor.

The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.



<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
22	AUTO FLT FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*


ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><b>Note:</b></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the 3 C/B:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li><li>• Channel 1 and 2 (L26 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the 3 C/B.</li></ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight</p> <p><u>Note:</u>     After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>     After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>     If during taxi, when the aircraft is moving, <u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT ECAM alert appears along with the NW STRG DISC memo, the flight crew may attempt to perform only one BSCU reset. If the mentioned alert and memo disappear after this BSCU reset, continue the flight.</p> <p><u>Note:</u>     After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:               <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:               <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<b><u>On ground only:</u></b> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<b><u>On ground, or in flight:</u></b> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.  <b><u>On ground, or in flight:</u></b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>



# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollback	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
<b>BEFORE TAKEOFF Checklist</b>	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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## LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.  
When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

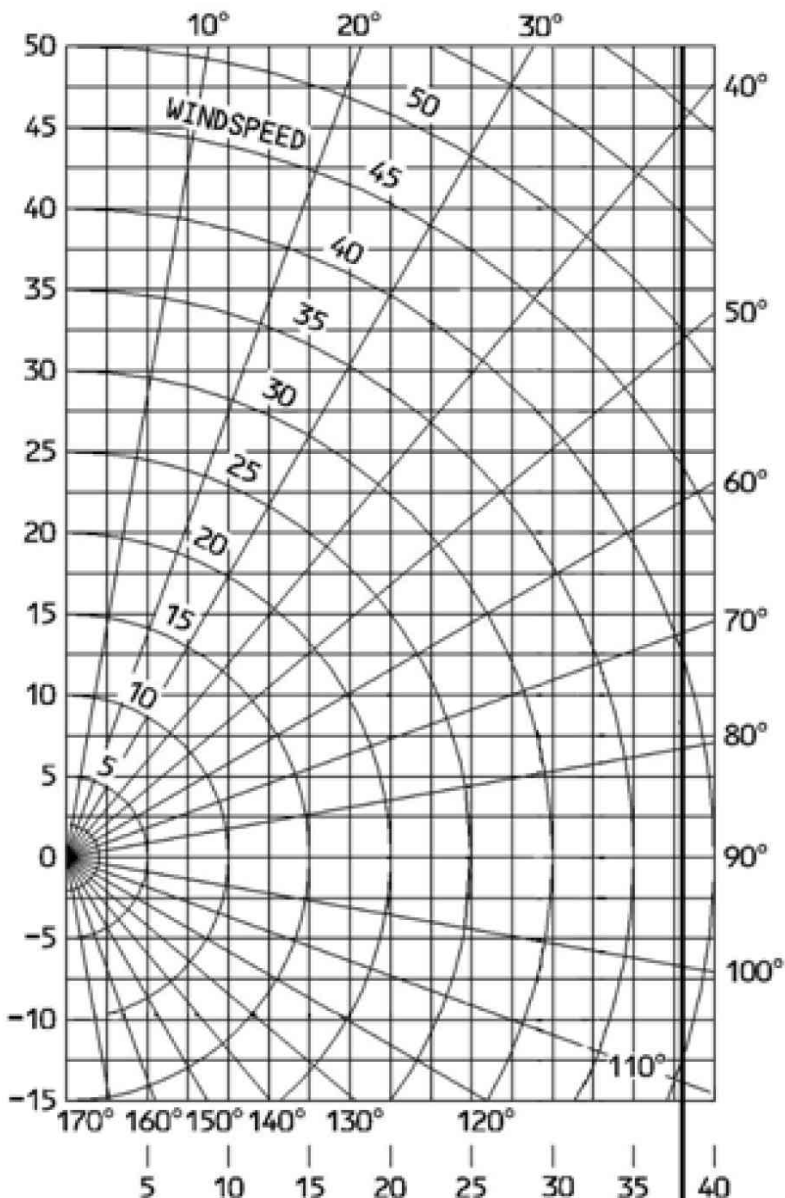
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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

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## ACARS LANDING FAIL CODE - A320

SYS	FAILURE		CODE	SYS	FAILURE		CODE
ELEC	AC BUS 1		01	HYD	GREEN		01
	DC BUS 2		02		BLUE		02
	DC ESS BUS if there is no ice accretion		03		YELLOW		03
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05
	DC EMER CONFIG		06		BLUE + YELLOW		06
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01
	EMER ELEC CONFIG		08				
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02
		S ≥ 1	03	NAV	IR 1+2+3 FAULT		01
	1 ≤ FLAPS < 2	S < 1	04		UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02
		S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT		03
	2 ≤ FLAPS < 3	S < 1	06	BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01
		S ≥ 1	07				
	FLAP = 3	S < 1	08	ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	09		REV UNLOCK with buffet (CONF 3)		02
		S > 3	10		SHUTDOWN with ENG FIRE pb pushed and ice accretion		03
	FLAP > 3	S < 1	11				
		1 ≤ S ≤ 3	12				
		S > 3	13				
F/CTL	ONE SPLR FAULT		01				
	TWO SPLR FAULT		02				
	THREE SPLR FAULT		03				
	ALL SPLR FAULT/GND SPLR FAULT		04				
	SEC 1 or SEC 3 FAULT		05				
	SEC 2 FAULT		06				
	SEC 2 + 3 FAULT		07				
	SEC 1 + 3 FAULT		08				
	SEC 1 + 2 FAULT		09				
	RUDDER JAM		10				
	SEC 1 + 2 + 3 FAULT		11				
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12				

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**IN FLIGHT PERFORMANCE**

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SPEEDS

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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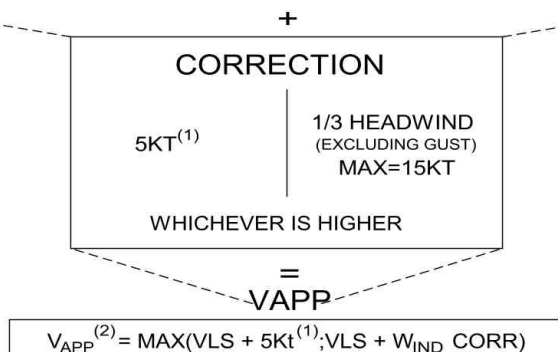
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

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LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %	+16 %	+24 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+3 %
2 reversers operative	-5 %	-12 %	-15 %	-14 %	-12 %	-27 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note:    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 × 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 × 1.06 × 1.08 = 1 020 m.

## LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

**Note:** - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

### EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg

Pressure altitude = 2 000 ft

Approach speed = VLS + 5 kt

## Dry runway

Read from ALD table.

ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table.

Pressure altitude correction:  $3 \times 2 = +6 \%$

Speed increment correction : +8 %

$$\text{ALD (2 000 ft, No wind, VLS, no reversers)} = 830 \times 1.06 \times 1.08 = 960 \text{ m.}$$

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

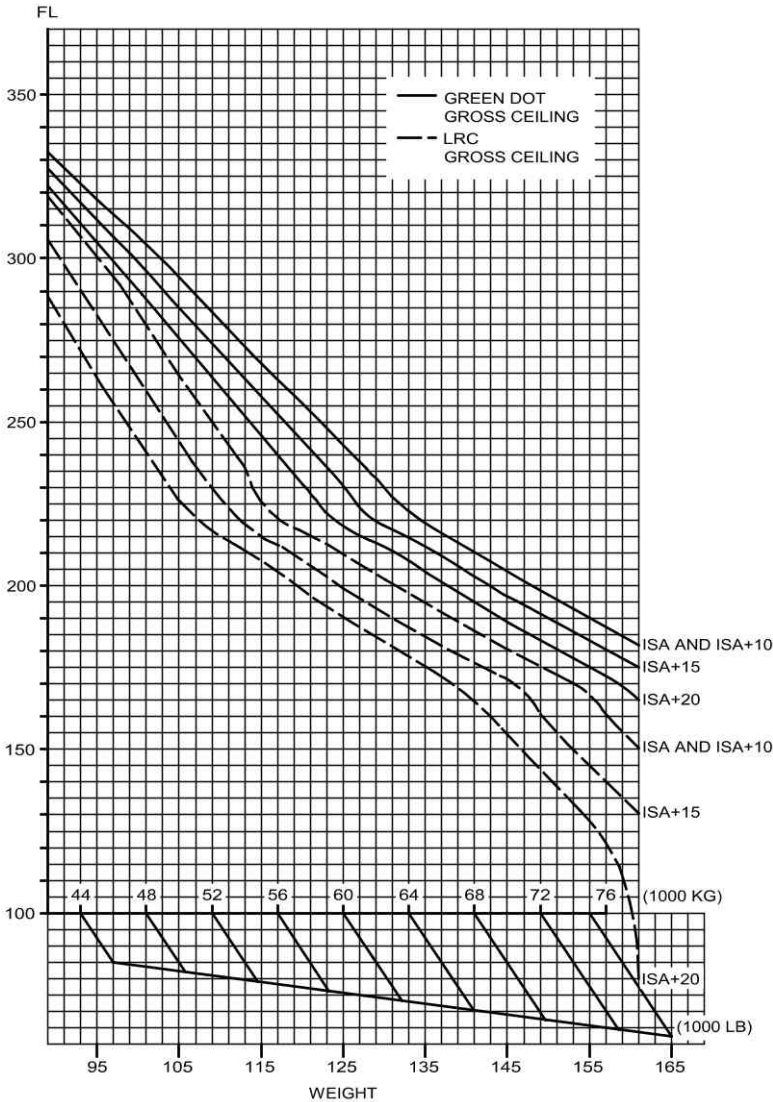
ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

## CEILINGS

**ONE ENGINE OUT**

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT											
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)			
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)			
ANTI ICE OFF								LEVEL OFF (FT)			
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL										
	250	290	310	330	350	370	390				
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200				
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300				
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200				
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200				
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600				
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100				
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800				
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400				
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100				
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600				
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000					
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400					
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800					
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200					
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600						
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON					
FUEL		+ 14 %				+ 28 %					
TIME		+ 13 %				+ 26 %					
DISTANCE		+ 12 %				+ 23 %					
LEVEL OFF		- 700 ft				- 1800 ft					



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b>
		30 MAR 12

## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)	MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584	
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241	
<b>52</b>	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594	
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246	
<b>54</b>	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602	
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249	
<b>56</b>	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600	
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248	
<b>58</b>	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585	
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242	
<b>60</b>	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562	
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232	
<b>62</b>	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570		
	2434 285	2287 272	2225 266	2248 268	2055 246		
<b>64</b>	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544		
	2454 284	2382 279	2317 272	2272 267	2037 234		
<b>66</b>	1.243 .513	1.322 .556	1.397 .591	1.421 .585			
	2476 284	2432 281	2399 277	2264 263			
<b>68</b>	1.247 .512	1.330 .558	1.412 .599	1.426 .570			
	2499 283	2472 282	2473 280	2253 256			
<b>70</b>	1.254 .514	1.338 .560	1.426 .604	1.436 .543			
	2550 285	2516 283	2537 283	2232 243			
<b>72</b>	1.262 .517	1.351 .567	1.428 .598				
	2604 287	2592 286	2533 280				
<b>74</b>	1.270 .521	1.365 .575	1.432 .587				
	2666 289	2673 290	2523 274				
<b>76</b>	1.290 .539	1.381 .585	1.438 .571				
	2805 299	2767 296	2509 267				
<b>78</b>	1.308 .554	1.395 .593	1.450 .537				
	2927 307	2850 300	2478 250				
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %			

# IN CRUISE QUICK CHECK LONG RANGE

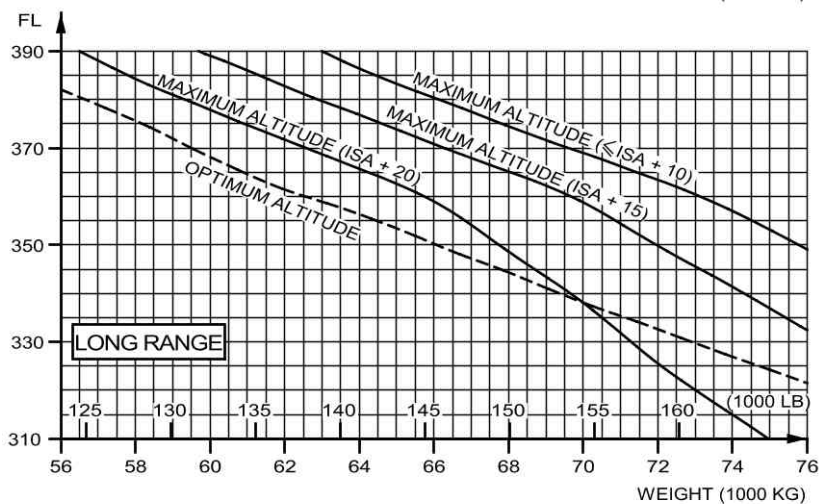
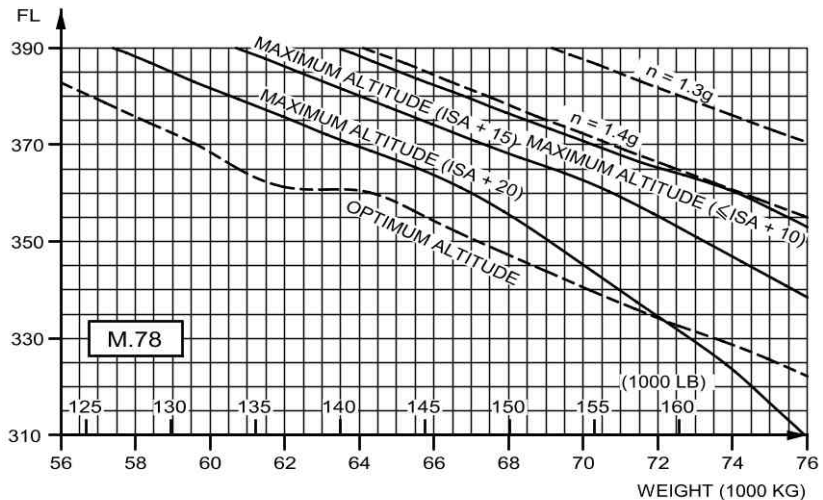
**ONE ENGINE OUT**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG PACK FLOW HI ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
						TIME (H.MIN)			
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %				TOTAL ANTI ICE ON △FUEL = + 6 %					



## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-AEO</b> <b>2/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

### ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)  TIME (H.MIN)			
AIR  DIST.  (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING ΔFUEL = - 0.4 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %			TOTAL ANTI ICE ON ΔFUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP

CL-NQ-04-10-140

## COST INDEX FOR LONG RANGE CRUISE SPEED

### ALL ENGINES

For a quick determination of the  $CI_{LRC}$ , use:

- $CI_{LRC} = 40$  kg/min in the FMGC.
- or
- $CI_{LRC} = 55$  (100 lb/h) in the FMGC.



## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									
	45				65				
	TIME	FUEL	DIST.	EPR	TIME	FUEL	DIST.	EPR	IAS
FL	(MIN)	(KG)	(NM)		(MIN)	(KG)	(NM)		(KT)
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

# QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
AIR DIST. (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
△FUEL = - 1 %			△FUEL = + 3 %			△FUEL = + 7 %			

CL-W0-04-13-140

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-CAB</b> <b>1/2</b> 30 MAR 12
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## IN CRUISE QUICK CHECK FL 100 LONG RANGE

### FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING CRUISE : LONG RANGE - DESCENT : 250KT IMC PROCEDURE : 120 KG (6MIN)								FL100
NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)							
	50	55	60	65	70	75	80	
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15	
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18	
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21	
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24	
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27	
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30	
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34	
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37	
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40	
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43	
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46	
260	1870 1.03	1936 1.00	2004 0.59	2074 0.57	2148 0.55	2222 0.52	2277 0.50	
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.58	2396 0.55	2456 0.53	
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.58	2634 0.56	
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.59	
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02	
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06	
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09	
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12	
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15	
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19	
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22	
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25	
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29	
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32	
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35	
AIR CONDITIONING OFF △FUEL = - 1.5 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 6 %			

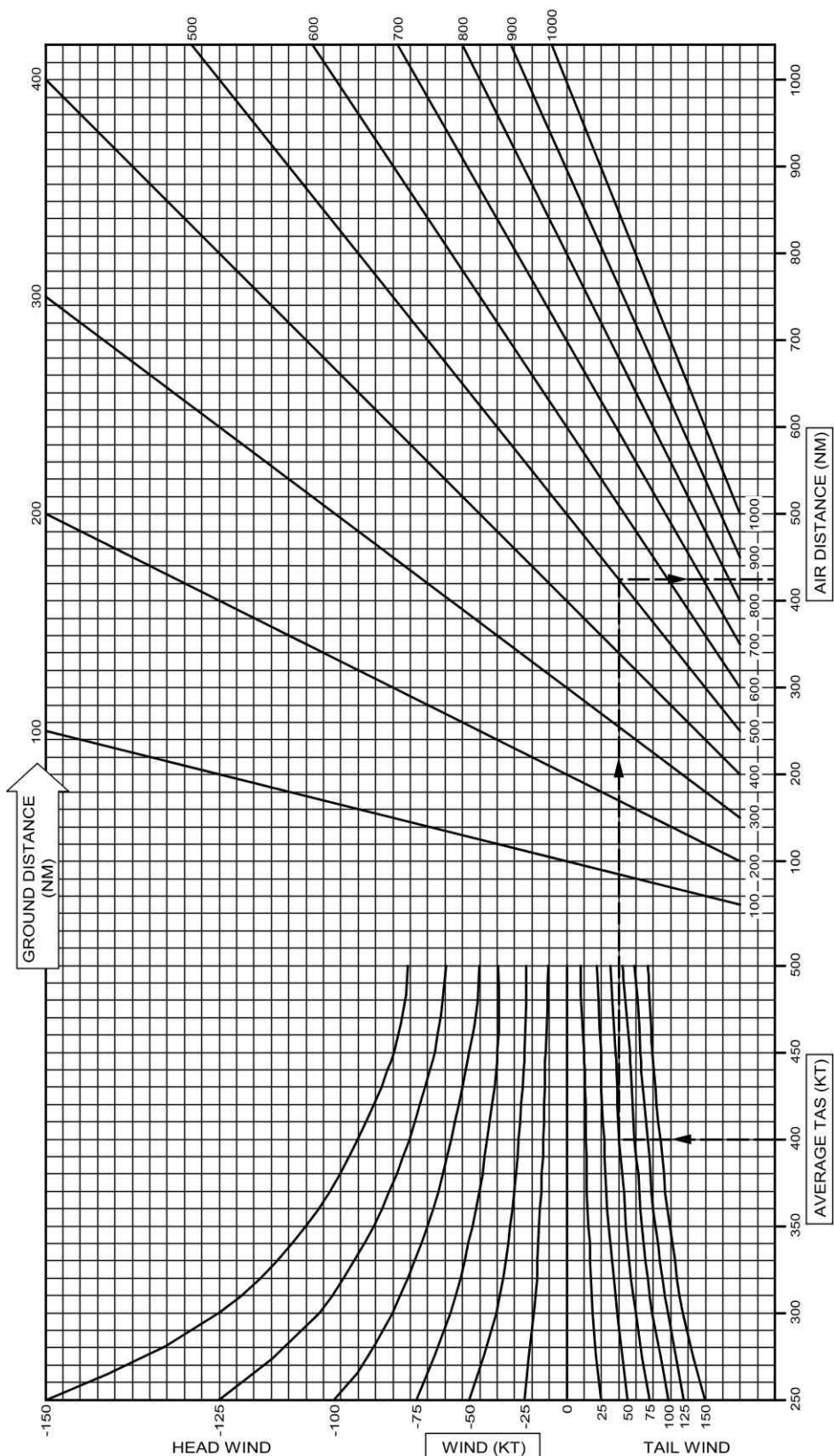
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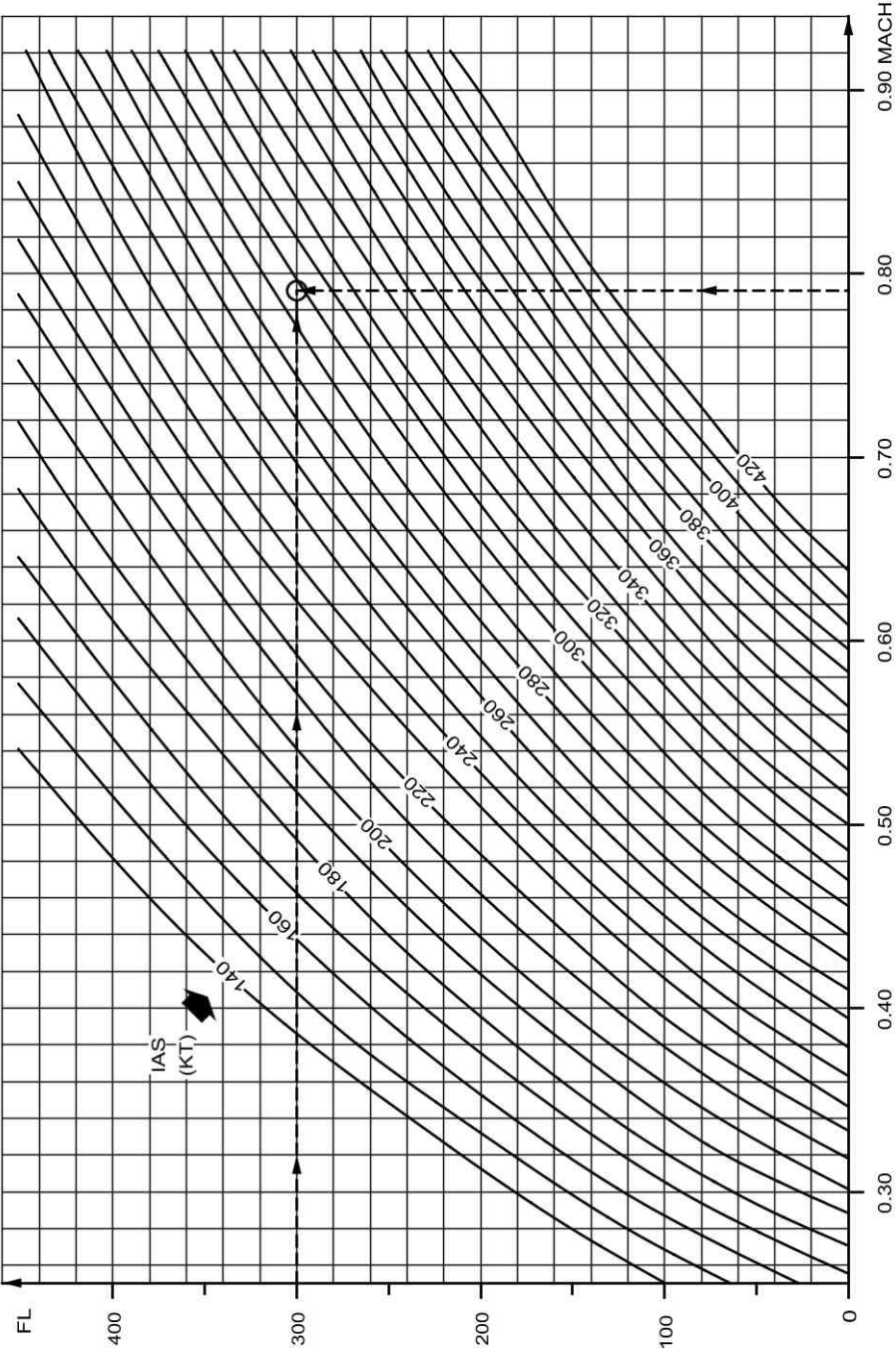




## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT	L/G DOOR	All landing gears doors are extended	15 %
	DOORS NOT CLOSED			

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

## FUEL PENALTY FACTORS/INOP SYS TABLE

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

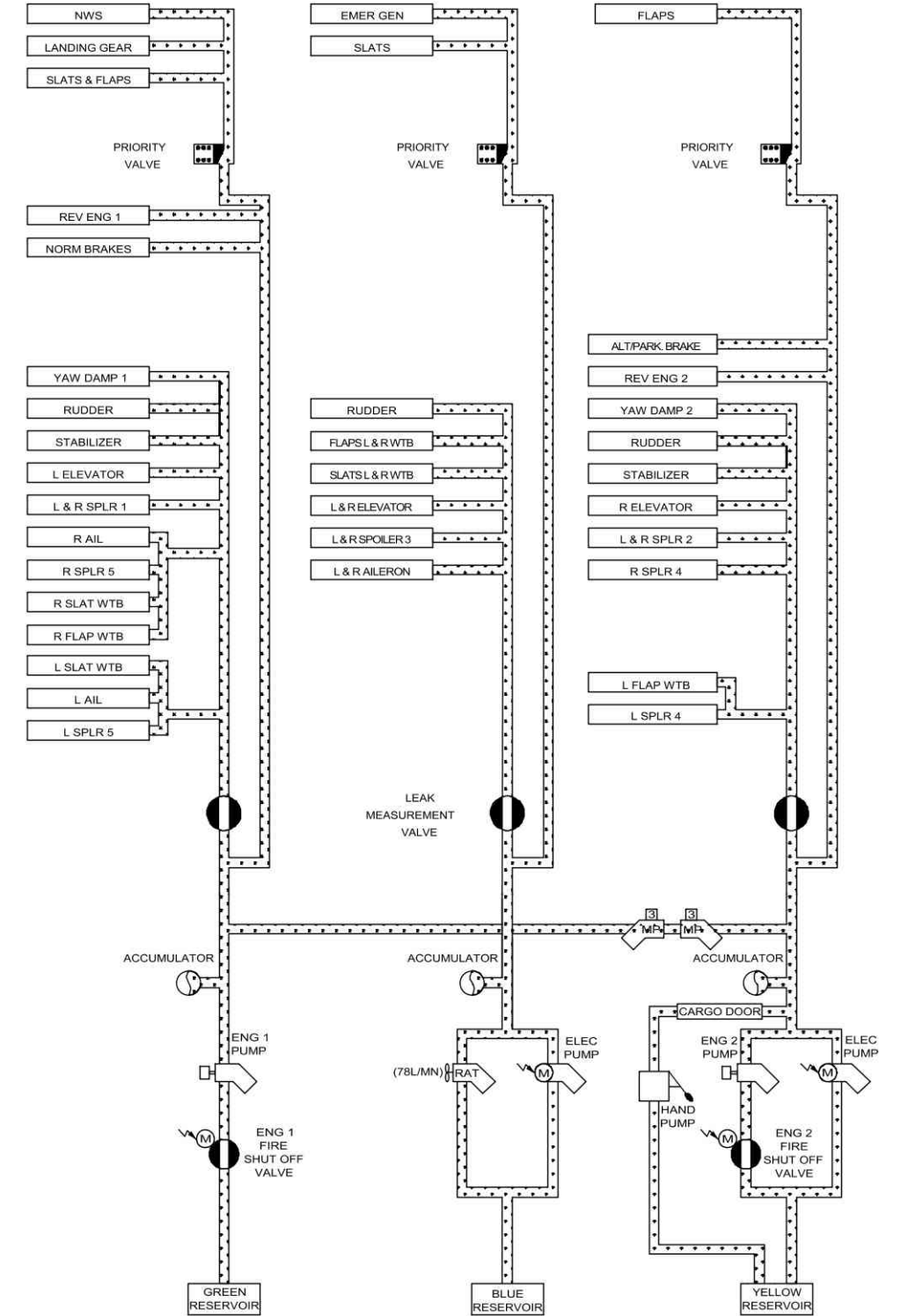
FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

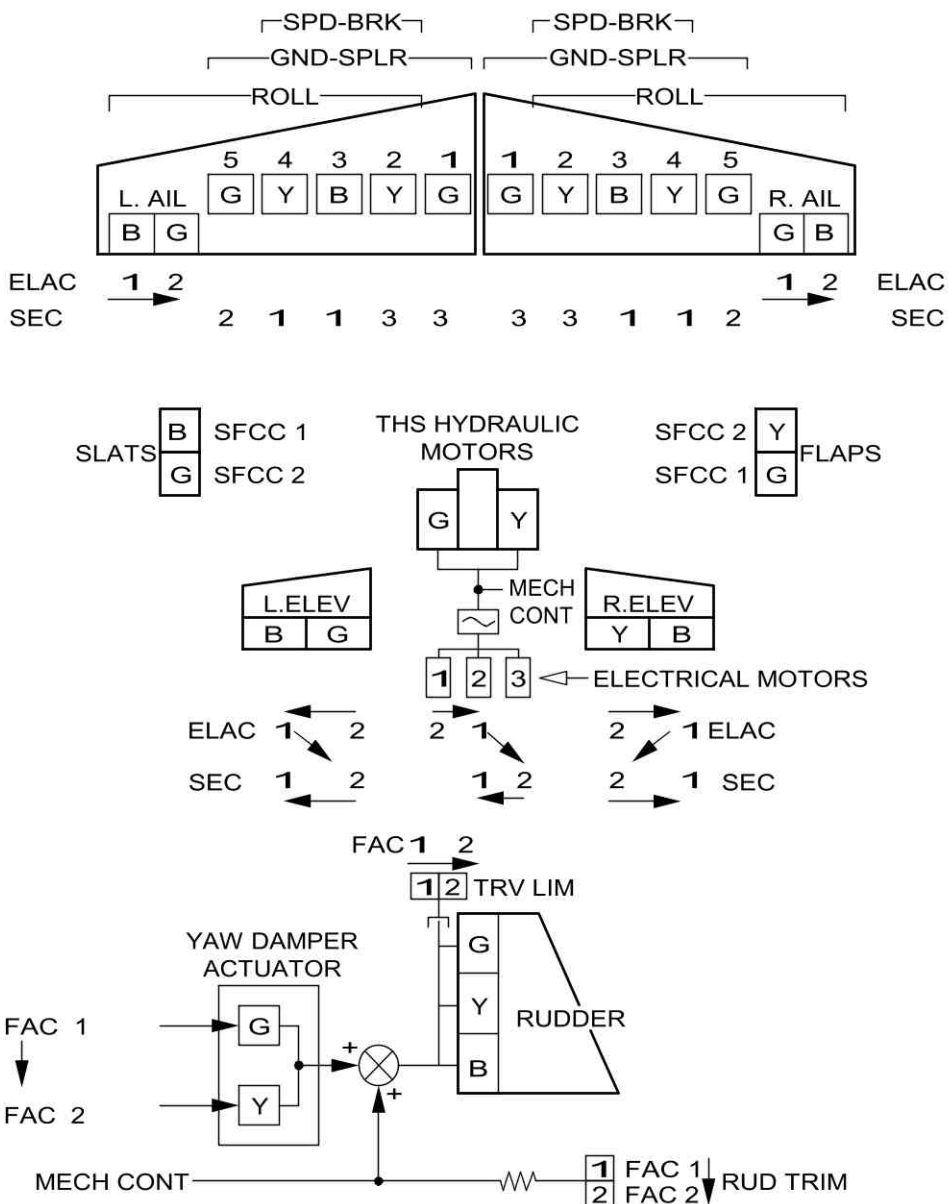
● **FOR APPROACH:**

A/THR in managed speed.....USE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
ADR/IR	2/2	2/2	3/3	
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
ATTITUDE INDICATION (STBY )	1	1	1	
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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**"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight.. 11.00**  
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**OEBPROC-30 No SRS Engagement During Go Around Below MDA**

**No SRS Engagement During Go Around Below MDA..... 30.00**  
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**OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

**Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....31.00**  
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**OEBPROC-38 Erroneous Radio Altimeter Height Indication**

**Erroneous Radio Altimeter Height Indication..... 38.00**  
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**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**


**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.00**  
**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.01**

**OEBPROC-43 F/CTL SPOILER FAULT**

**F/CTL SPOILER FAULT..... 43.00**  
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## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an ENG 1(2) OIL FILTER CLOG ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSG					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSG					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side).....OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side).....OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED.....OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER.....IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB30 Issue 1.0

# NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 188.

One Operator reported a case where the flight crew initiated a Go Around slightly below the Minimum Descent Altitude (MDA), and the aircraft did not pitch up as expected. The flight crew performed a non precision approach (a VORDME approach) using the FINAL APP managed guidance mode with the AP1 (Autopilot) engaged during the final approach.

This OEB is issued to provide flight crews with an operational procedure to avoid such aircraft behavior.

The operational procedure provided in this OEB applies to all Non Precision Approaches, for both conventional approaches and RNAV approaches, flown in FINAL APP managed guidance mode.

**Applicable to:**

All A318/A319/A320/A321 aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		30.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013526.0002001	30 MAR 12
Criteria: SA Applicable to: B-HSG					
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013527.0002001	30 MAR 12
Criteria: SA Applicable to: B-HSG					





## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

### ECAM ENTRY

None

### PROCEDURE

During a non precision approach, when using the FINAL APP managed guidance mode:

- **At DA(DH) or MDA(MDH), or earlier in approach if visual conditions are obtained:**

DISENGAGE the FINAL APP mode by pressing the APPR pushbutton on the FCU.

When the flight crew presses the APPR pb in order to disengage the FINAL APP managed guidance mode, a basic vertical guidance mode, either V/S or FPA, engages.

This ensures that the SRS and GA TRK guidance modes correctly engage, if the flight crew initiates a go-around slightly below MDA (MDH).

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	BLANK
		30 MAR 12

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSG				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSG				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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		30 MAR 12

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSG				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSG				





## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	<b>BLANK</b>
		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSG				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSG				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



# AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).



## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSG				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSG				





## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above  $V_{FE_{NEXT}}$ , the flight crew should deselect A/THR, decelerate to  $V_{FE_{NEXT}}$ , and select CONF 1 when below  $V_{FE_{NEXT}}$ . When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... $V_{REF} + 10KT$

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers.....x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSG				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSG				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

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		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSI**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date

No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSI</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HSI</b>				
	OEB30 issue 1.0	W	N	30 MAR 12	No SRS Engagement During Go Around Below MDA
	Criteria: SA <b>Applicable to: B-HSI</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSI</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSI</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSI</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSI</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-30	No SRS Engagement During Go Around Below MDA	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


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M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSI</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	0930	HDA 0055	B-HSI	320-232


(1) Evolution code : N=New, R=Revised

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	<b>Applicable to: ALL</b>			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	<b>Applicable to: ALL</b>			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	<b>Applicable to: ALL</b>			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	<b>Applicable to: ALL</b>			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	<b>Applicable to: ALL</b>			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	<b>Applicable to: ALL</b>			
	P5769		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF NEW RAIN REPELLENT
	<b>Applicable to: ALL</b>			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	<b>Applicable to: ALL</b>			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	<b>Applicable to: ALL</b>			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF RAIN REPELLENT SYSTEM
	<b>Applicable to: ALL</b>			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	<b>Applicable to: ALL</b>			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	<b>Applicable to: ALL</b>			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	<b>Applicable to: ALL</b>			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	<b>Applicable to: ALL</b>			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	31-1141 04		30 AUG 10	INDICATING/RECORDING SYSTEMS - FWS - INTRODUCE FWC STANDARD H1P-E3P.
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	Applicable to: ALL			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	Applicable to: ALL			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	Applicable to: ALL			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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**ABN-PLP PRELIMINARY PAGES**

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**CABIN OVERPRESSURE.....21.01**

**ABN-22 Auto Flight**

**LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset).....22.01**  
**LOW ENERGY WARNING.....22.02**

**ABN-24 Electrical**

**ELEC EMER CONFIG SYS Remaining..... 24.01**  
**ELEC EMER CONFIG Summary.....24.02**  
**FLT ON BAT ONLY..... 24.03**

**ABN-25 Equipment**

**COCKPIT DOOR FAULT..... 25.01**

**ABN-26 Fire Protection**

**■ SMOKE/FUMES REMOVAL ■..... 26.01**  
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<b>Use of the LDG CONF / APPR SPD / LDG DIST Tables.....</b>	<b>80.15</b>
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## CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

LAND ASAP

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.
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## LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### ■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:

#### ● When the system has recovered:

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### ■ DESCENT (IF TIME PERMITS) :

#### ● When the system has recovered:

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		



**ELEC EMER CONFIG SYS REMAINING**

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



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ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
PNEU	STBY ALTI (VIB)	Norm	Inop	Inop
	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
APU	X BLEED (MAN CTL)	Norm	Inop	Inop
	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
PWR PLT	FUEL PUMP	Norm	Norm	Norm
	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
MISC	HP FUEL VALVE closure	Norm	Norm	Norm
	MECH HORN	Norm	Norm	Norm

(a) Restored, when speed is below 100 kt.

(b) Crew oxygen valve inoperative.

(c) Lost, when speed is below 50 kt.


(d) Lost 30 s after last engine shutdown.

(e) IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f) For APU start only.

(g) Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.



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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● <b>AT 1000 FT AGL:</b> L/G..... DOWN ● <b>When L/G down: BATTERIES ONLY, USE MAN PITCH TRIM</b>

LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>

GO-AROUND
● <b>When L/G uplocked:</b> EMER ELEC PWR.....MAN ON

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
DRY Runway	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

FLT ON BAT ONLY

Flight time on batteries only may be increased to at least 30 min as follows:

ENG MODE SEL..... NORM

ANTI ICE PITOT 1 C/B (D02)..... PULL

26 V ADIRU 1 C/B (F07).....PULL

*CM 1 altitude, speed, and vertical speed indication on PFD are lost. Use standby instruments*

● **7 min before landing:**

ANTI ICE PITOT 1 C/B (D02)..... RESET

● **After 1 min:**

<b>CAUTION</b>	This time delay is necessary to ensure reliable speed information even in icing conditions when the ADIRU is reset to ON.
----------------	---------------------------------------------------------------------------------------------------------------------------

26 V ADIRU 1 C/B (F07).....RESET

COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● If one or more electrical latches (strikes) are faulty:

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● If two pressure sensors are faulty:

Automatic latch release is not available, in case of cockpit decompression.

● If no LED on the CKPT DOOR CONT panel is on:

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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SMOKE/FUMES REMOVAL

- EMER EXIT LIGHT..... ON
- **If fuel vapors:**
- CAB FANS..... ON
- PACK 1+2..... OFF
- **If no fuel vapors:**
- CAB FANS..... OFF
- PACK FLOW..... HI
- LDG ELEV..... 10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE
- ATC..... NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*
- **At FL 100 OR MEA:**
- APU MASTER SW (if in ELEC EMER CONFIG)... ON
- PACK 1+2..... OFF
- MODE SEL..... MAN
- MAN V/S CTL..... FULL UP
- RAM AIR..... ON
- APU MASTER SW..... OFF
- **If smoke persists, open CKPT window:**
- MAX SPEED..... 200 KT
- COCKPIT DOOR..... OPEN
- HEADSETS..... ON
- PNF COCKPIT WINDOW..... OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE



## SMOKE/FUMES/AVNCS SMOKE

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALLEY..... OFF

SIGNS..... ON

CKPT/CABIN COM..... ESTABLISH

● **IF REQUIRED:**

CREW OXY MASKS..... ON/100%/EMER

● **IF SMOKE SOURCE IMMEDIATELY OBVIOUS,  
ACCESSIBLE, AND EXTINGUISHABLE:**

FAULTY EQPT..... ISOLATE

● **IF SMOKE SOURCE NOT IMMEDIATELY  
ISOLATED:**

DIVERSION..... INITIATE

DESCENT (FL 100 or MEA, or minimum obstacle  
clearance altitude)..... INITIATE

● **AT ANY TIME of the procedure, if SMOKE/FUMES  
becomes the GREATEST THREAT :**

SMOKE/FUMES REMOVAL..... CONSIDER

ELEC EMER CONFIG..... CONSIDER

*Refer to the end of the procedure to set ELEC  
EMER CONFIG*

● **At ANY TIME of the procedure, if situation  
becomes UNMANAGEABLE :**

IMMEDIATE LANDING..... CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

- **IF AIR COND SMOKE SUSPECTED:**
  - APU BLEED..... OFF
  - BLOWER..... AUTO
  - EXTRACT..... AUTO
  - PACK 1..... OFF
- **If smoke continues:**
  - PACK 1..... ON
  - PACK 2..... OFF
- **If smoke still continues:**
  - PACK 2..... ON
  - BLOWER..... OVRD
  - EXTRACT..... OVRD
  - SMOKE/FUMES REMOVAL..... CONSIDER
- **IF CAB EQUIPMENT SMOKE SUSPECTED:**
  - **If smoke continues:**
    - EMER EXIT LIGHT..... ON
    - BUS TIE..... OFF
    - GEN 2..... OFF
    - SMOKE DISSIPATION..... CHECK
    - FAULTY EQPT..... SEARCH/ISOLATE
  - **If smoke still continues or if faulty equipment confirmed isolated:**
    - GEN 2..... ON
    - BUS TIE..... AUTO
  - **If faulty equipment not confirmed isolated, before L/G extension:**
    - GEN 2..... ON







## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

BUS TIE.....AUTO

SMOKE/FUMES REMOVAL..... CONSIDER

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER

- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF

EMER ELEC PWR..... MAN ON

- WHEN EMER GEN AVAIL:

APU GEN.....OFF

GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- AT 3 min OR 2 000 ft AAL BEFORE LANDING:  
GEN 2..... ON  
EMER ELEC GEN 1 LINE..... ON

- WHEN A/C IS STOPPED:

ALL GEN..... OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

### ■ Repeat the following until landing configuration is reached:

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

### ● As speed reduces through VFE NEXT:

FLAPS LEVER..... ONE STEP DOWN

### ■ When landing configuration is established:

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

### ■ IF SLATS FAULT:

#### ● FOR CIRCUIT:

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

#### ● FOR DIVERSION

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

### ■ IF FLAPS FAULT:

#### ● FOR CIRCUIT:

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

#### ● FOR DIVERSION:

##### ● If FLAPS jammed at 0

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If **FLAPS jammed > 0**

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


Note:

- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED						
Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0		NO LIMITATION				177 kt
0 < S < 1						(Not allowed)
S = 1		230 kt	215 kt	200 kt	185 kt	
1 < S ≤ 3			200 kt	200 kt	185 kt	177 kt
S > 3			177 kt	177 kt	177 kt	177 kt

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM

CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

**STABILIZER JAM**

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

● **IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

● **IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP



**FUEL IMBALANCE**

FOB..... CHECK  
 Compare the FOB + FU, with the FOB at departure.  
 If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. Refer to ABN-28 FUEL LEAK.
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FUEL X FEED..... ON  
 ● On the lighter side and in the center tank:  
   FUEL PUMPS.....OFF  
 ● When fuel is balanced:  
   FUEL PUMPS (WING + CTR)..... ON  
   FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.


FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



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**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*
- **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**  
 CTR TK PUMP 1+2..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
 AVOID NEGATIVE G FACTOR

● **DETERMINE GRAVITY FEED CEILING:**

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● **WHEN REACHING GRVTY FEED CEILING:**

FUEL X FEED..... OFF


● **IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:**

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
 BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
 RUDDER TRIM..... USE

● **WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):**

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147


APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75								
<b>CONTA runway (CONF 3)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

CRUISE											
MAX SPD.....											320/0.77
MANEUVER WITH CARE											
ALTN LAW : PROT LOST											
LANDING CONF						APPROACH SPEED					
Use FLAP 3						VAPP = VREF + 25 kt					

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH											
CAT 2 INOP											
SLATS SLOW / FLAPS JAMMED											
GPWS FLAP MODE.....											OFF
<b>● For Flaps extension:</b> SPD SEL..... VFE NEXT - 5KT											
When in landing CONF : DECELERATE TO CALCULATED VAPP											
Stabilize at VAPP before L/G down, to be trimmed for approach.											
L/G GRAVITY EXTENSION											

LANDING											
<b>FLARE:</b> PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law											
<b>SPOILERS:</b> Only 1 per wing											
<b>NO REVERSER</b>											
<b>BRAKING:</b> BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI											
<b>NO NOSEWHEEL STEERING</b>											

GO-AROUND											
NO GEAR RETRACTION. Increased fuel consumption											
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt											
<b>● For diversion:</b> <b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds <b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt											


ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10								
CORRECTIONS	+ 1 000 ft above SL					+ 10 kt tailwind			
DRY runway	+ 3 %					+ 18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.


*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

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## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*





## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### **PREPARATION**

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### **APPROACH**

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### **BEFORE LANDING**

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOMELT.....DIM

### **FLARE, TOUCH DOWN AND ROLL OUT**

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.



LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE


- **If NOSE L/G abnormal:**  
 NOSE..... MAINTAIN UP  
*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*  
 BRAKES (compatible with elevator efficiency)..... APPLY  
 ENG MASTERS..... OFF  
*Shutdown the engines before nose impact.*

- **If one MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*At touchdown, shut down both engines.*  
 FAILURE SIDE WING..... MAINTAIN UP  
*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*  
 DIRECTIONAL CONTROL..... MAINTAIN  
*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*


- **If both MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*Shut down the engines in the flare, before touchdown.*  
 PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

**WHEN A/C STOPPED**

ENG (all) and APU FIRE pushbutton..... PUSH  
*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*  
 ENG (all) and APU AGENT..... DISCH

- **If Evacuation required:**  
 EVACUATION..... INITIATE  
 - All emergency and passenger doors may be used to evacuate the aircraft.  
 - Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

- **If Evacuation not required:**  
 CABIN CREW and PASSENGERS (PA)..... NOTIFY  
*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW

### (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT



ADR 1 + 2 + 3 FAULT (Cont'd)


● DURING FINAL APPR

V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*

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## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

● **If the message occurs during ILS/LOC approach (LOC green):**

DISREGARD it.

● **If the message occurs in climb, cruise, or descent:**

CHECK navigation accuracy, using raw data.

■ **If the check is positive:**

NAV mode and ND ARC/ROSE NAV may be used.

■ **If the check is negative:**

HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

■ **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**

Use the associated FD/AP.

■ **If not:**

Deselect GPS and revert to basic information.

● **If the message occurs during a Non Precision Approach (NPA):**

■ **Overlay approach:**

SELECT HDG, or TRK, and use raw data.

■ **GPS or RNAV approach:**

GO AROUND, or fly visual, if visual conditions are met.





## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.

During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
 ALIGN light on during 30 s.  
 ATT MODE displayed on CDU.
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

- If “H” is written on the “5” key:
 

H KEY..... PRESS  
 Degree marker, 0 decimal point, ENT and CLR lights come on.

A/C HEADING..... ENTER
- If “H” is not written on the “5” key:
 

A/C HEADING..... ENTER  
 Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.  
 Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.  
 Heading will be displayed on the associated ND.  
 “HDG-ATT MODE” will be displayed on CDU.

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s).....OFF  
 REMAINING AIR DATA.....CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR.....KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs.....OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF.....USE FLAP 3

APP SPD.....VLS +10

LDG DIST PROC.....APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST.....CLB

FLAPS.....RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	250 kt	10.0/CLB	10.5/CLB	11.5/CLB
FL 50 - FL 100		9.0/CLB	9.5/CLB	10.0/CLB
FL 100 - FL 150		8.0/CLB	8.5/CLB	8.5/CLB
FL 150 - FL 200		7.0/CLB	7.0/CLB	7.0/CLB
FL 200 - FL 250	275 kt	5.0/CLB	5.0/CLB	5.0/CLB
FL 250 - FL 320		4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200-FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

### DESCENT

Set the thrust to IDLE.


CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320-FL 200	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE
FL 200 - FL 100	250 kt	1.5/IDLE	0.5/IDLE	-0.5/IDLE
Below FL 100	250 kt	1.0/IDLE	0.0/IDLE	-1.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.5/IDLE	2.5/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 67 t	67 t - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.5/55.7	5.5/51.5	6.0/47.3
1	S	7.5/58.2	7.5/54.0	7.5/49.0
1+F <sup>(1)</sup>	S	4.5/60.2	4.5/56.1	4.5/51.2
2	F	9.0/61.7	9.0/57.3	9.0/52.8



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## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	7.5/67.2	7.5/62.7	7.5/57.9

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

### FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 67 t	67 t - 55 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	4.5/48.0	4.5/44.4	4.5/41.4

**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :  
X BLEED..... CHECK OPEN  
DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
APU BLEED..... ON  
MAX FL200  
AVOID ICING CONDITIONS
- IF ICE ACCRETION  
APPR SPD.....VLS + 10 KT  
LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

CREW OXY MASKS (Above FL 100).....ON

● **WHEN APU AVAIL FL < 200:**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
GALLEY.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*

## ENG DUAL FAILURE - NO FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THRUST LEVERS..... IDLE  
 FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....220 KT/GREEN DOT

*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC..... NOTIFY

CREW OXY MASKS (Above FL 100)..... ON

CABIN AND COCKPIT..... PREPARE

SIGNS..... ON

GALLEY..... OFF

USE RUDDER WITH CARE

● **WHEN BELOW FL 150**

RAM AIR..... ON

### COMMON ACTIONS FOR THE APPROACH

#### **APPROACH PREPARATION**

Note: Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).

BARO..... SET

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### IF FORCED LANDING ANTICIPATED

#### **APPROACH**

FOR LDG.....USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**  
CABIN.....NOTIFY FOR LANDING


**AT 500 FT AGL**  
BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**  
ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

- AFTER LANDING**
- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

    - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
    - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**  
FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT





ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

ENG RELIGHT  
(IN FLIGHT)

- MAX ALTITUDE.....See below  
 ENG MASTER (affected).....OFF  
 THR LEVER (affected)..... IDLE  
 ENG MODE SEL..... IGN  
 X BLEED ..... OPEN  
 WING A. ICE (for starter assist).....OFF  
 ENG MASTER (affected)..... ON

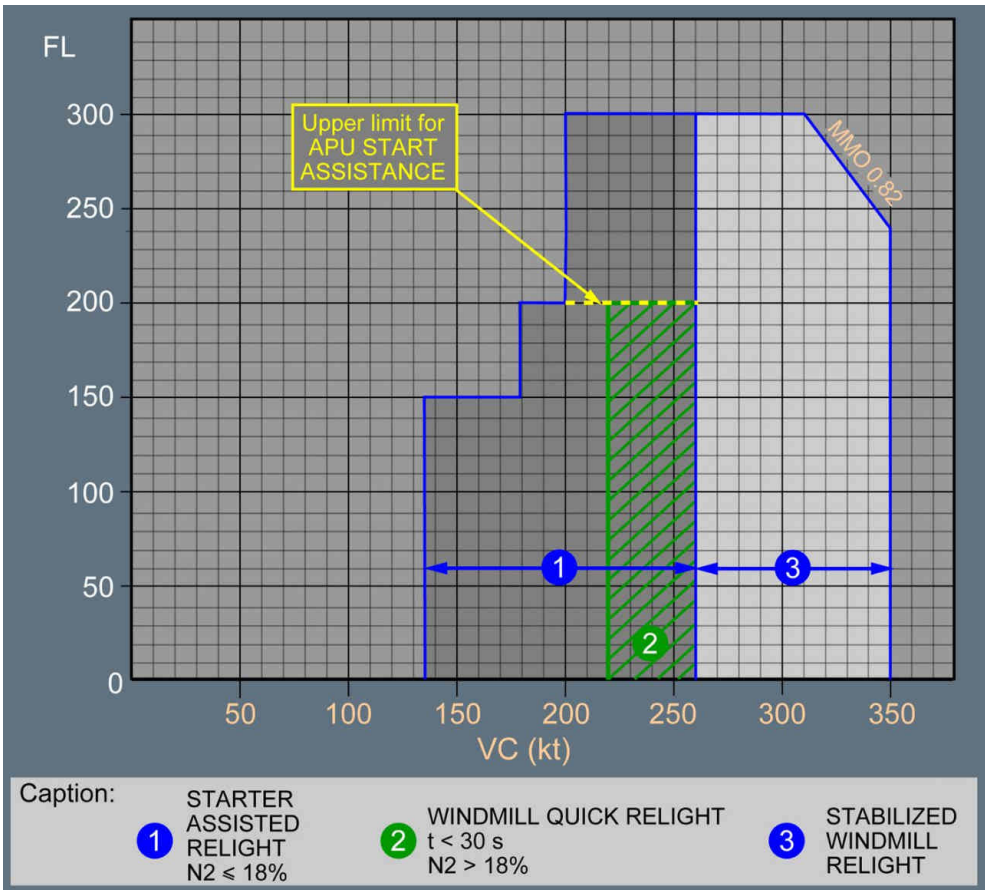
Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.  
 Engine light up should be achieved within 30 s after fuel flow increases.

■ When idle is reached:

- ENG MODE SEL..... NORM  
 TCAS MODE SEL <img alt="TCAS selector symbol"/> ..... check TA/RA  
 Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.  
 Affected SYS..... RESTORE

■ If no relight:

- ENG MASTER (affected)..... OFF  
 Wait 30 s before attempting a new start (to drain the engine).





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

<b>CAUTION</b>	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
----------------	---------------------------------------------------------------------------------------------------------------------------------------------

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

- **When burning has stopped :**  
MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF


ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

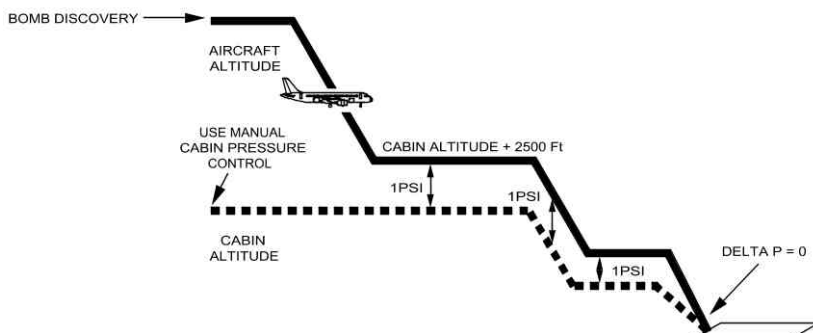
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN





**BOMB ON BOARD (Cont'd)**

- **When at CAB ALT+2 500 ft:**
  - 1 PSI DELTA P..... MAINTAIN
  - GALLEY..... OFF
  - FLAPS (fuel permitting)..... AT LEAST CONF 1
  - For landing, use normal configuration.*
  - LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**
  - 1 PSI DELTA P..... MAINTAIN
- **During approach:**
  - CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**
    - EVACUATION..... INITIATE
    - Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**
    - CABIN CREW and PASSENGERS (PA)..... NOTIFY

**CABIN PROCEDURES**

If a suspect device is found in the cabin:

<b>WARNING</b>	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
<b>WARNING</b>	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
<b>CAUTION</b>	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

- EOD PERSONNEL ON BOARD..... CHECK
- Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*
- BOMB..... DO NOT OPEN
- BOMB..... DO NOT CUT WIRES
- BOMB..... SECURE AGAINST SLIPPING
- BOMB..... AVOID SHOCKS
- Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*
- PASSENGERS..... LEAD AWAY FROM BOMB
- Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*
- Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*
- Seat backs and tray tables must be in their full upright position.*
- Service items may need to be collected in order to secure tray tables.*
- PORTABLE ELECTRONIC DEVICES..... SWITCH OFF
- The cabin crews must command passengers to switch off all portable electronic devices.*



## BOMB ON BOARD (Cont'd)

### BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

### EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

### GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

#### ● If the bomb can be moved:

#### RH AFT CABIN DOOR SLIDE.....DISARM

#### LEAST RISK BOMB LOCATION (LRBL).....PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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### BOMB INDICATION LINE.....POSITION

Note: *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

### BOMB.....MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

<b>CAUTION</b>	<b>Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.</b>
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### LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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*Build up at 25 cm (10 in) of wetted material around the sides and on top of the bomb.*





## BOMB ON BOARD (Cont'd)

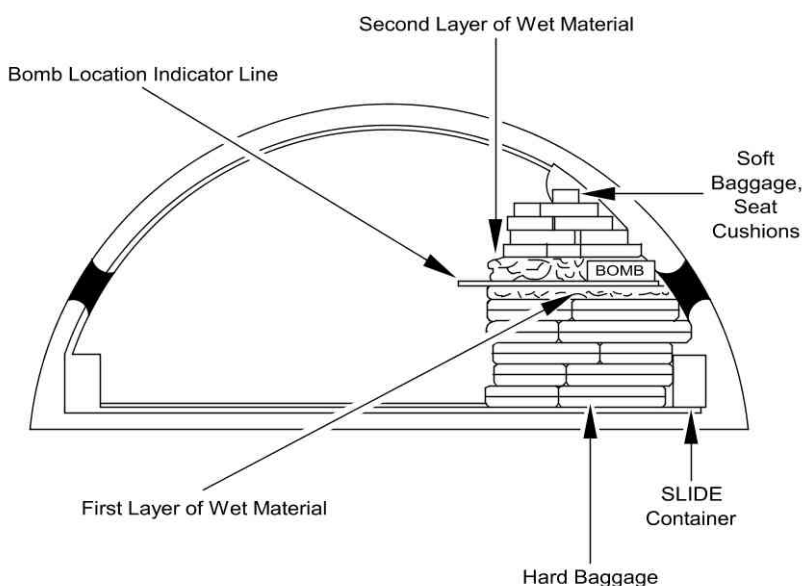
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



### **PASSENGERS.....MOVE/ADVISE**

*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

### **CABIN CREW..... NOTIFY COCKPIT CREW**

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*

### **EVACUATION/DISEMBARKATION.....EXECUTE**

*Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".*

*Use all available airport facilities to disembark without delay.*

## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALLEY.....OFF

LDG ELEV..... SELECT 00

BARO..... SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU)..... DISCH

EVACUATION..... INITIATE



## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### PREPARATION

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR..... OFF

SIGNS..... ON

GALLEY..... OFF

LDG ELEV..... SET

BARO..... SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

### APPROACH

RAM AIR..... ON

L/G lever..... DOWN

SLATS AND FLAPS..... MAX AVAIL

GND SPLR..... ARM

MAX BRK PR..... 1 000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

#### ● When aircraft has stopped:

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ If Evacuation required:

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)		
<div>■ If Evacuation not required: CABIN CREW and PASSENGERS (PA)..... NOTIFY</div>		



## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS..... ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*

### WHEN DESCENT ESTABLISHED


EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

#### CAUTION

*Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: *The recommendation is to descend with the autopilot engaged.  
Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.  
Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown


REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								





## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note: In case of lack of pitch down authority, reducing thrust may be necessary.

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.

**TAILSTRIKE**

In the event of a tailstrike, apply the following procedure:

**LAND ASAP**

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF



## VOLCANIC ASH ENCOUNTER

● **If the aircraft enters a volcanic ash cloud:**

180 ° TURN..... INITIATE  
ATC..... NOTIFY  
A/THR..... OFF  
THRUST (conditions permitting).....REDUCE  
CREW OXYGEN MASKS.....ON/100 %/EMER  
CABIN CREW.....NOTIFY  
PASSENGER OXYGEN.....AS RQRD  
ENG ANTI ICE..... ON  
WING ANTI ICE..... ON  
PACK FLOW..... HI

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

APU..... START  
ENGINE PARAMETERS..... MONITOR  
AIRSPEED INDICATIONS.....MONITOR

*If airspeed is unreliable or lost, Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.*

Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ At takeoff

#### ■ If before V1

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ If after V1

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA..... SET OR CONFIRM  
 AP (if engaged)..... KEEP  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

**DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.**

**CLOSELY MONITOR FLIGHT PATH AND SPEED.**

**RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.**

WINDSHIELD/WINDOW ARCING

Affected WINDOW/WINDSHIELD ANTI ICE C/B..... PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)

**WINDSHIELD/WINDOW CRACKED**

DIAGNOSIS OF INNER PLY.....PERFORM  
*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation  
*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL..... 230/MEA  
*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain ΔP 5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note:     *The following procedure allows maintaining ΔP 5 PSI in manual cabin pressure mode.*

CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

ΔP = 5 PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**

CAB PRESS MODE SEL..... AUTO

Note:     *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL.....FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

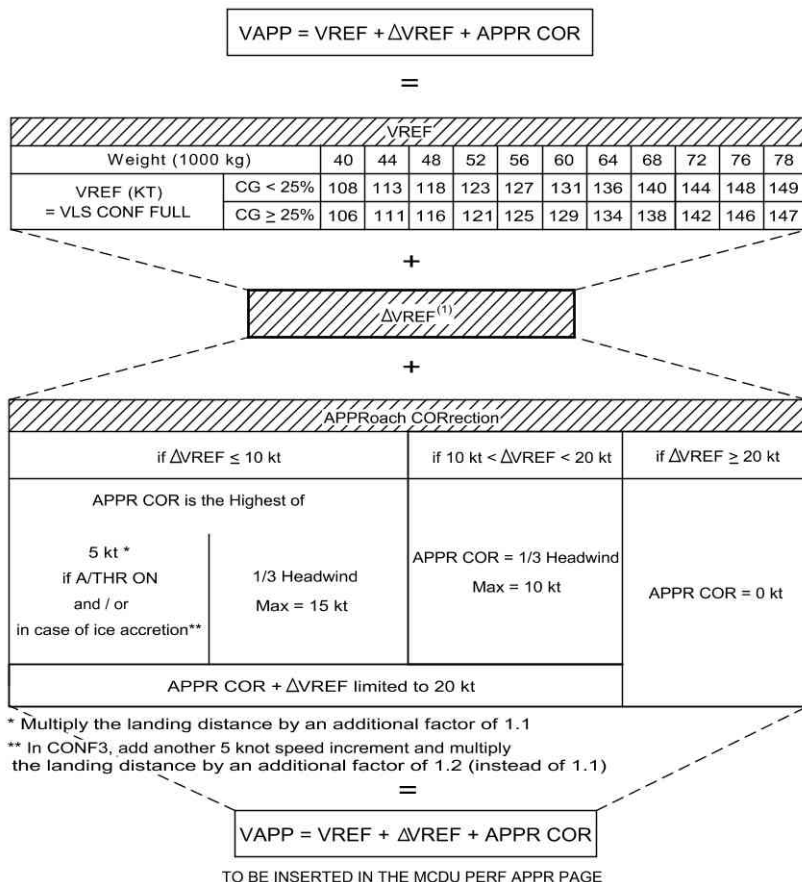


**ECAM ADVISORY CONDITIONS**

SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <b>ENG OIL LO PR</b> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> <p>In both cases, monitor other engine parameters, especially oil temperature and oil quantity.</p>
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	<p>An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.</p> <p><u>Note:</u> If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</p> <p>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</p> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).

## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



\* Multiply the landing distance by an additional factor of 1.1

\*\* In CONF3, add another 5 knot speed increment and multiply the landing distance by an additional factor of 1.2 (instead of 1.1)

(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:

Failure : ALTN LAW  
 Flight Conditions : Autothrust ON, ice accretion  
 Landing Configuration : CONF 3  
 Headwind : 12 kt  
 Landing Weight/CG : 48 t/25 %  
 VREF determined from the landing weight : 116 kt  
 VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- 5+5 = 10 kt (ice accretion and landing in CONF 3)
- 1/3 Headwind = 12 kt/3 = 4 kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136$  kt



<b>USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES</b>
---------------------------------------------------------

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors** “WITHOUT REV” when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors** “WITH REV” when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:     *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
RESULT	3	10			1.40×1.90×1.1=3.00

VREF = 131 kt. Therefore VAPP = 131 + 10 + 5 = 146 kt.

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK		<b>ABNORMAL AND EMERGENCY PROCEDURES</b>			<b>80.15A</b>
					30 MAR 12
FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	25			1.95*
RESULT	3	25			1.95


VREF = 140 kt. Therefore VAPP =140+25 =165 kt



**LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY**

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>80.16A</b>  30 MAR 12

*Continued from the previous page*

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.



**LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY**

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
	IR 1+2+3 FAULT	3	10	1.85	1.85
NAV	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.40*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1  3	55 (APPR) 40 (THRESHOLD) 10	2.00*  1.35*	1.90*  1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25

- <sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- <sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- <sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- <sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.
- <sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)



**LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY**

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*




*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
	IR 1+2+3 FAULT	3	10	1.45	1.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.35*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK / X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15

- <sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- <sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- <sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- <sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.




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## TRIPPED C/B RE-ENGAGEMENT

In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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### COMPUTER RESET

When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor.

The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.



<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
22	AUTO FLT FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*


ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><u>Note:</u> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><u>Note:</u> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><u>Note:</u></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><u>Note:</u></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><u>Note:</u></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the 3 C/B:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li><li>• Channel 1 and 2 (L26 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the 3 C/B.</li></ul> <p><u>Note:</u> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight</p> <p><u>Note:</u>     After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>     After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>     If during taxi, when the aircraft is moving, <u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT ECAM alert appears along with the NW STRG DISC memo, the flight crew may attempt to perform only one BSCU reset. If the mentioned alert and memo disappear after this BSCU reset, continue the flight.</p> <p><u>Note:</u>     After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:                         <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:                         <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>



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*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<b><u>On ground only:</u></b> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<b><u>On ground, or in flight:</u></b> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>
46	ATSU Malfunction	ATSU	<p>An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.</p> <b><u>On ground, or in flight:</u></b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>



# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

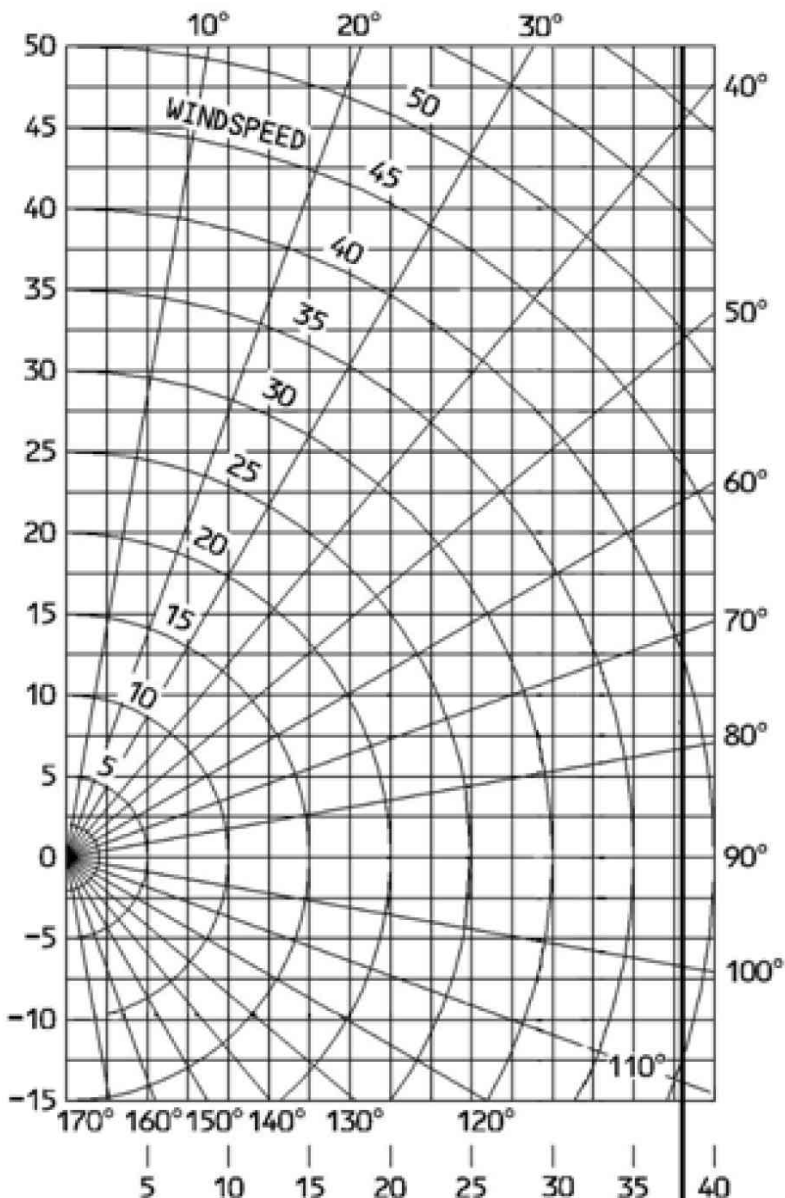
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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1		S < 1		02	AUTO BRK FAULT		02
			S ≥ 1	03				
	1 ≤ FLAPS < 2		S < 1	04	NAV	IR 1+2+3 FAULT		01
			S ≥ 1	05		UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02
	2 ≤ FLAPS < 3		S < 1	06	BLEED	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT		03
			S ≥ 1	07				
	FLAP = 3		S < 1	08	ENG	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01
			1 ≤ S ≤ 3	09				
			S > 3	10				
	FLAP > 3		S < 1	11	ENG	REV UNLOCK with buffet (CONF 1)		01
			1 ≤ S ≤ 3	12		REV UNLOCK with buffet (CONF 3)		02
			S > 3	13		SHUTDOWN with ENG FIRE pb pushed and ice accretion		03
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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**IN FLIGHT PERFORMANCE**

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SPEEDS

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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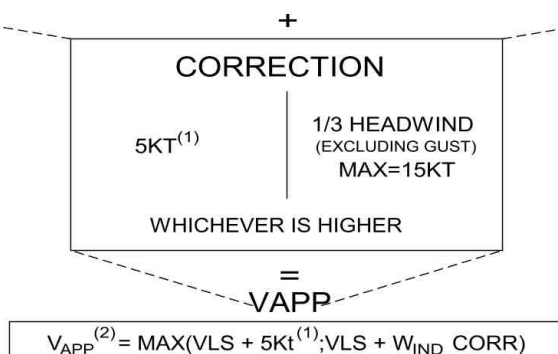
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

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LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %	+16 %	+24 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+3 %
2 reversers operative	-5 %	-12 %	-15 %	-14 %	-12 %	-27 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note:    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 × 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 × 1.06 × 1.08 = 1 020 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:*    - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF FULL

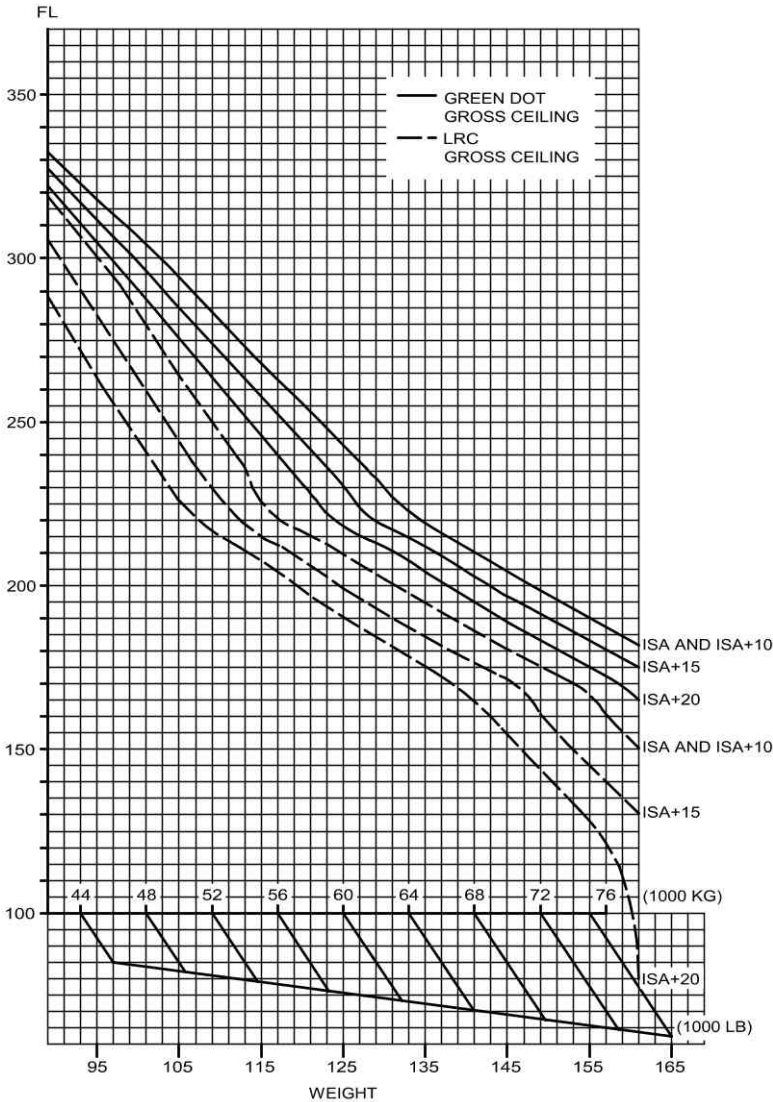
ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

CEILINGS

**ONE ENGINE OUT**

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT										
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)		
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)		
ANTI ICE OFF				LEVEL OFF (FT)						
INIT. GW	INITIAL FLIGHT LEVEL									
(1000KG)	250	290	310	330	350	370	390			
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200			
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300			
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200			
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200			
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600			
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100			
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800			
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400			
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100			
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600			
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000				
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400				
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800				
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200				
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600					
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON				
FUEL		+ 14 %				+ 28 %				
TIME		+ 13 %				+ 26 %				
DISTANCE		+ 12 %				+ 23 %				
LEVEL OFF		- 700 ft				- 1800 ft				



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b>
		30 MAR 12

## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT								
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%		EPR FUEL FLOW (KG/H)		MACH IAS (KT)	
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250		
<b>50</b>	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584		
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241		
<b>52</b>	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594		
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246		
<b>54</b>	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602		
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249		
<b>56</b>	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600		
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248		
<b>58</b>	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585		
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242		
<b>60</b>	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562		
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232		
<b>62</b>	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570			
	2434 285	2287 272	2225 266	2248 268	2055 246			
<b>64</b>	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544			
	2454 284	2382 279	2317 272	2272 267	2037 234			
<b>66</b>	1.243 .513	1.322 .556	1.397 .591	1.421 .585				
	2476 284	2432 281	2399 277	2264 263				
<b>68</b>	1.247 .512	1.330 .558	1.412 .599	1.426 .570				
	2499 283	2472 282	2473 280	2253 256				
<b>70</b>	1.254 .514	1.338 .560	1.426 .604	1.436 .543				
	2550 285	2516 283	2537 283	2232 243				
<b>72</b>	1.262 .517	1.351 .567	1.428 .598					
	2604 287	2592 286	2533 280					
<b>74</b>	1.270 .521	1.365 .575	1.432 .587					
	2666 289	2673 290	2523 274					
<b>76</b>	1.290 .539	1.381 .585	1.438 .571					
	2805 299	2767 296	2509 267					
<b>78</b>	1.308 .554	1.395 .593	1.450 .537					
	2927 307	2850 300	2478 250					
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %				

IN CRUISE QUICK CHECK LONG RANGE

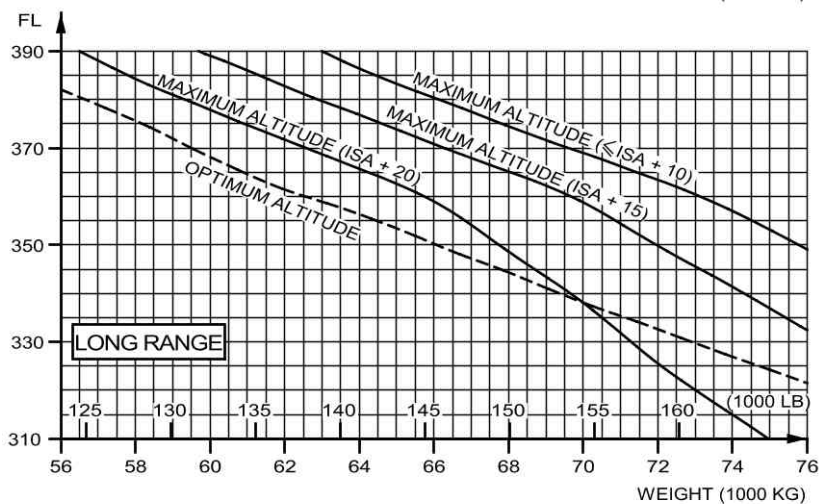
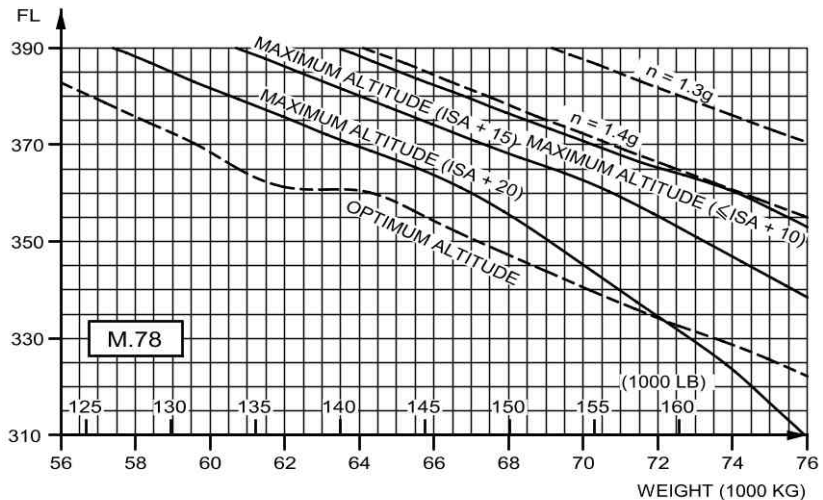
ONE ENGINE OUT

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG				ISA		FUEL CONSUMED (KG)			
PACK FLOW HI				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %				TOTAL ANTI ICE ON △FUEL = + 6 %					



## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
≤ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

# IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING ΔFUEL = - 0.4 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %			TOTAL ANTI ICE ON ΔFUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NQ-04-10-140

# COST INDEX FOR LONG RANGE CRUISE SPEED

ALL ENGINES

- For a quick determination of the  $CI_{LRC}$ , use:
- $CI_{LRC}$  = 40 kg/min in the FMGC.
  - or
  - $CI_{LRC}$  = 55 (100 lb/h) in the FMGC.



## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									IAS (KT)
	45				65				
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
△FUEL = - 1 %			△FUEL = + 3 %			△FUEL = + 7 %			

CL-W0-04-13-140

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## IN CRUISE QUICK CHECK FL 100 LONG RANGE

### FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING			ISA		FUEL CONSUMED (KG)		
ANTI-ICING OFF			CG = 25.0%		TIME (H.MIN)		
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46
260	1870 1.03	1936 1.00	2004 0.59	2074 0.57	2148 0.55	2222 0.52	2277 0.50
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.58	2396 0.55	2456 0.53
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.58	2634 0.56
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.59
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35
AIR CONDITIONING OFF ΔFUEL = - 1.5 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %		TOTAL ANTI ICE ON ΔFUEL = + 6 %		

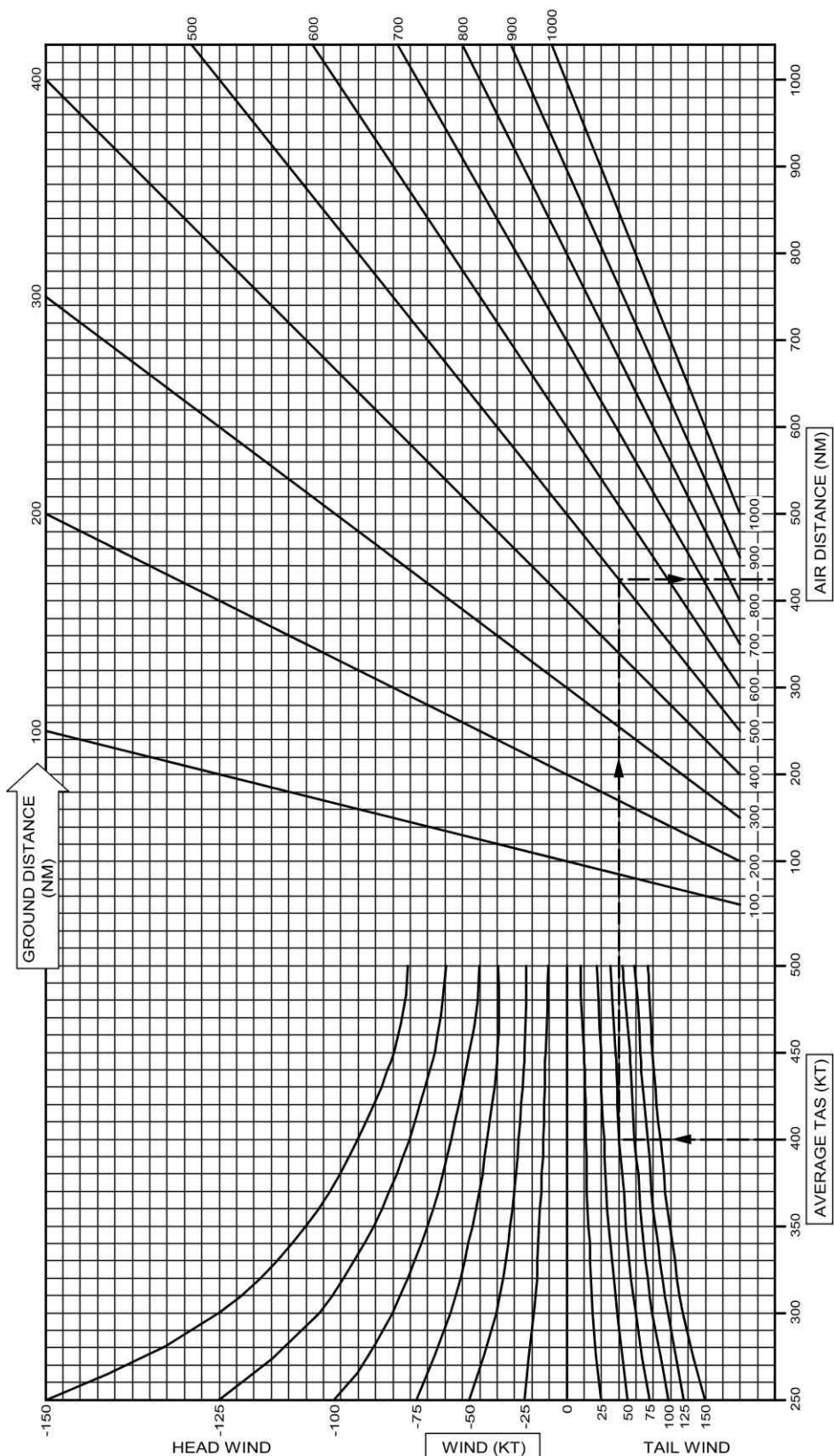
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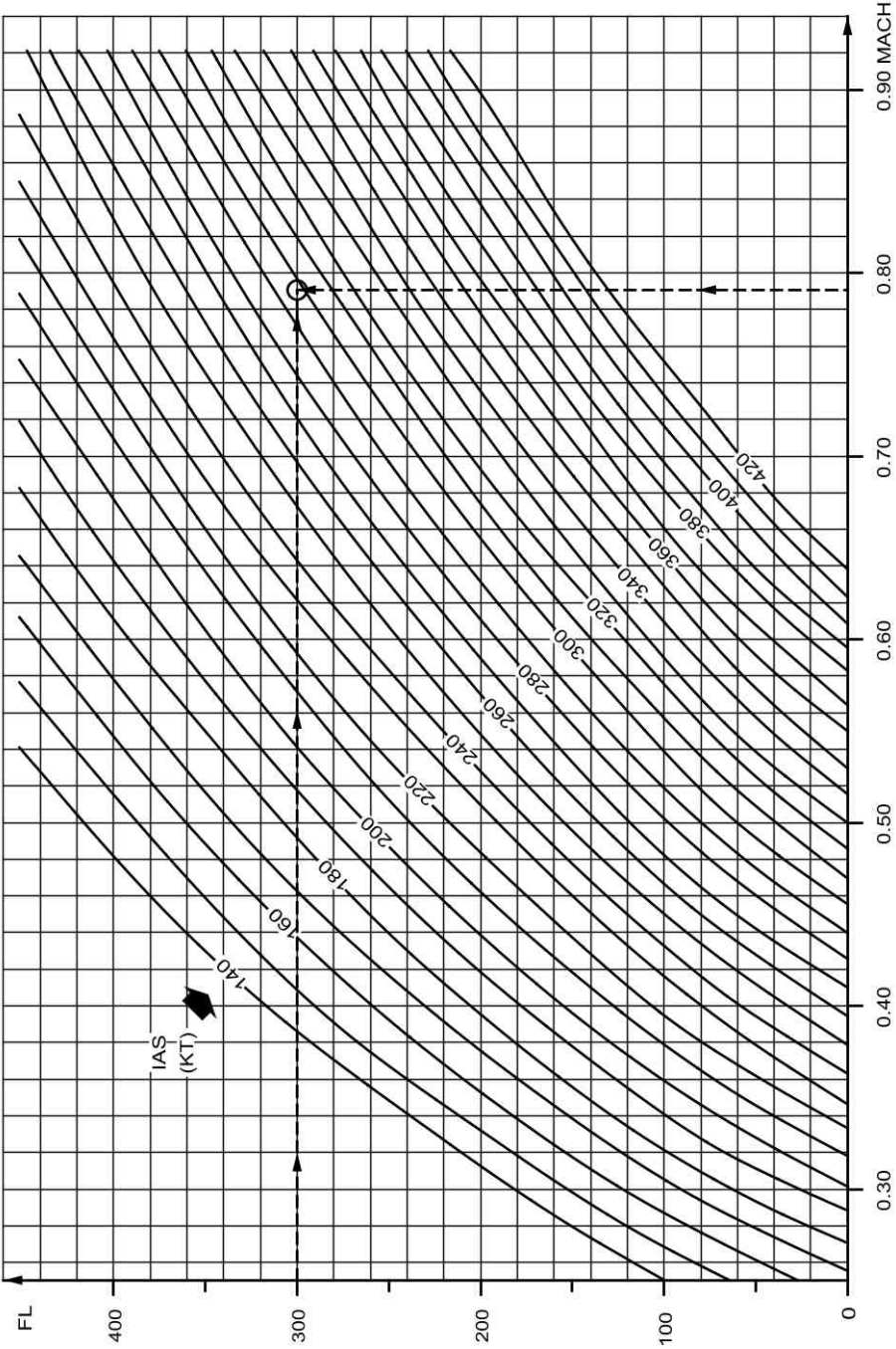




## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**SEVERE TURBULENCE..... OPS.01**

**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

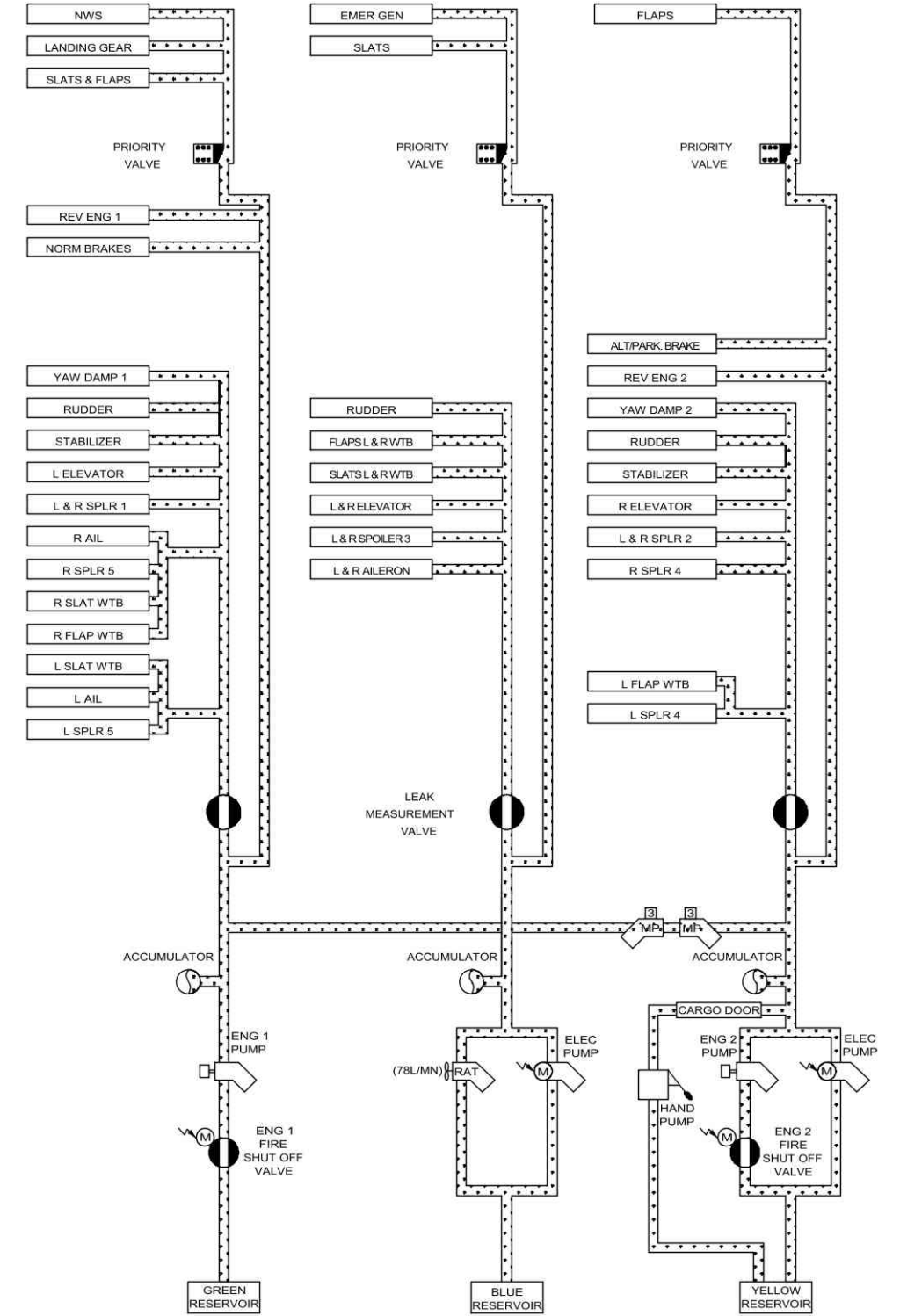
FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

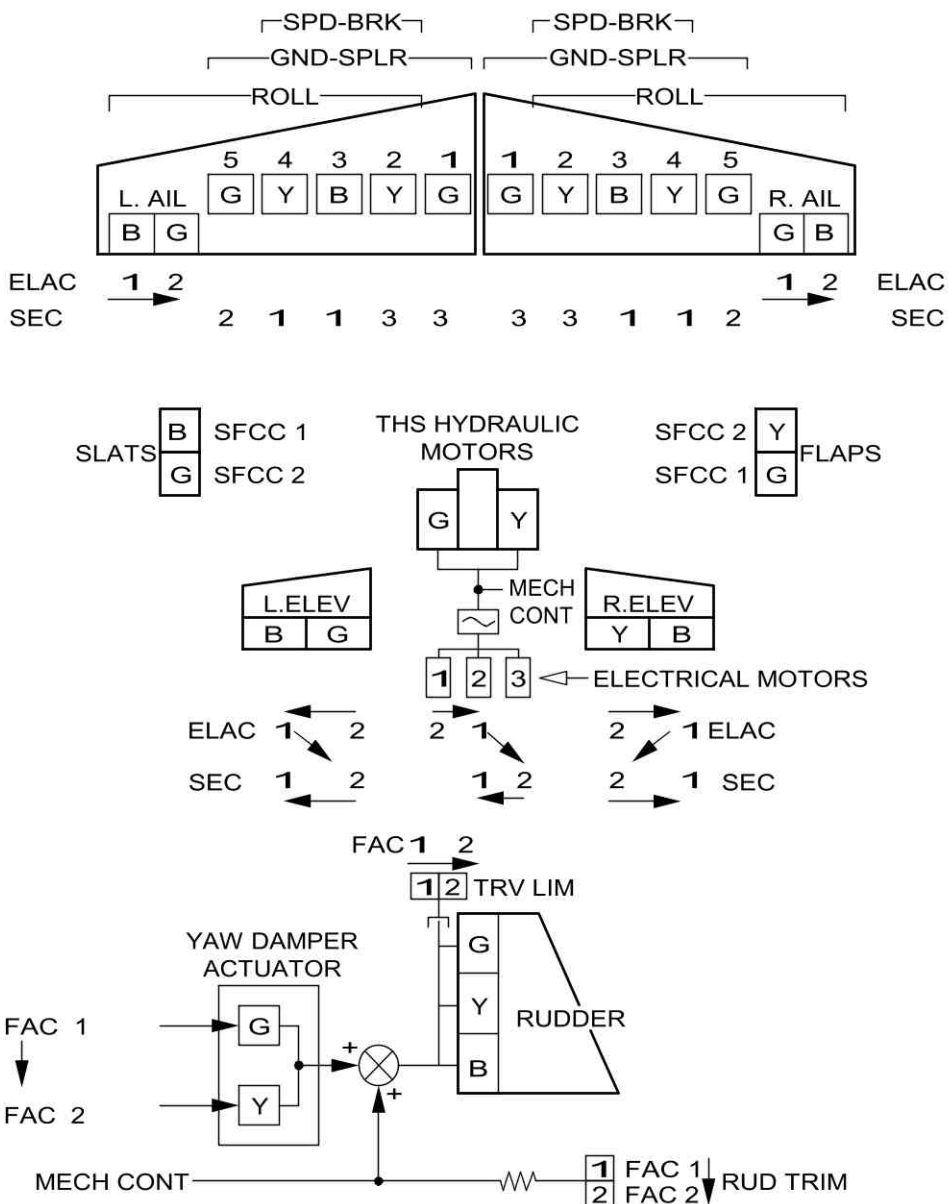
● **FOR APPROACH:**

A/THR in managed speed.....USE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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**OEBPROC-PLP PRELIMINARY PAGES**

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**OEBPROC-11 "ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight**

**"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight.. 11.00**  
**"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight.. 11.01**

**OEBPROC-30 No SRS Engagement During Go Around Below MDA**

**No SRS Engagement During Go Around Below MDA..... 30.00**  
**No SRS Engagement During Go Around Below MDA..... 30.01**

**OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

**Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....31.00**  
**Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....31.01**

**OEBPROC-38 Erroneous Radio Altimeter Height Indication**

**Erroneous Radio Altimeter Height Indication..... 38.00**  
**Erroneous Radio Altimeter Height Indication..... 38.01**

**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**


**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.00**  
**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.01**

**OEBPROC-43 F/CTL SPOILER FAULT**

**F/CTL SPOILER FAULT..... 43.00**  
**F/CTL SPOILER FAULT..... 43.01**

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

**L/G GEAR NOT DOWNLOCKED..... 44.00**  
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## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an **ENG 1(2) OIL FILTER CLOG** ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSI					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSI					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>30.00</b> 30 MAR 12
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## OEB30 Issue 1.0

# NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 188.

One Operator reported a case where the flight crew initiated a Go Around slightly below the Minimum Descent Altitude (MDA), and the aircraft did not pitch up as expected. The flight crew performed a non precision approach (a VORDME approach) using the FINAL APP managed guidance mode with the AP1 (Autopilot) engaged during the final approach.

This OEB is issued to provide flight crews with an operational procedure to avoid such aircraft behavior.

The operational procedure provided in this OEB applies to all Non Precision Approaches, for both conventional approaches and RNAV approaches, flown in FINAL APP managed guidance mode.

**Applicable to:**

All A318/A319/A320/A321 aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		30.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013526.0002001	30 MAR 12
Criteria: SA Applicable to: B-HSI					
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013527.0002001	30 MAR 12
Criteria: SA Applicable to: B-HSI					





## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

### ECAM ENTRY

None

### PROCEDURE

During a non precision approach, when using the FINAL APP managed guidance mode:

- **At DA(DH) or MDA(MDH), or earlier in approach if visual conditions are obtained:**

DISENGAGE the FINAL APP mode by pressing the APPR pushbutton on the FCU.

When the flight crew presses the APPR pb in order to disengage the FINAL APP managed guidance mode, a basic vertical guidance mode, either V/S or FPA, engages.

This ensures that the SRS and GA TRK guidance modes correctly engage, if the flight crew initiates a go-around slightly below MDA (MDH).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
Criteria: SA Applicable to: B-HSI					
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
Criteria: SA Applicable to: B-HSI					



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSI				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSI				





## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSI				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSI				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



<b>AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)</b>
--------------------------------------------------------------------------------

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).



## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSI				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSI				





## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSI				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSI				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

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		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSJ**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSJ</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HSJ</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HSJ</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSJ</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HSJ</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSJ</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSJ</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSJ</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
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<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-28	No Localizer or Glide Slope Capture in Approach	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
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M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSJ</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	1253	HDA 0002	B-HSJ	320-232

(1) Evolution code : N=New, R=Revised

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	1/6
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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	27-1189 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L94 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	27-1182 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L93 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
<b>Applicable to: ALL</b>				
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
<b>Applicable to: ALL</b>				
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
<b>Applicable to: ALL</b>				
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
<b>Applicable to: ALL</b>				
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
<b>Applicable to: ALL</b>				
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
<b>Applicable to: ALL</b>				
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
<b>Applicable to: ALL</b>				
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
<b>Applicable to: ALL</b>				
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
<b>Applicable to: ALL</b>				
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
<b>Applicable to: ALL</b>				
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
<b>Applicable to: ALL</b>				
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
<b>Applicable to: ALL</b>				
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
<b>Applicable to: ALL</b>				
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
<b>Applicable to: ALL</b>				
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF RAIN REPELLENT SYSTEM
<b>Applicable to: ALL</b>				
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
<b>Applicable to: ALL</b>				
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
<b>Applicable to: ALL</b>				
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
<b>Applicable to: ALL</b>				
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
<b>Applicable to: ALL</b>				
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
<b>Applicable to: ALL</b>				
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
<b>Applicable to: ALL</b>				
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
<b>Applicable to: ALL</b>				



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	Applicable to: ALL			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	32-1369 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INTRODUCE BSCU STD 10.1 - SB ONLY.
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	Applicable to: ALL			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	Applicable to: ALL			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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**GEN-PLP PRELIMINARY PAGES**

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Use of Summaries.....	GEN.02
General Information.....	GEN.03

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**

DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

# USE OF SUMMARIES

## GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES. These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

## APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

## APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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**ABN-PLP PRELIMINARY PAGES**

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**CABIN OVERPRESSURE.....21.01**

**ABN-22 Auto Flight**

**LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset).....22.01**

**LOW ENERGY WARNING.....22.02**

**ABN-24 Electrical**

**ELEC EMER CONFIG SYS Remaining..... 24.01**

**ELEC EMER CONFIG Summary.....24.02**

**ABN-25 Equipment**

**COCKPIT DOOR FAULT..... 25.01**

**ABN-26 Fire Protection**

**■ SMOKE/FUMES REMOVAL ■..... 26.01**

**■ SMOKE/FUMES/AVNCS SMOKE ■.....26.02**

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**ABN-29 Hydraulic**

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**HYD G + B SYS LO PR Summary..... 29.02**

**HYD G + Y SYS LO PR Summary.....29.03**

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■ Stall Recovery ■.....	80.07
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**VAPP Calculation.....80.14**

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**LDG CONF/APPR SPD/LDG DIST Table - DRY RWY.....80.16**

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**LDG CONF/APPR SPD/LDG DIST Table - CONTA RWY.....80.18**

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CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● If  $\Delta P > 9$  PSI

PACK 1+2.....OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.
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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		



**ELEC EMER CONFIG SYS REMAINING**

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



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ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a)

Restored, when speed is below 100 kt.

(b)

Crew oxygen valve inoperative.

(c)

Lost, when speed is below 50 kt.

(d)

Lost 30 s after last engine shutdown.

(e)

IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied


(f)

For APU start only.

(g)

Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.



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<b>ELEC EMER CONFIG SUMMARY</b>
---------------------------------

CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
<b>DRY Runway</b>	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● If one or more electrical latches (strikes) are faulty:

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● If two pressure sensors are faulty:

Automatic latch release is not available, in case of cockpit decompression.

● If no LED on the CKPT DOOR CONT panel is on:

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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SMOKE/FUMES REMOVAL

EMER EXIT LIGHT..... ON

● **If fuel vapors:**

CAB FANS..... ON

PACK 1+2..... OFF

● **If no fuel vapors:**

CAB FANS..... OFF

PACK FLOW..... HI

LDG ELEV..... 10 000 FT/MEA

DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude).....

ATC..... NOTIFY

SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE

*While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*

● **At FL 100 OR MEA:**

APU MASTER SW (if in ELEC EMER CONFIG)... ON

PACK 1+2..... OFF

MODE SEL..... MAN

MAN V/S CTL..... FULL UP

RAM AIR..... ON

APU MASTER SW..... OFF

● **If smoke persists, open CKPT window:**

MAX SPEED..... 200 KT

COCKPIT DOOR..... OPEN

HEADSETS..... ON

PNF COCKPIT WINDOW..... OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

## SMOKE/FUMES/AVNCS SMOKE

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER.....	OVRD
EXTRACT.....	OVRD
CAB FANS.....	OFF
GALY & CAB.....	OFF
SIGNS.....	ON
CKPT/CAB COM.....	ESTABLISH

● **IF REQUIRED:**

CREW OXY MASKS..... ON/100%/EMERG

● **IF SMOKE SOURCE IMMEDIATELY OBVIOUS,  
ACCESSIBLE, AND EXTINGUISHABLE:**

FAULTY EQPT..... ISOLATE

● **IF SMOKE SOURCE NOT IMMEDIATELY  
ISOLATE:**

DIVERSION..... INITIATE

DESCENT (FL 100, or MEA, or minimum obstacle  
clearance altitude)..... INITIATE

● **AT ANY TIME of the procedure, if SMOKE/FUMES  
becomes the GREATEST THREAT :**

SMOKE/FUMES REMOVAL..... CONSIDER

ELEC EMER CONFIG..... CONSIDER

*Refer to the end of the procedure to Set ELEC  
EMER CONFIG*

● **At ANY TIME of the procedure, if situation  
becomes UNMANAGEABLE :**

IMMEDIATE LANDING..... CONSIDER



## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

### AIR COND SMOKE/CAB EQUIPMENT SMOKE

● **IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 PACK 1..... OFF

● **If smoke continues:**

PACK 1..... ON  
 PACK 2..... OFF

● **If smoke still continues:**

PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

● **IF CAB EQUIPMENT SMOKE SUSPECTED:**

● **If smoke continues:**

EMER EXIT LIGHT..... ON  
 BUS TIE..... OFF  
 GEN 2..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE

● **If smoke still continues or if faulty  
equipment confirmed isolated:**

GEN 2..... ON  
 BUS TIE..... AUTO

● **If faulty equipment not confirmed isolated,  
before L/G extension:**

GEN 2..... ON







## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

BUS TIE.....AUTO

SMOKE/FUMES REMOVAL..... CONSIDER

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER

- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF

EMER ELEC PWR..... MAN ON

- WHEN EMER GEN AVAIL:

APU GEN.....OFF

GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- AT 3 min OR 2 000 ft AAL BEFORE LANDING:  
GEN 2..... ON  
EMER ELEC GEN 1 LINE..... ON

- WHEN A/C IS STOPPED:

ALL GEN..... OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


- Note:
- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
  - In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED

Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	200 kt		200 kt	185 kt	177 kt	
S > 3	177 kt		177 kt	177 kt	177 kt	

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM

CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

# STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

- IF MAN TRIM AVAIL:**  
 TRIM FOR NEUTRAL ELEV  
*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

## APPR PROC

- IF MAN TRIM NOT AVAIL:**  
 FOR LDG.....USE FLAP 3  
*Do not select configuration full so as not to degrade the handling qualities.*  
 GPWS LDG FLAP 3..... ON  
 CAT 2 INOP



FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON

- **On the lighter side and in the center tank:**  
FUEL PUMPS.....OFF
- **When fuel is balanced:**  
FUEL PUMPS (WING + CTR)..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.


FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



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**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*
- **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**  
 CTR TK PUMP 1+2..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147


APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	<i>Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75</i>								
<b>CONTA runway (CONF 3)</b>	<i>Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90</i>								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/0.77  
 MANEUVER WITH CARE  
 ALTN LAW : PROT LOST

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

### APPROACH

CAT 2 INOP  
 SLATS SLOW / FLAPS JAMMED  
 GPWS FLAP MODE..... OFF  
 ● **For Flaps extension:**  
 SPD SEL..... VFE NEXT - 5KT  
 When in landing CONF : DECELERATE TO CALCULATED VAPP  
 Stabilize at VAPP before L/G down, to be trimmed for approach.  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE:** PITCH AUTHORITY REDUCED (No stabilizer).  
 MAN TRIM Unusable  
 Only 1 spoiler per wing – Direct law  
**SPOILERS:** Only 1 per wing  
**NO REVERSER**  
**BRAKING:** BRK Y ACCU PR ONLY (7 applications)  
 MAX BRK PR 1 000 PSI  
**NO NOSEWHEEL STEERING**

### GO-AROUND

NO GEAR RETRACTION. Increased fuel consumption  
 ● **For circuit:**  
 MAINTAIN SLATS/FLAPS CONFIGURATION  
 Recommended speed: MAX SPD - 10 kt  
 ● **For diversion:**  
 ● **If Flaps at zero:**  
 SELECT CLEAN CONFIGURATION  
 Normal operating speeds  
 ● **If Flaps not at zero:**  
 MAINTAIN SLATS/FLAPS CONFIG  
 Recommended speed: MAX SPD - 10 kt


ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV										
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78	
<b>DRY runway</b>	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15									
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10									
<b>CORRECTIONS</b>	+ 1 000 ft above SL					+ 10 kt tailwind				
<b>DRY runway</b>	+ 3 %					+ 18 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1.....ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM.....CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START.....CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2.....ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM.....CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START.....CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected).....USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING.....AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*





## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <u>WHEEL</u> SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOME LT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.

Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.





## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW

### (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

..... PULL AND TURN


L/G LEVER..... DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT




ADR 1 + 2 + 3 FAULT (Cont'd)

- DURING FINAL APPR  
V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*

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## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.

- **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.

- **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.

- **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.

- **If not:**  
Deselect GPS and revert to basic information.

- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.





## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

■ **MCDU INITIALIZATION:**

- DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*
- IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*
- A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*

■ **CDU INITIALIZATION:**

- Depending on the CDU keyboard installed, an “H” may be written on the “5” key:
- **If “H” is written on the “5” key:**
- H KEY.....PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*
- A/C HEADING..... ENTER
- **If “H” is not written on the “5” key:**
- A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG–ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and  $V_{MAX}$ .*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

#### ■ If at least one ADR is reliable:

Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

#### ■ If affected ADR(s) cannot be identified or all ADRs are affected:

ONE ADR..... KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF..... USE FLAP 3

APP SPD..... VLS +10

LDG DIST PROC..... APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

#### ■ To return to departure airport:

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

#### ■ To accelerate and clean up after takeoff:

Accelerate and clean up the aircraft in level flight:

THRUST..... CLB

FLAPS..... RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	250 kt	10.0/CLB	10.5/CLB	11.5/CLB
FL 50 - FL 100		9.0/CLB	9.5/CLB	10.0/CLB
FL 100 - FL 150		8.0/CLB	8.5/CLB	8.5/CLB
FL 150 - FL 200		7.0/CLB	7.0/CLB	7.0/CLB
FL 200 - FL 250	275 kt	5.0/CLB	5.0/CLB	5.0/CLB
FL 250 - FL 320		4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200-FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

### DESCENT

Set the thrust to IDLE.


CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320-FL 200	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE
FL 200 - FL 100	250 kt	1.5/IDLE	0.5/IDLE	-0.5/IDLE
Below FL 100	250 kt	1.0/IDLE	0.0/IDLE	-1.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.5/IDLE	2.5/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 67 t	67 t - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.5/55.7	5.5/51.5	6.0/47.3
1	S	7.5/58.2	7.5/54.0	7.5/49.0
1+F <sup>(1)</sup>	S	4.5/60.2	4.5/56.1	4.5/51.2
2	F	9.0/61.7	9.0/57.3	9.0/52.8



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## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	7.5/67.2	7.5/62.7	7.5/57.9

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

LANDING GEAR DOWN				
		Above 67 t	67 t - 55 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	4.5/48.0	4.5/44.4	4.5/41.4

**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :
  - X BLEED..... CHECK OPEN
  - DESCENT TO FL200/MEA.....CONTINUE
  - Descend rapidly to FL 200, to recover the bleed supply from the APU*
  - APU.....START
  - Start the APU during the descent.*
  - **AT, OR BELOW, FL200 :**
    - WING A.ICE..... OFF
    - APU BLEED must not be used for wing anti-ice.*
    - APU BLEED..... ON
    - MAX FL200
    - AVOID ICING CONDITIONS
    - **IF ICE ACCRETION**
      - APPR SPD.....VLS + 10 KT
      - LDG DIST PROC..... APPLY
      - Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**

CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**

APU (IF AVAIL).....START

● **WHEN BELOW FL 200**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
GALY & CAB.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*



## ENG DUAL FAILURE - NO FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THRUST LEVERS..... IDLE  
FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....220 KT/GREEN DOT

*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1 /ATC1.....USE

ATC..... NOTIFY

CREW OXY MASKS (Above FL 100)..... ON

CABIN AND COCKPIT..... PREPARE

SIGNS..... ON

GALY & CAB..... OFF

USE RUDDER WITH CARE

### ● WHEN BELOW FL 150

RAM AIR..... ON

## COMMON ACTIONS FOR THE APPROACH

### APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).

BARO..... SET

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

## IF FORCED LANDING ANTICIPATED

### APPROACH

FOR LDG.....USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**


ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

  - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT





ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

## ENG RELIGHT (IN FLIGHT)

- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*

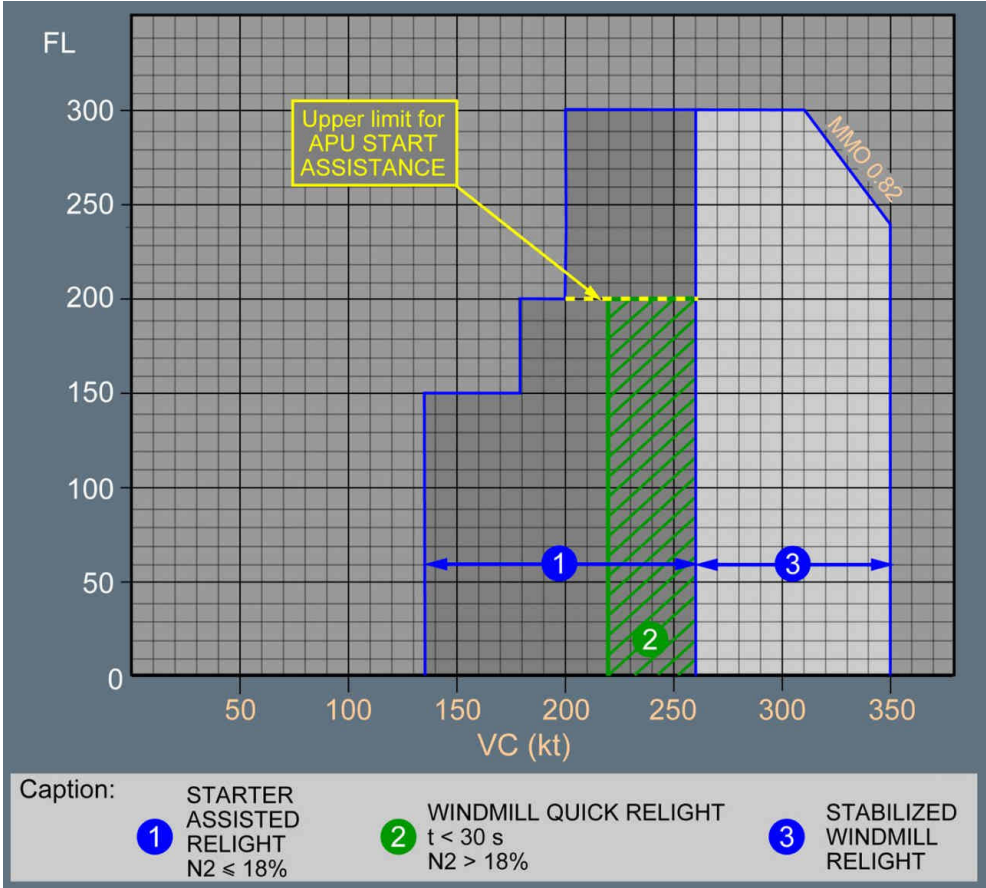
*Engine light up should be achieved within 30 s after fuel flow increases.*

■ **When idle is reached (AVAIL indication pulses in green) :**

- |                      |             |
|----------------------|-------------|
| ENG MODE SEL.....    | NORM        |
| TCAS MODE SEL  ..... | check TA/RA |
- Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*
- |                   |         |
|-------------------|---------|
| Affected SYS..... | RESTORE |
|-------------------|---------|

■ **If no relight :**

- |                            |     |
|----------------------------|-----|
| ENG MASTER (affected)..... | OFF |
|----------------------------|-----|
- Wait 30 s before attempting a new start (to drain the engine).*





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION

External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

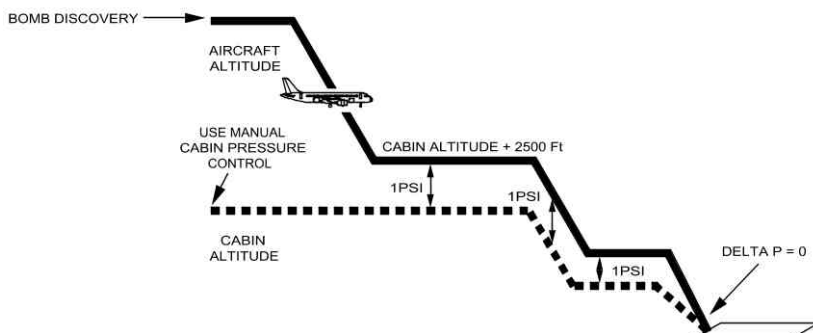
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN





## BOMB ON BOARD (Cont'd)

- **When at CAB ALT + 2 500 ft:**
  - 1 PSI DELTA P..... MAINTAIN
  - GALY & CAB.....OFF
  - FLAPS (fuel permitting)..... AT LEAST CONF 1
  - For landing, use normal configuration.*
  - LANDING GEAR (fuel permitting, except for flight over water).....DOWN
- **For any other steps of descent:**
  - 1 PSI DELTA P..... MAINTAIN
- **During approach:**
  - CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**
    - EVACUATION.....INITIATE
    - Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**
    - CABIN CREW and PASSENGERS (PA)..... NOTIFY

### **CABIN PROCEDURES**

If a suspect device is found in the cabin:

<b>WARNING</b>	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
<b>WARNING</b>	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
<b>CAUTION</b>	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

**EOD PERSONNEL ON BOARD.....CHECK**

*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

**BOMB.....DO NOT OPEN**

**BOMB.....DO NOT CUT WIRES**

**BOMB.....SECURE AGAINST SLIPPING**

**BOMB.....AVOID SHOCKS**

*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

**PASSENGERS.....LEAD AWAY FROM BOMB**

*Move passengers at least 4 seat rows away from the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*

*Seat backs and tray tables must be in their full upright position.*

*Service items may need to be collected in order to secure tray tables.*

**PORTABLE ELECTRONIC DEVICES..... SWITCH OFF**

*The cabin crews must command passengers to switch off all portable electronic devices.*



## BOMB ON BOARD (Cont'd)

### BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

### EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

### GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

#### ● If the bomb can be moved:

#### RH AFT CABIN DOOR SLIDE.....DISARM

#### LEAST RISK BOMB LOCATION (LRBL).....PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

### BOMB INDICATION LINE.....POSITION

Note: A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

### BOMB.....MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

**CAUTION** Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.

### LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

*Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.*





## BOMB ON BOARD (Cont'd)

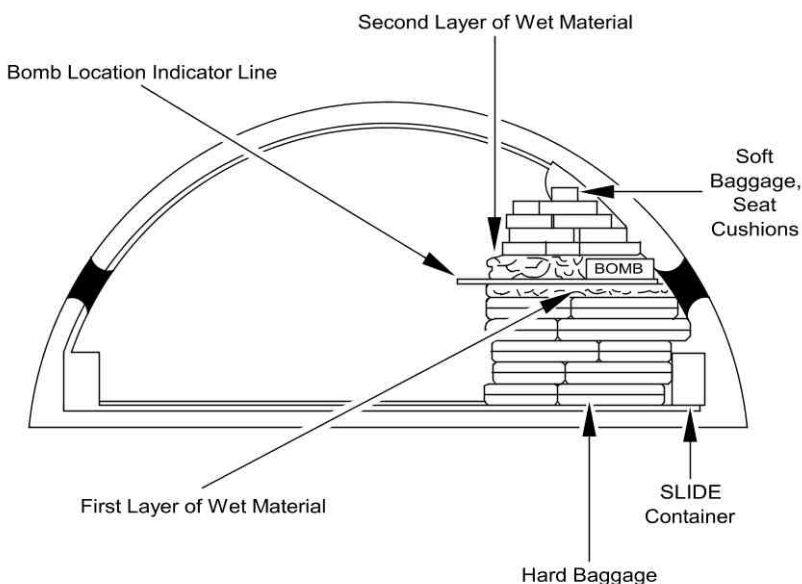
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



### PASSENGERS.....MOVE/ADVISE

*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

### CABIN CREW.....NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*

### EVACUATION/DISEMBARKATION.....EXECUTE

*Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".*

*Use all available airport facilities to disembark without delay.*

## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALY & CAB.....OFF

LDG ELEV..... SELECT 00

BARO..... SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU)..... DISCH

EVACUATION..... INITIATE



## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

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- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALY & CAB.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### APPROACH

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### AT 2 000 FT AGL

CABIN.....NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT.....ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

#### ● When aircraft has stopped:

PARKING BRK.....ON

ATC (VHF 1).....NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ If Evacuation required:

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)		
<div>■ If Evacuation not required: CABIN CREW and PASSENGERS (PA)..... NOTIFY</div>		



## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS..... ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*

### WHEN DESCENT ESTABLISHED


EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

#### CAUTION

*Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: *The recommendation is to descend with the autopilot engaged.  
Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.

LDG DIST.....CHECK  
PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.  
Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown

REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								





## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note: In case of lack of pitch down authority, reducing thrust may be necessary.

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF



## VOLCANIC ASH ENCOUNTER

● **If the aircraft enters a volcanic ash cloud:**

180 ° TURN..... INITIATE  
ATC..... NOTIFY  
A/THR..... OFF  
THRUST (conditions permitting).....REDUCE  
CREW OXYGEN MASKS.....ON/100 %/EMER  
CABIN CREW.....NOTIFY  
PASSENGER OXYGEN.....AS RQRD  
ENG ANTI ICE..... ON  
WING ANTI ICE..... ON  
PACK FLOW..... HI

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

APU..... START  
ENGINE PARAMETERS..... MONITOR  
AIRSPEED INDICATIONS.....MONITOR

If airspeed is unreliable or lost, Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... FULL UP

Due to the increased noise level, pay particular attention to visual warnings.

## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

Note: When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● **Before takeoff**

Delay takeoff, or select the most favorable runway.

##### ● **During the takeoff run**

Reject takeoff.

Note: Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● **When airborne**

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha_{prot}$ .
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha_{prot}$ .
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ **Before TAKEOFF**

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note:    - *When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.*  
               - *In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.*

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.


#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note:    1. *If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.*  
               2. *If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.*



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## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM  
 AP (if engaged).....KEEP  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

**DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.**

**CLOSELY MONITOR FLIGHT PATH AND SPEED.**

**RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.**

WINDSHIELD/WINDOW ARCING

Affected WINDOW/WINDSHIELD ANTI ICE C/B..... PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)

**WINDSHIELD/WINDOW CRACKED**

DIAGNOSIS OF INNER PLY.....PERFORM  
*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation  
*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL..... 230/MEA  
*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain ΔP 5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note:    *The following procedure allows maintaining ΔP 5 PSI in manual cabin pressure mode.*

CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

ΔP = 5 PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**

CAB PRESS MODE SEL..... AUTO

Note:    *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL.....FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*



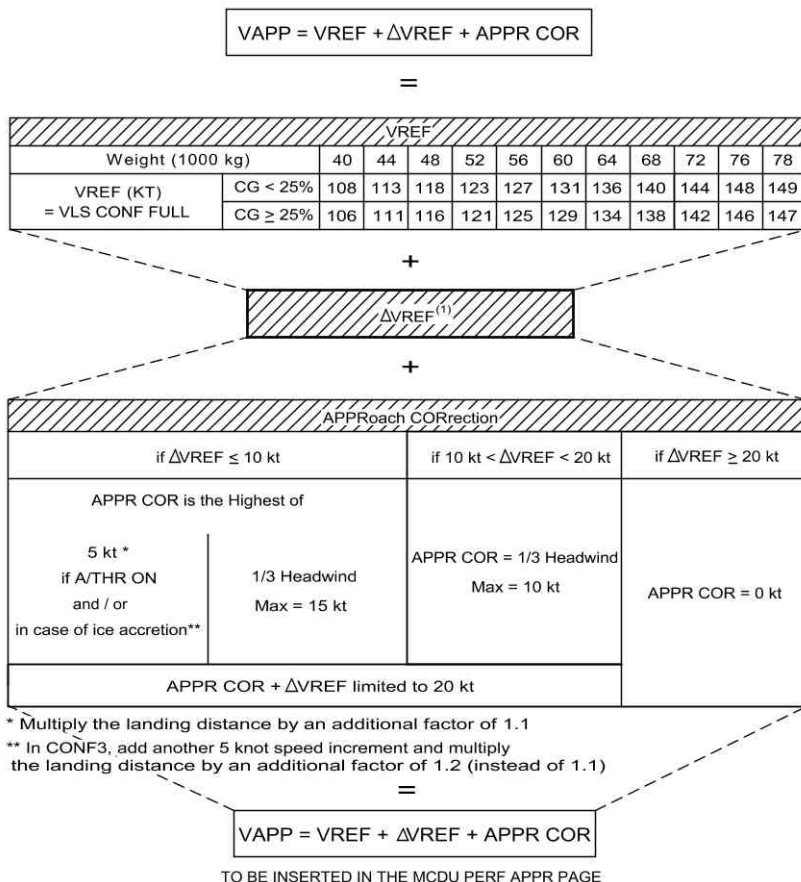


**ECAM ADVISORY CONDITIONS**

SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG</u> OIL LO PR warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> <p>In both cases, monitor other engine parameters, especially oil temperature and oil quantity.</p>
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	<p>An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.</p> <p><u>Note:</u> If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</p> <p>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</p> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).

## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:

Failure : ALTN LAW  
 Flight Conditions : Autothrust ON, ice accretion  
 Landing Configuration : CONF 3  
 Headwind : 12 kt  
 Landing Weight/CG : 48 t/25 %  
 VREF determined from the landing weight : 116 kt  
 VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- 5+5 = 10 kt (ice accretion and landing in CONF 3)
- 1/3 Headwind = 12 kt/3 = 4 kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136$  kt

<b>USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES</b>
---------------------------------------------------------

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors “WITHOUT REV”** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors “WITH REV”** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:     *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
RESULT	3	10			1.40×1.90×1.1=3.00

VREF = 131 kt. Therefore VAPP = 131 + 10 + 5 = 146 kt.

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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	25			1.95*
RESULT	3	25			1.95


VREF = 140 kt. Therefore VAPP =140+25 =165 kt



**LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY**

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.



**LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY**

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
	IR 1+2+3 FAULT	3	10	1.85	1.85
NAV	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.40*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.00*	1.90*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25

- <sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- <sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- <sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- <sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.
- <sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)





**LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY**

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*



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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
	IR 1+2+3 FAULT	3	10	1.45	1.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.35*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK / X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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### COMPUTER RESET

When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor.

The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.



<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
22	AUTO FLT FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table border="1"><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table border="1"><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table border="1"><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><b>Note:</b></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the 3 C/B:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li><li>• Channel 1 and 2 (L26 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the 3 C/B.</li></ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		







*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><b>Note:</b> After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><b>Note:</b> After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><b>Note:</b> After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1: <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2: <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>
34	<u>NAV</u> TCAS FAULT	TCAS	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
46	ATSU Malfunction	ATSU	<p>An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.</p> <p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li><li>- Wait 5 s, then:</li><li>- Push the C/Bs in the following order: L15, L16.</li></ul>

# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

# CONTAMINATED RUNWAY OPERATIONS

● **TAKEOFF**

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

● **MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING**

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note:     The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

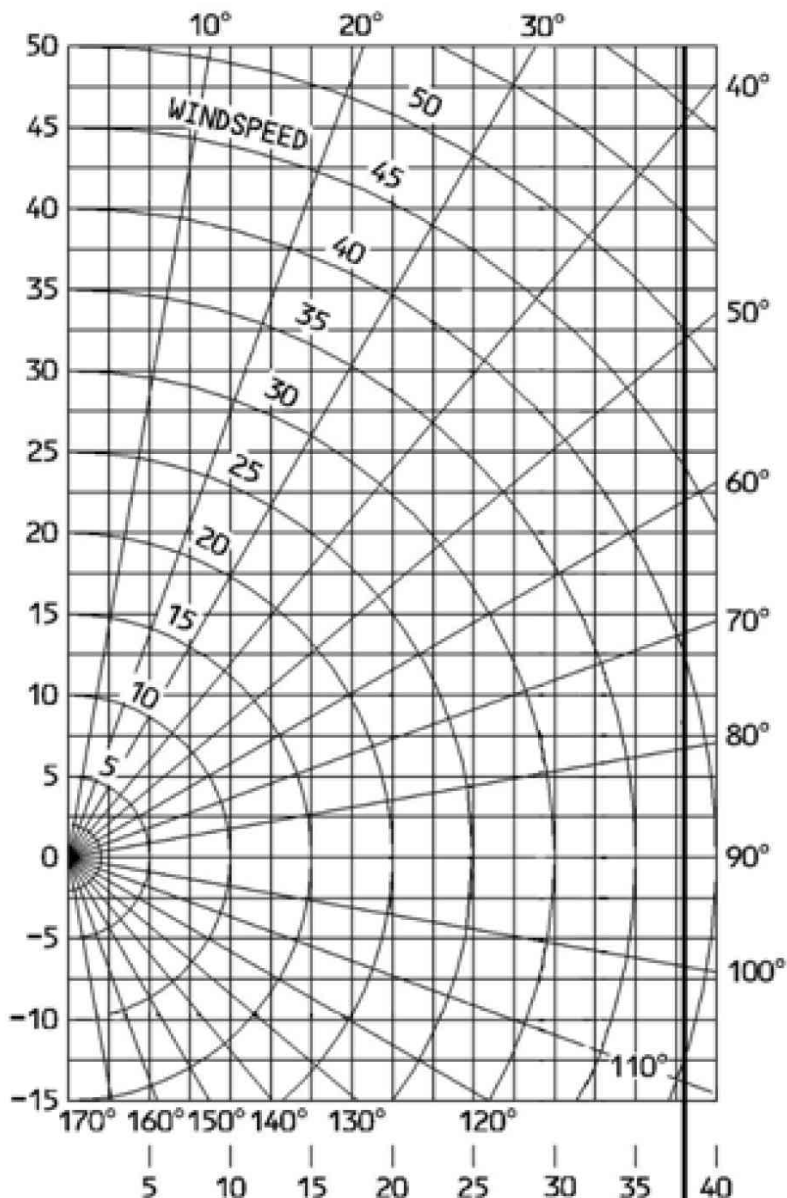
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320

SYS	FAILURE		CODE	SYS	FAILURE		CODE
ELEC	AC BUS 1		01	HYD	GREEN		01
	DC BUS 2		02		BLUE		02
	DC ESS BUS if there is no ice accretion		03		YELLOW		03
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05
	DC EMER CONFIG		06		BLUE + YELLOW		06
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01
	EMER ELEC CONFIG		08				
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02
		S ≥ 1	03	NAV	IR 1+2+3 FAULT		01
	1 ≤ FLAPS < 2	S < 1	04		UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02
		S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT		03
	2 ≤ FLAPS < 3	S < 1	06	BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01
		S ≥ 1	07				
	FLAP = 3	S < 1	08	ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	09		REV UNLOCK with buffet (CONF 3)		02
		S > 3	10		SHUTDOWN with ENG FIRE pb pushed and ice accretion		03
	FLAP > 3	S < 1	11				
		1 ≤ S ≤ 3	12				
		S > 3	13				
F/CTL	ONE SPLR FAULT		01				
	TWO SPLR FAULT		02				
	THREE SPLR FAULT		03				
	ALL SPLR FAULT/GND SPLR FAULT		04				
	SEC 1 or SEC 3 FAULT		05				
	SEC 2 FAULT		06				
	SEC 2 + 3 FAULT		07				
	SEC 1 + 3 FAULT		08				
	SEC 1 + 2 FAULT		09				
	RUDDER JAM		10				
	SEC 1 + 2 + 3 FAULT		11				
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12				

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	COMPANY PROCEDURES	CP-FAIL <b>2/2</b>
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**IN FLIGHT PERFORMANCE**

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**SPEEDS**

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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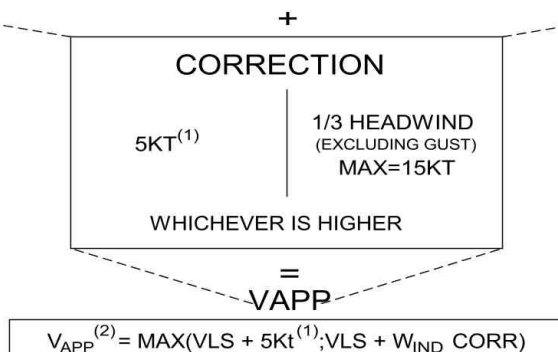
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

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LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %	+16 %	+24 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+3 %
2 reversers operative	-5 %	-12 %	-15 %	-14 %	-12 %	-27 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note:    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 x 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 x 1.06 x 1.08 = 1 020 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:*    - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

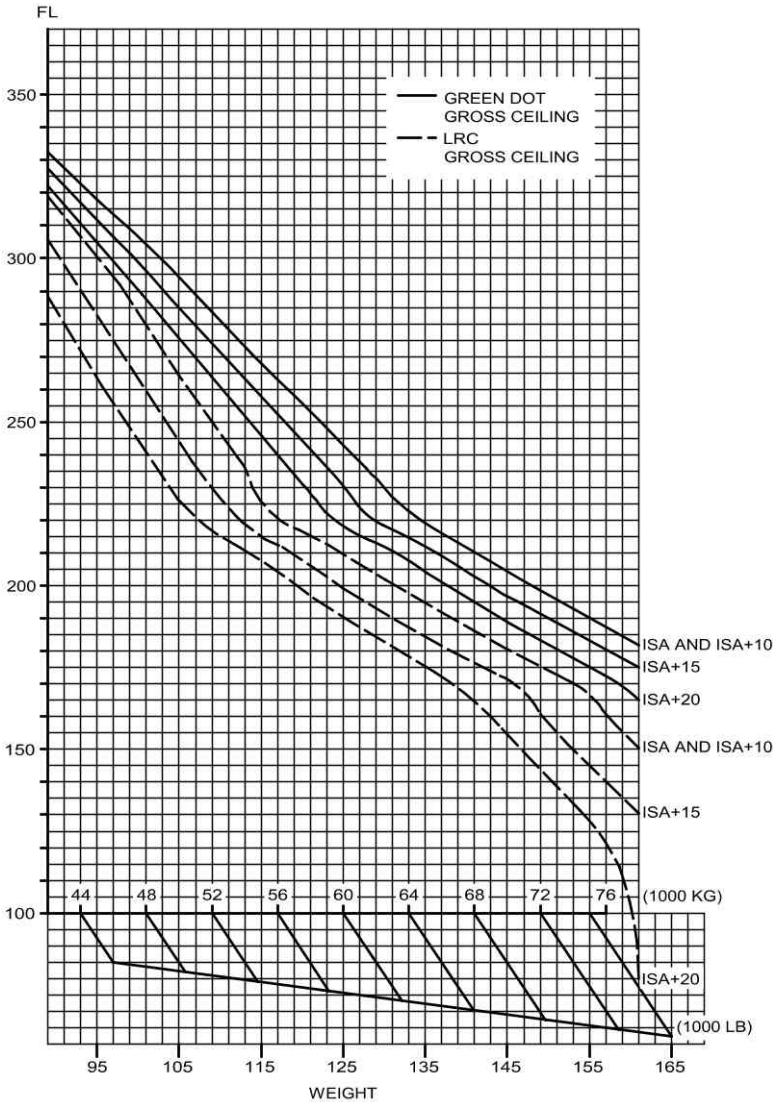
- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).



CEILINGS

ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT											
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)			
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)			
ANTI ICE OFF								LEVEL OFF (FT)			
INIT. GW	INITIAL FLIGHT LEVEL										
(1000KG)	250	290	310	330	350	370	390				
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200				
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300				
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200				
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200				
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600				
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100				
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800				
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400				
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100				
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600				
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000					
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400					
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800					
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200					
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600						
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON					
FUEL		+ 14 %				+ 28 %					
TIME		+ 13 %				+ 26 %					
DISTANCE		+ 12 %				+ 23 %					
LEVEL OFF		- 700 ft				- 1800 ft					

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## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT								
MAX. CONTINUOUS THRUST LIMITS			ISA	EPR	MACH			
PACK FLOW HI			CG=33.0%	FUEL FLOW (KG/H)	IAS (KT)			
ANTI-ICING OFF								
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250		
50	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584		
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241		
52	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594		
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246		
54	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602		
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249		
56	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600		
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248		
58	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585		
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242		
60	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562		
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232		
62	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570			
	2434 285	2287 272	2225 266	2248 268	2055 246			
64	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544			
	2454 284	2382 279	2317 272	2272 267	2037 234			
66	1.243 .513	1.322 .556	1.397 .591	1.421 .585				
	2476 284	2432 281	2399 277	2264 263				
68	1.247 .512	1.330 .558	1.412 .599	1.426 .570				
	2499 283	2472 282	2473 280	2253 256				
70	1.254 .514	1.338 .560	1.426 .604	1.436 .543				
	2550 285	2516 283	2537 283	2232 243				
72	1.262 .517	1.351 .567	1.428 .598					
	2604 287	2592 286	2533 280					
74	1.270 .521	1.365 .575	1.432 .587					
	2666 289	2673 290	2523 274					
76	1.290 .539	1.381 .585	1.438 .571					
	2805 299	2767 296	2509 267					
78	1.308 .554	1.395 .593	1.450 .537					
	2927 307	2850 300	2478 250					
ENGINE ANTI ICE ON				TOTAL ANTI ICE ON				
△FUEL = + 2.5 %				△FUEL = + 6 %				

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**IN CRUISE QUICK CHECK LONG RANGE**

**ONE ENGINE OUT**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG PACK FLOW HI ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
						TIME (H.MIN)			
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %				TOTAL ANTI ICE ON △FUEL = + 6 %					

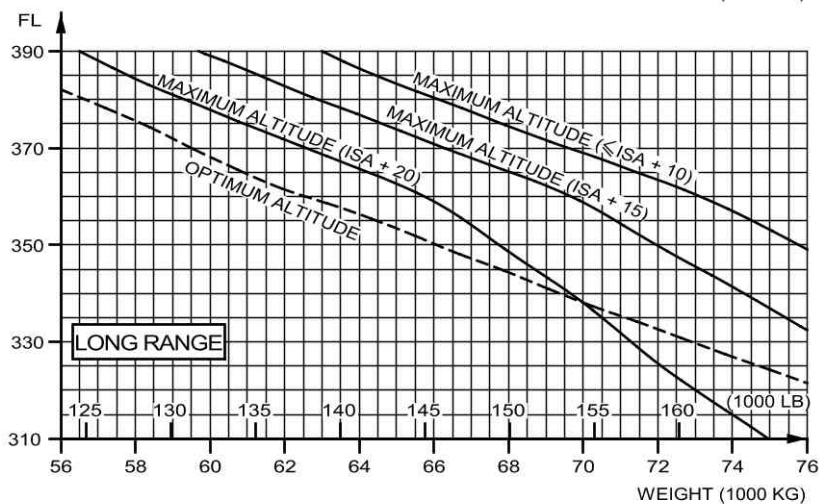
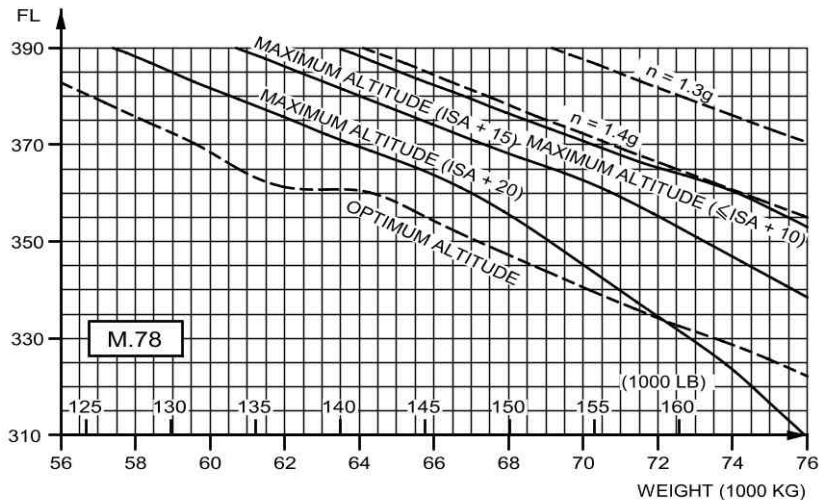
PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP
 CL-NO-04-08-140





## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

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## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

### ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)  TIME (H.MIN)			
AIR  DIST.  (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING ΔFUEL = - 0.4 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %			TOTAL ANTI ICE ON ΔFUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP

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## COST INDEX FOR LONG RANGE CRUISE SPEED

### ALL ENGINES

For a quick determination of the  $CI_{LRC}$ , use:

-  $CI_{LRC} = 40$  kg/min in the FMGC.

or

-  $CI_{LRC} = 55$  (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									
	45				65				
	TIME	FUEL	DIST.	EPR	TIME	FUEL	DIST.	EPR	IAS
FL	(MIN)	(KG)	(NM)		(MIN)	(KG)	(NM)		(KT)
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
							TIME (H.MIN)		
AIR DIST. (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 3 %			ΔFUEL = + 7 %			

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# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

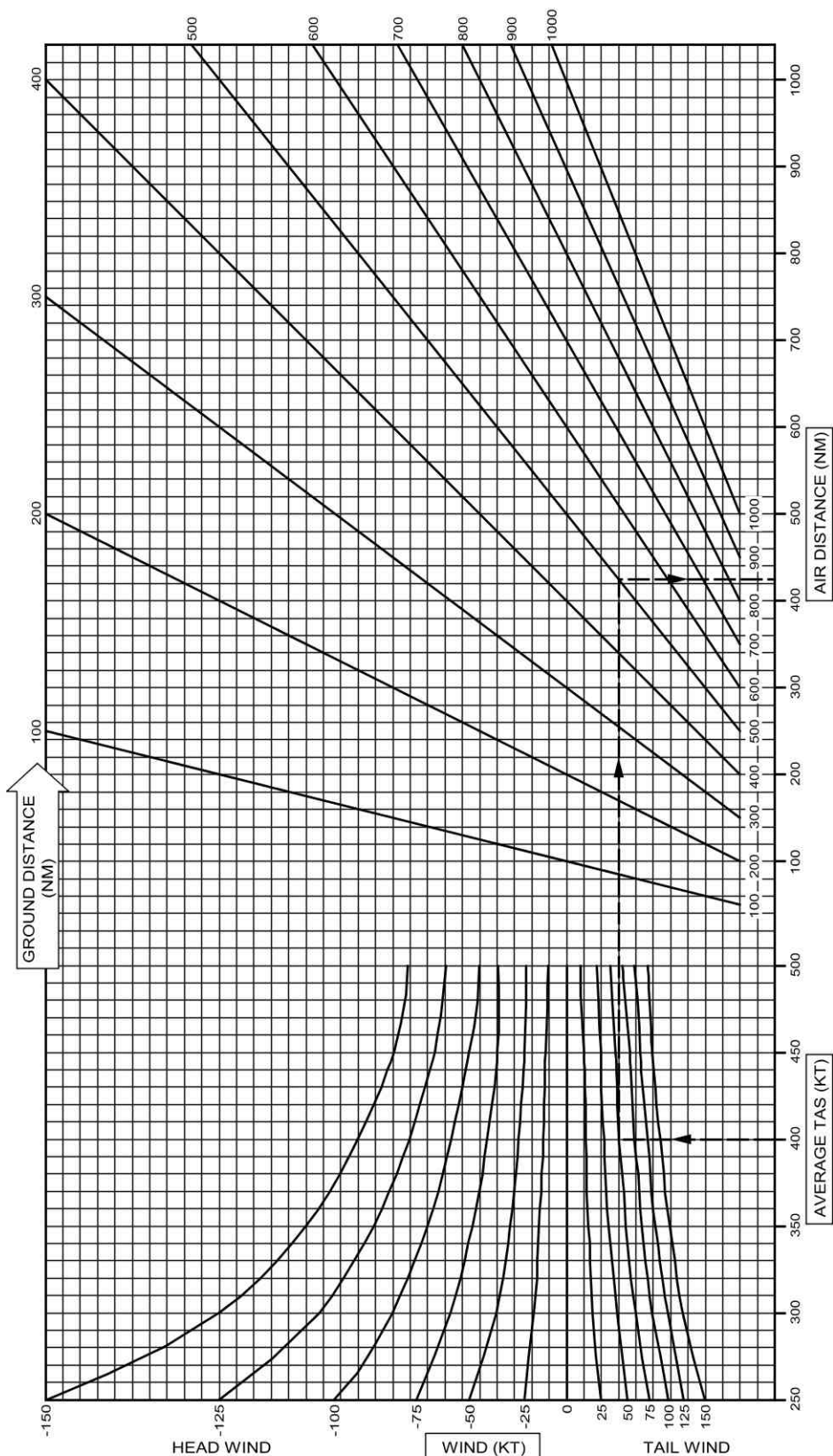
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING ANTI-icing OFF		ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46
260	1870 1.03	1936 1.00	2004 0.59	2074 0.57	2148 0.55	2222 0.52	2277 0.50
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.58	2396 0.55	2456 0.53
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.58	2634 0.56
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.59
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35
AIR CONDITIONING OFF ΔFUEL = - 1.5 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %		TOTAL ANTI ICE ON ΔFUEL = + 6 %		

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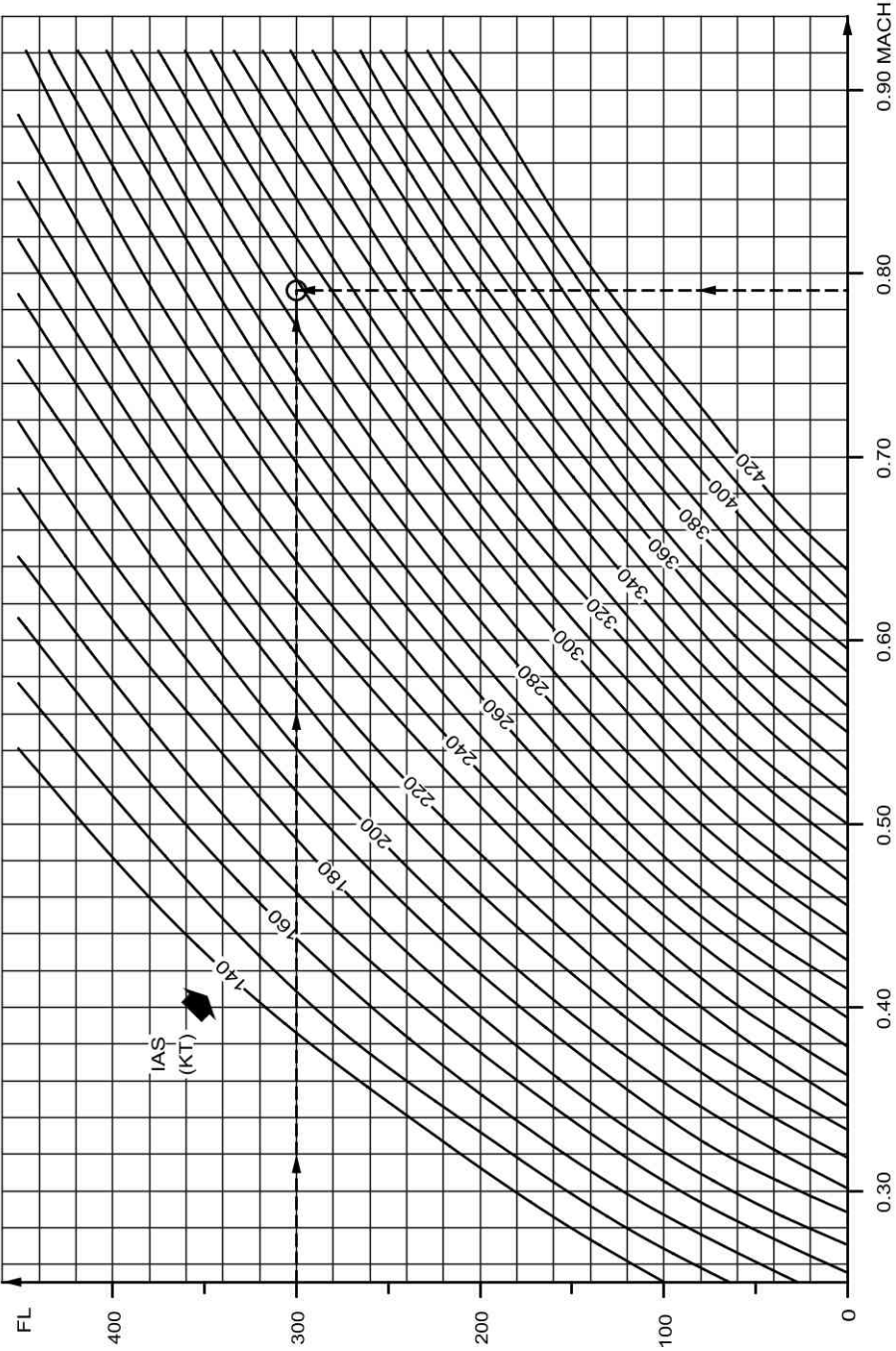
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**







## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEI condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

## FUEL PENALTY FACTORS/INOP SYS TABLE

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

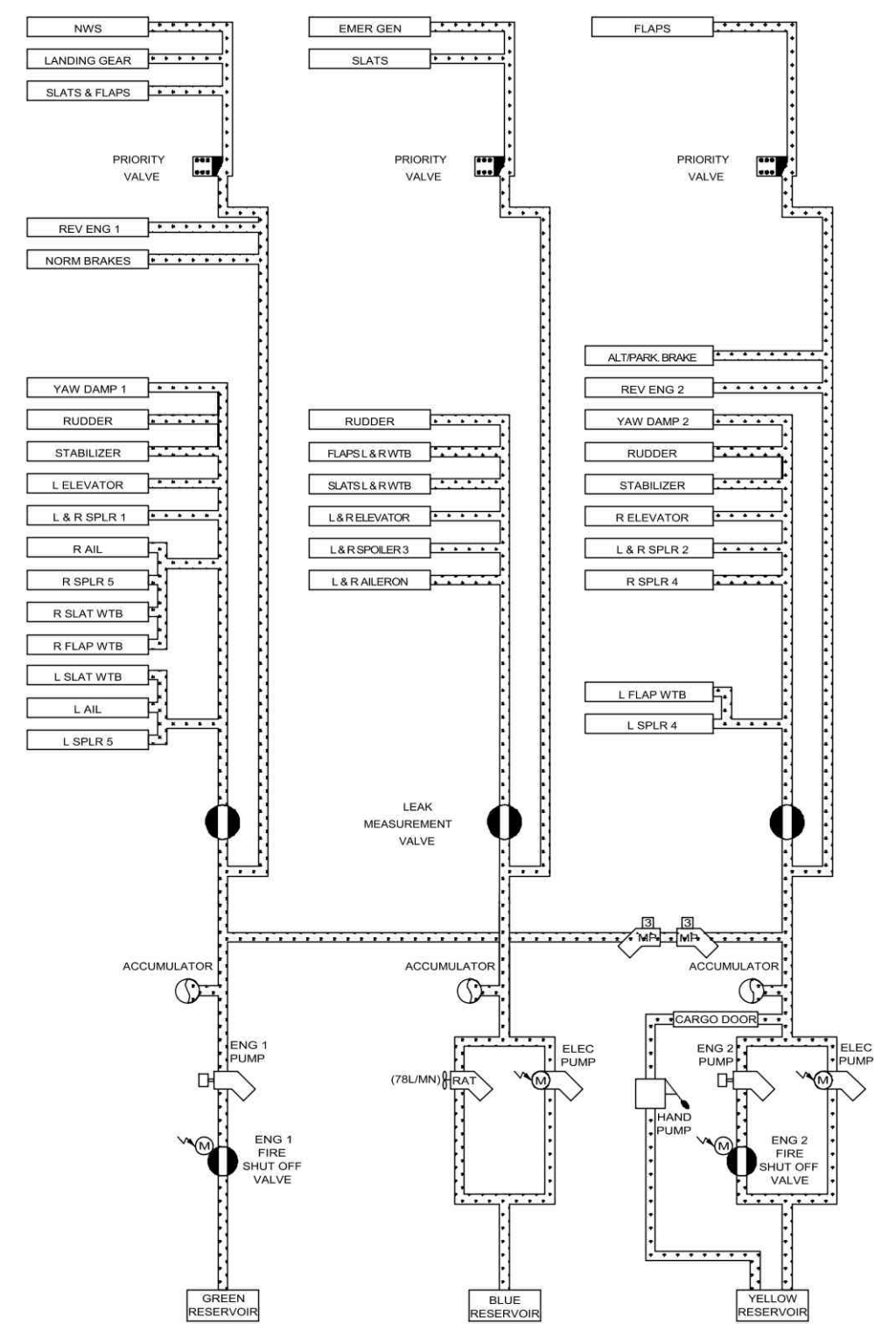
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

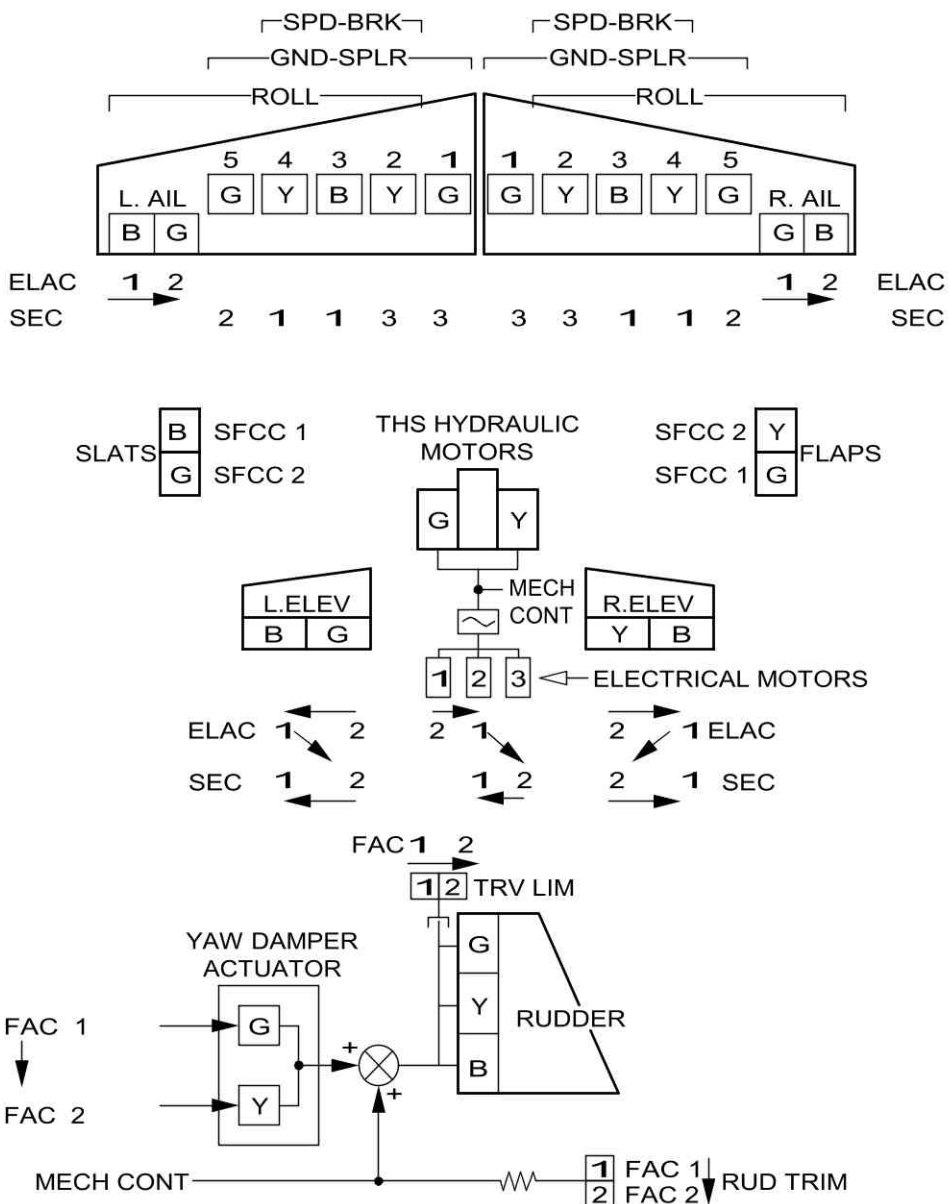
A/THR in managed speed.....USE

HYDRAULIC ARCHITECTURE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHURST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
ADR/IR	2/2	2/2	3/3	
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.



# **OPERATIONS ENGINEERING BULLETINS**

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## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an ENG 1(2) OIL FILTER CLOG ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		11.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSJ					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSJ					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side).....OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side).....OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED.....OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER.....IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		17.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSJ				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSJ				



## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## NO LOCALIZER OR GLIDE SLOPE CAPTURE IN APPROACH

Approved by: Head of Flight Operations Support and Services

## Reason for issue:

This OEB replaces the A320 OEB 184.

Several Operators experienced the following event: LOC\* (G/S\*) capture mode did not engage when intercepting the localizer (glide slope) during an ILS approach.


This OEB provides an explanation of the above-mentioned event, as well as the operational recommendations that the flight crew should apply, in order to intercept the ILS using LOC and G/S modes.

**Applicable to:**

Aircraft with Rockwell Collins Multi-Mode Receiver (MMR), P/N 822-1152-121 (MOD 26999 or MOD 30631)

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

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## NO LOCALIZER OR GLIDE SLOPE CAPTURE IN APPROACH

### ECAM ENTRY

None

### PROCEDURE

In accordance with the FCOM Standard Operating Procedures (*Refer to FCOM/PRO-NOR-SOP-18 ILS Approach Pattern*), the flight crew should closely monitor the localizer and glide slope capture, for every ILS approach.

- **If LOC\* mode does not engage when expected, the flight crew should:**

Perform the ILS interception using the LOC raw data deviations. The FD and AP can be used in selected modes (HDG-V/S modes, or preferably TRK-FPA modes) for this purpose.

Consider changing the Master FMGC:

- **If the AP is engaged:**

Change the AP in command

*(If AP1+2 are engaged, change to AP2, by pressing the AP1 pb on the FCU to disengage AP1)*

- **If the AP is disengaged, and the FDs are engaged:**

Turn off FD1

Then, attempt to reengage the LOC and G/S modes, by pressing the APPR pb.

LOC\* (G/S\*) mode should engage as expected, and the ILS can then be flown in LOC and G/S modes. However, the flight crew should disregard the approach capability on the FMA, and perform only a CAT I approach with a manual landing.

Note: *If it is still not possible to intercept the ILS after changing the Master FMGC, the flight crew must perform an ILS approach using raw data. The AP/FD can be used in selected modes (HDG/VS, or preferably TRK/FPA). The flight crew should disarm the APPR (LOC) mode(s) by setting the APPR (LOC) pb to OFF on the FCU, and then perform a CAT I approach with a manual landing.*

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSJ				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSJ				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## **OEB36 Issue 1.0**

# **NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT**

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		36.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSJ					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSJ					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### ECAM ENTRY

ENG 1(2) EPR MODE FAULT

### PROCEDURE

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

### ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSJ				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSJ				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	BLANK
		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSJ				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSJ				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



<b>AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)</b>
--------------------------------------------------------------------------------

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).





## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSJ				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSJ				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above  $V_{FE_{NEXT}}$ , the flight crew should deselect A/THR, decelerate to  $V_{FE_{NEXT}}$ , and select CONF 1 when below  $V_{FE_{NEXT}}$ . When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... $V_{REF} + 10KT$

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers.....x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSJ				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSJ				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	BLANK
		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSK**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date

No filing instructions


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSK</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HSK</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HSK</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSK</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HSK</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSK</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSK</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSK</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSK</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:

- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.


M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	1721	HDA 0056	B-HSK	320-232

(1) Evolution code : N=New, R=Revised


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	1/6
		30 MAR 12


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>2/6</b>
		30 MAR 12


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	<b>Applicable to: ALL</b>			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	<b>Applicable to: ALL</b>			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	<b>Applicable to: ALL</b>			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	<b>Applicable to: ALL</b>			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	<b>Applicable to: ALL</b>			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	<b>Applicable to: ALL</b>			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	<b>Applicable to: ALL</b>			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	<b>Applicable to: ALL</b>			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	<b>Applicable to: ALL</b>			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	<b>Applicable to: ALL</b>			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	<b>Applicable to: ALL</b>			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	<b>Applicable to: ALL</b>			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	<b>Applicable to: ALL</b>			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			


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	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			
	K7727		30 AUG 10	EQUIPMENT/FURNISHINGS - MISCELLANEOUS EMERGENCY EQPT - INSTALL AN HONEYWELL ELT WITH CONTROL PANEL IN COCKPIT
	Applicable to: ALL			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	Applicable to: ALL			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	Applicable to: ALL			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	Applicable to: ALL			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	Applicable to: ALL			

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	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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IMPORTANT		

### **SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
 As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

### **TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

#### **PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

#### **PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

### **Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

### **ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

### **ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

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## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : Index of the back cover page interior                                                                                           |
| C3              | : Index of the back cover page exterior                                                                                           |
| "BLANK"         | : Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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**ELEC EMER CONFIG Summary.....24.02**

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## CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

LAND ASAP

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.
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## LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### ■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:

#### ● When the system has recovered:

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### ■ DESCENT (IF TIME PERMITS) :

#### ● When the system has recovered:

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		





**ELEC EMER CONFIG SYS REMAINING**

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



Continued from the previous page

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a)

Restored, when speed is below 100 kt.

(b)

Crew oxygen valve inoperative.

(c)

Lost, when speed is below 50 kt.

(d)

Lost 30 s after last engine shutdown.

(e)


IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f)

For APU start only.

(g)

Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
<b>DRY Runway</b>	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● If one or more electrical latches (strikes) are faulty:

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:


COCKPIT DOOR sw..... SET to NORM

● If two pressure sensors are faulty:

Automatic latch release is not available, in case of cockpit decompression.

● If no LED on the CKPT DOOR CONT panel is on:

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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SMOKE/FUMES REMOVAL

EMER EXIT LIGHT..... ON

● **If fuel vapors:**

CAB FANS..... ON

PACK 1+2..... OFF

● **If no fuel vapors:**

CAB FANS..... OFF

PACK FLOW..... HI

LDG ELEV..... 10 000 FT/MEA

DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

ATC..... NOTIFY

SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE

*While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*

● **At FL 100 OR MEA:**

APU MASTER SW (if in ELEC EMER CONFIG)... ON

PACK 1+2..... OFF

MODE SEL..... MAN

MAN V/S CTL..... FULL UP

RAM AIR..... ON

APU MASTER SW..... OFF

● **If smoke persists, open CKPT window:**

MAX SPEED..... 200 KT

COCKPIT DOOR..... OPEN

HEADSETS..... ON

PNF COCKPIT WINDOW..... OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE



**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

- **IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMERG
- **IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT..... ISOLATE
- **IF SMOKE SOURCE NOT IMMEDIATELY ISOLATE:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

● **AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL.....CONSIDER  
 ELEC EMER CONFIG.....CONSIDER  
*Refer to the end of the procedure to Set ELEC EMER CONFIG*

● **At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING.....CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

**● IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
BLOWER..... AUTO  
EXTRACT..... AUTO  
PACK 1..... OFF

**● If smoke continues:**

PACK 1..... ON  
PACK 2..... OFF

**● If smoke still continues:**

PACK 2..... ON  
BLOWER..... OVRD  
EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

**● IF CAB EQUIPMENT SMOKE SUSPECTED:**

**● If smoke continues:**

EMER EXIT LIGHT..... ON  
COMMERCIAL..... OFF  
SMOKE DISSIPATION..... CHECK  
FAULTY EQPT..... SEARCH/ISOLATE

**● If smoke still continues or if faulty  
equipment confirmed isolated:**

COMMERCIAL..... NORM

SMOKE/FUMES REMOVAL..... CONSIDER





## **SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

### **UNDETERMINED/AVNCS/ELECTRICAL SMOKE**

- **IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:**  
ELEC EMER CONFIG..... CONSIDER
- **IF SMOKE DISAPPEARS WITHIN 5 MINUTES:**  
NORMAL VENTILATION..... RESTORE

### **TO SET ELEC EMER CONFIG**

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

- **WHEN EMER GEN AVAIL:**

APU GEN.....OFF  
GEN 2..... OFF

### **ELEC EMER CONFIG**

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- **AT 3 min OR 2 000 ft AAL BEFORE LANDING:**  
GEN 2..... ON  
EMER ELEC GEN 1 LINE.....ON

- **WHEN A/C IS STOPPED:**

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION


Recommended speed for diversion: MAX SPEED -10 kt

- Note:
- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
  - In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED						
Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	200 kt		200 kt	185 kt	177 kt	
S > 3	177 kt		177 kt	177 kt	177 kt	

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM

CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL





## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

## STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

- **IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

- **IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP

FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON

- **On the lighter side and in the center tank:**  
FUEL PUMPS.....OFF
- **When fuel is balanced:**  
FUEL PUMPS (WING + CTR)..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.


FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



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**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*
- **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**  
 CTR TK PUMP 1+2..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147


APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	<i>Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75</i>								
<b>CONTA runway (CONF 3)</b>	<i>Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90</i>								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	

GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	


ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).



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## HYD G + Y SYS LO PR SUMMARY

CRUISE											
MAX SPD.....											320/0.77
MANEUVER WITH CARE											
ALTN LAW : PROT LOST											
LANDING CONF						APPROACH SPEED					
Use FLAP 3						VAPP = VREF + 25 kt					

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH											
CAT 2 INOP											
SLATS SLOW / FLAPS JAMMED											
GPWS FLAP MODE.....											OFF
<b>● For Flaps extension:</b> SPD SEL..... VFE NEXT - 5KT											
When in landing CONF : DECELERATE TO CALCULATED VAPP											
Stabilize at VAPP before L/G down, to be trimmed for approach.											
L/G GRAVITY EXTENSION											

LANDING											
<b>FLARE:</b> PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law											
<b>SPOILERS:</b> Only 1 per wing											
<b>NO REVERSER</b>											
<b>BRAKING:</b> BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI											
<b>NO NOSEWHEEL STEERING</b>											


GO-AROUND											
NO GEAR RETRACTION. Increased fuel consumption											
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt											
<b>● For diversion:</b> <b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds <b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt											

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10								
CORRECTIONS	+ 1 000 ft above SL				+ 10 kt tailwind				
DRY runway	+ 3 %				+ 18 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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**DOUBLE AOA HEAT FAILURE**

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1.....ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM.....CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START.....CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2.....ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM.....CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START.....CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected).....USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING.....AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <b>L/G GEAR NOT DOWN</b> ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### **PREPARATION**

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### **APPROACH**

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### **BEFORE LANDING**

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOMELT.....DIM

### **FLARE, TOUCH DOWN AND ROLL OUT**

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.





## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN  
MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST  
following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT



ADR 1 + 2 + 3 FAULT (Cont'd)


- DURING FINAL APPR  
V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*



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## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

● **If the message occurs during ILS/LOC approach (LOC green):**

DISREGARD it.

● **If the message occurs in climb, cruise, or descent:**

CHECK navigation accuracy, using raw data.

■ **If the check is positive:**

NAV mode and ND ARC/ROSE NAV may be used.

■ **If the check is negative:**

HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

■ **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**

Use the associated FD/AP.

■ **If not:**

Deselect GPS and revert to basic information.

● **If the message occurs during a Non Precision Approach (NPA):**

■ **Overlay approach:**

SELECT HDG, or TRK, and use raw data.

■ **GPS or RNAV approach:**

GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

■ **MCDU INITIALIZATION:**

- DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*
- IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*
- A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*

■ **CDU INITIALIZATION:**

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

■ **If “H” is written on the “5” key:**

- H KEY.....PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*
- A/C HEADING..... ENTER

■ **If “H” is not written on the “5” key:**

- A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG–ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
----------------	-------------------------------------------------------------------------------------------------------------------------------------------------------

### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s).....OFF  
 REMAINING AIR DATA.....CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR.....KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs.....OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF.....USE FLAP 3

APP SPD.....VLS +10

LDG DIST PROC.....APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST.....CLB

FLAPS.....RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	250 kt	10.0/CLB	10.5/CLB	11.5/CLB
FL 50 - FL 100		9.0/CLB	9.5/CLB	10.0/CLB
FL 100 - FL 150		8.0/CLB	8.5/CLB	8.5/CLB
FL 150 - FL 200		7.0/CLB	7.0/CLB	7.0/CLB
FL 200 - FL 250	275 kt	5.0/CLB	5.0/CLB	5.0/CLB
FL 250 - FL 320		4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200-FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320-FL 200	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE
FL 200 - FL 100	250 kt	1.5/IDLE	0.5/IDLE	-0.5/IDLE
Below FL 100	250 kt	1.0/IDLE	0.0/IDLE	-1.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.5/IDLE	2.5/IDLE


### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 67 t	67 t - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.5/55.7	5.5/51.5	6.0/47.3
1	S	7.5/58.2	7.5/54.0	7.5/49.0
1+F <sup>(1)</sup>	S	4.5/60.2	4.5/56.1	4.5/51.2
2	F	9.0/61.7	9.0/57.3	9.0/52.8





 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>34.07C</b> 30 MAR 12
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## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	7.5/67.2	7.5/62.7	7.5/57.9

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

### FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 67 t	67 t - 55 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	4.5/48.0	4.5/44.4	4.5/41.4

**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :  
X BLEED..... CHECK OPEN  
DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
APU BLEED..... ON  
MAX FL200  
AVOID ICING CONDITIONS
- IF ICE ACCRETION  
APPR SPD.....VLS + 10 KT  
LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**

CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**

APU (IF AVAIL).....START

● **WHEN BELOW FL 200**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*





## ENG DUAL FAILURE - NO FUEL REMAINING

The flight crew should apply this paper procedure and then, if time permits, clear ECAM warnings and check the ECAM STATUS page.

THRUST LEVERS..... IDLE

FAC 1.....OFF THEN ON

*Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.*

OPTIMUM SPEED.....220 KT/GREEN DOT

*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

EMER ELEC POWER (if EMER GEN not in line).....MAN ON

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

CREW OXY MASKS (Above FL 100).....ON

CABIN AND COCKPIT.....PREPARE

SIGNS.....ON

COMMERCIAL.....OFF

USE RUDDER WITH CARE

### ● WHEN BELOW FL 150

RAM AIR..... ON

## COMMON ACTIONS FOR THE APPROACH

### APPROACH PREPARATION

Note: *Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).*

BARO..... SET

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

## IF FORCED LANDING ANTICIPATED

### APPROACH

FOR LDG.....USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**


ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

  - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF


AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

# **ENG RELIGHT (IN FLIGHT)**

- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

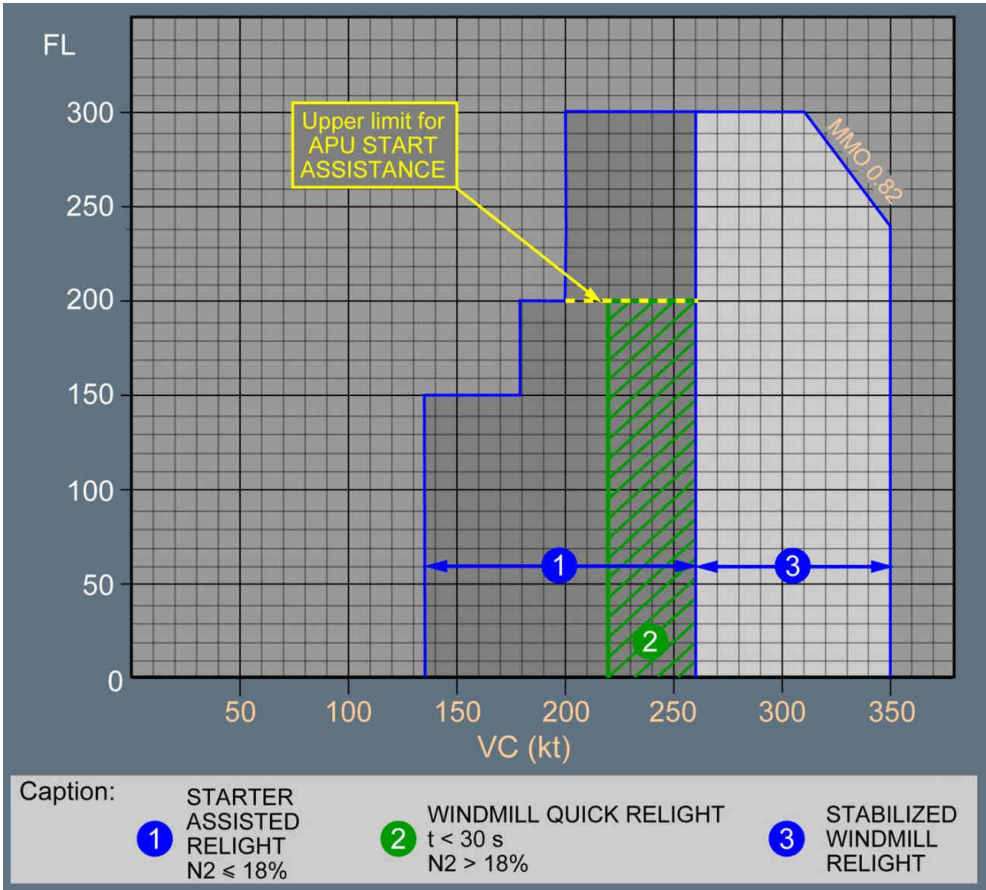
Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.  
 Engine light up should be achieved within 30 s after fuel flow increases.

■ **When idle is reached:**

- |                                                                                                       |             |
|-------------------------------------------------------------------------------------------------------|-------------|
| ENG MODE SEL.....                                                                                     | NORM        |
| TCAS MODE SEL  ..... | check TA/RA |
- Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.
- |                   |         |
|-------------------|---------|
| Affected SYS..... | RESTORE |
|-------------------|---------|

■ **If no relight:**

- |                            |     |
|----------------------------|-----|
| ENG MASTER (affected)..... | OFF |
|----------------------------|-----|
- Wait 30 s before attempting a new start (to drain the engine).





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
---------	---------------------------------------------------------------------------------------------------------------------------------------------

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

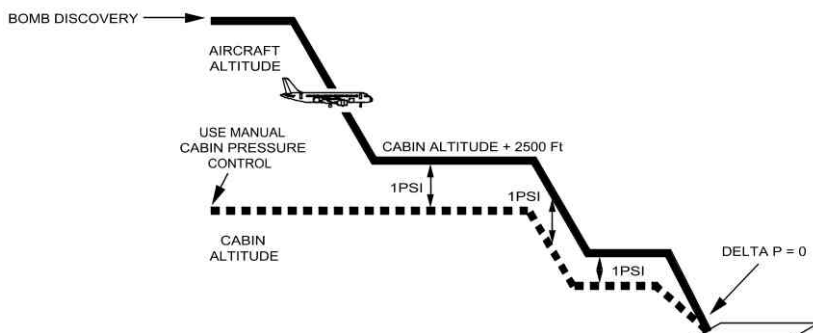
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE
<i>Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.</i>	
NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN
<i>Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.</i>	
DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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BOMB ON BOARD (Cont'd)

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

*The cabin crews must command passengers to switch off all portable electronic devices.*

BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

● If the bomb can be moved:

RH AFT CABIN DOOR SLIDE..... DISARM

LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

CAUTION

DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

BOMB INDICATION LINE..... POSITION

*Note:* *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

BOMB..... MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

CAUTION

Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.





## BOMB ON BOARD (Cont'd)

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

**CAUTION**

**DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.**

Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

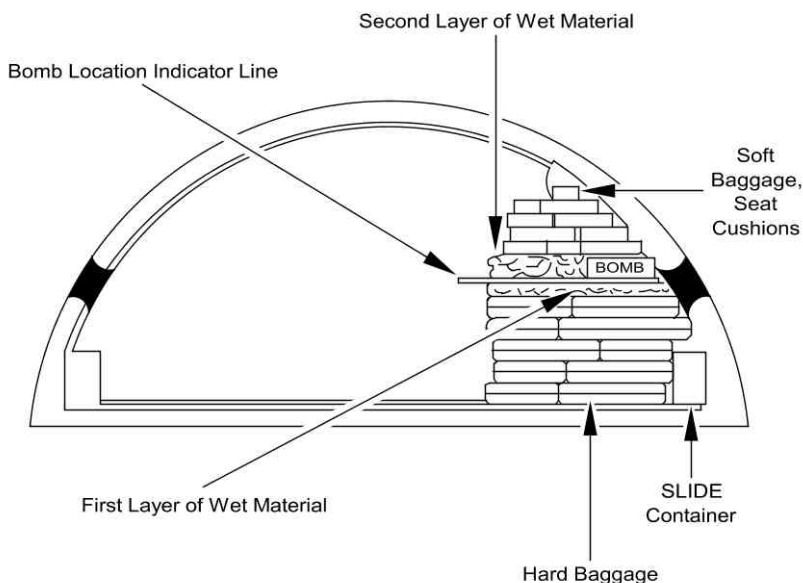
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



PASSENGERS.....MOVE/ADVISE


*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
<i>Evacuate through normal and emergency exits on the opposite side of the “bomb” location. Do not use the door just opposite the “bomb”.</i>		
<i>Use all available airport facilities to disembark without delay.</i>		



## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT.....ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE





	FORCED LANDING (Cont'd)	
--	-------------------------	--

ELT..... CHECK EMITTING <i>If not, switch on the transmitter.</i>		
■ <b>If Evacuation not required:</b>		
CABIN CREW and PASSENGERS (PA)..... NOTIFY		

## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


### WHEN DESCENT ESTABLISHED

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

**CAUTION** Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: The recommendation is to descend with the autopilot engaged.  
 Use of the autopilot is also permitted in EXPEDITE mode .

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● **In the final approach stages**

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.

Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● **At main landing gear touchdown**

REVERSE THRUST..... USE MAX AVAILABLE

● **After nosewheel touchdown**

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● **Landing complete**

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								

# STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

NOSE DOWN PITCH CONTROL..... APPLY  
*This will reduce angle of attack*

*Note:*     In case of lack of pitch down authority, reducing thrust may be necessary.

BANK..... WINGS LEVEL

● **When out of stall (no longer stall indications) :**

THRUST..... INCREASE SMOOTHLY AS NEEDED

*Note:*     In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

SPEEDBRAKES..... CHECK RETRACTED

FLIGHT PATH..... RECOVER SMOOTHLY

● **If in clean configuration and below 20 000 ft:**

FLAP 1..... SELECT

*Note:*     If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

# STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

THRUST..... TOGA

At the same time:

PITCH ATTITUDE..... 15 °

BANK..... WINGS LEVEL

*Note:*     When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.  
Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- If the aircraft enters a volcanic ash cloud:
 

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
PACK FLOW.....	HI

*Note:* If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

If airspeed is unreliable or lost,Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

*Note:* If all engines flame out and speed indications are lost,Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

*Note:* If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

Due to the increased noise level, pay particular attention to visual warnings.



## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.







## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*


Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

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WINDSHIELD/WINDOW ARCING		
<p>Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL</p> <p><i>Pull the circuit breaker of the affected window/windshield heating system, in case of :</i></p> <ul style="list-style-type: none"><li>- <i>Electrical arcing of the cockpit windshield/window, or</i></li><li>- <i>Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.</i></li></ul> <p><i>On the rear C/B panel :</i></p> <ul style="list-style-type: none"><li>• ANTI ICE L WSHLD C/B AF10 (123VU)</li><li>• ANTI ICE R WSHLD C/B AF03 (123VU)</li><li>• ANTI ICE/WINDOWS L C/B X14 (122VU)</li><li>• ANTI ICE/WINDOWS R C/B W14 (122VU)</li></ul>		



## WINDSHIELD/WINDOW CRACKED

**DIAGNOSIS OF INNER PLY.....PERFORM**

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

**MAX FL..... 230/MEA**

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

**CAB PRESS MODE SEL..... MAN**

**MAN V/S CTL..... AS RQRD**

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


**CAB PRESS MODE SEL..... AUTO**

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

**CAB PRESS MODE SEL..... MAN**

**MAN V/S CTL..... FULL UP**

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>			
SYSTEM	CONDITIONS	RECOMMENDED ACTION	
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)	
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control	
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control	
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.	
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>	
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)	
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.	
APU	EGT > EGT MAX -33 °C (inhibited during APU start)		
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.	
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"><li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li><li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li></ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.	
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.	
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.  In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended: 1. <u>Low Speed-</u> Increase engine speed to increase fuel flow, and thereby cool IDG oil. 2. <u>High Speed-</u> Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.	
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.	
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.	
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).	



## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION

$$VAPP = VREF + \Delta VREF + APPR COR$$

=

VREF												
Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78	
VREF (KT) = VLS CONF FULL	CG < 25%	108	113	118	123	127	131	136	140	144	148	149
	CG ≥ 25%	106	111	116	121	125	129	134	138	142	146	147

+

$\Delta VREF^{(1)}$

+

APPRoach CORrection		
if $\Delta VREF \leq 10$ kt	if $10 \text{ kt} < \Delta VREF < 20$ kt	if $\Delta VREF \geq 20$ kt
APPR COR is the Highest of		
5 kt * if A/THR ON and / or in case of ice accretion**	1/3 Headwind Max = 15 kt	APPR COR = 1/3 Headwind Max = 10 kt
APPR COR + $\Delta VREF$ limited to 20 kt		APPR COR = 0 kt

\* Multiply the landing distance by an additional factor of 1.1

\*\* In CONF3, add another 5 knot speed increment and multiply the landing distance by an additional factor of 1.2 (instead of 1.1)

=

$$VAPP = VREF + \Delta VREF + APPR COR$$

TO BE INSERTED IN THE MCDU PERF APPR PAGE

(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:


Failure : ALTN LAW  
Flight Conditions : Autothrust ON, ice accretion  
Landing Configuration : CONF 3  
Headwind : 12 kt  
Landing Weight/CG : 48 t/25 %  
VREF determined from the landing weight : 116 kt  
VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt} / 3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136$  kt

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<b>USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES</b>
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## USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors “WITHOUT REV”** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors “WITH REV”** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note: *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

## LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

## LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:


FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
	3	10			1.40×1.90×1.1=3.00
RESULT	3	10			

$VREF = 131\text{ kt.}$  Therefore  $VAPP = 131 + 10 + 5 = 146\text{ kt.}$

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FAILURES	Flaps Lever Position for Landing	$\Delta$ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S $\geq$ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*





*Continued from the previous page*


DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	if there is ice accretion				
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
NAV	IR 1+2+3 FAULT	3	10	1.85	1.85
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.40*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1  3	55 (APPR) 40 (THRESHOLD) 10	2.00*  1.35*	1.90*  1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
-----------------------------------------------------

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*



*Continued from the previous page*


CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
NAV	IR 1+2+3 FAULT	3	10	1.45	1.45
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.35*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>TRIPPED C/B RE-ENGAGEMENT</b>
----------------------------------

In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
----------------	-----------------------------------------------------------------------------------

Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.


The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.



<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>				
ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset	
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B Y 17 on 122VU</li><li>- Wait 1 s before pushing the C/B.</li></ul>	
22	AUTO FLT FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul>	
22	AUTO FLT FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s</li><li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"><li>- RE-ENTER the barometer altimeter setting value, if necessary.</li></ul>	






*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<b>On ground, or in flight:</b> Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT & PURS CAPT sw to the CAPT only position. Wait for 3 s. <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<b>On ground, or in flight:</b> The flight crew must reset all the RMPs one after the other via the RMP control panel: <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"> <li>- Set ELAC 1(2) pb to OFF</li> <li>- Wait 3 s,</li> <li>- Set ELAC 1(2) pb to ON</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>CAUTION</b> Do not reset ELAC, if uncommanded maneuvers occurred during flight.</p> </div> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>WARNING</b> Do not reset more than one computer at a time.</p> </div> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>
	ELAC or SEC malfunction	ELAC or SEC	<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>WARNING</b> Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"> <li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li> <li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li> </ul> </div>
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the 3 C/B: <ul style="list-style-type: none"> <li>• Channel 1 (A13 on 49VU)</li> <li>• Channel 2 (M27 on 121VU)</li> <li>• Channel 1 and 2 (L26 on 121VU)</li> </ul> </li> <li>- Wait 5 s, before pushing the 3 C/B.</li> </ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"> <li>- FWC 1 (F01 on 49VU)</li> <li>- FWC 2.(Q7 on 121VU)</li> </ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"> <li>- FWC 1 (F01 on 49VU)</li> <li>- FWC 2 (Q7 on 121VU)</li> </ul>




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight</p> <p><u>Note:</u>    After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>    After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>    If during taxi, when the aircraft is moving, <u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT ECAM alert appears along with the NW STRG DISC memo, the flight crew may attempt to perform only one BSCU reset. If the mentioned alert and memo disappear after this BSCU reset, continue the flight.</p> <p><u>Note:</u>    After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:             <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:             <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>
46	ATSU Malfunction	ATSU	<p>An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.</p> <b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

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# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
 Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

# CONTAMINATED RUNWAY OPERATIONS

● **TAKEOFF**

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

● **MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING**

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note:     The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

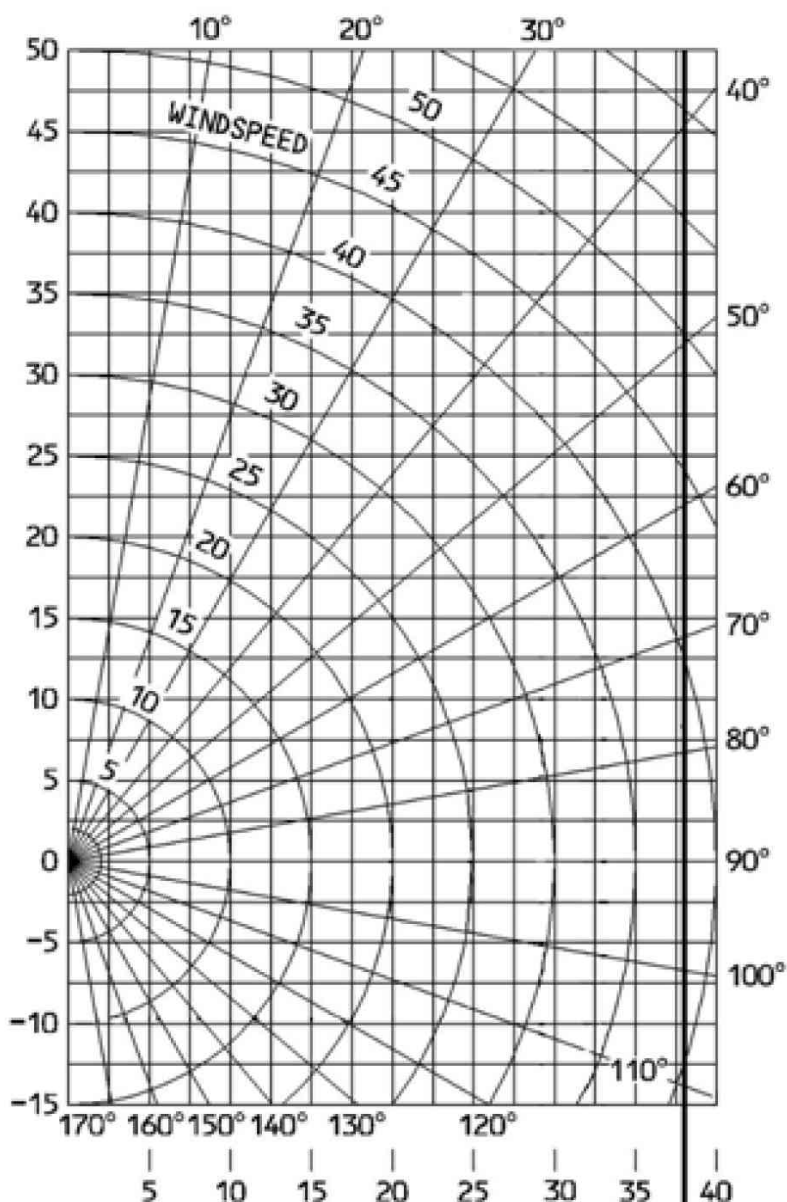
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

CAT II Autoland  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02	
			S ≥ 1	03	NAV	IR 1+2+3 FAULT		01
	1 ≤ FLAPS < 2	S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02		
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	03	
	2 ≤ FLAPS < 3	S < 1	06	BLEED			DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion	
			S ≥ 1		07	ENG	REV UNLOCK with buffet (CONF 1)	
	FLAP = 3	S < 1	08		REV UNLOCK with buffet (CONF 3)		02	
		1 ≤ S ≤ 3	09	SHUTDOWN with ENG FIRE pb pushed and ice accretion			03	
		S > 3	10					
	FLAP > 3	S < 1	11					
		1 ≤ S ≤ 3	12					
		S > 3	13					
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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**IN FLIGHT PERFORMANCE**

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SPEEDS

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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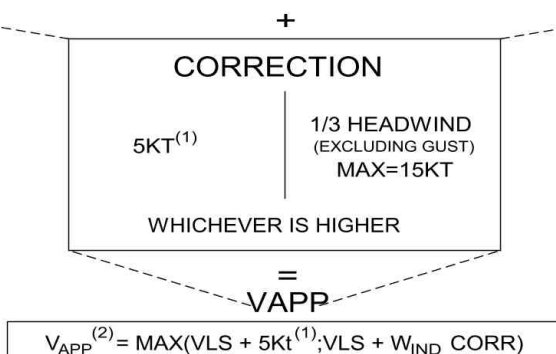


## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

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LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %	+16 %	+24 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+3 %
2 reversers operative	-5 %	-12 %	-15 %	-14 %	-12 %	-27 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note:    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 × 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 × 1.06 × 1.08 = 1 020 m.

**LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL**

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

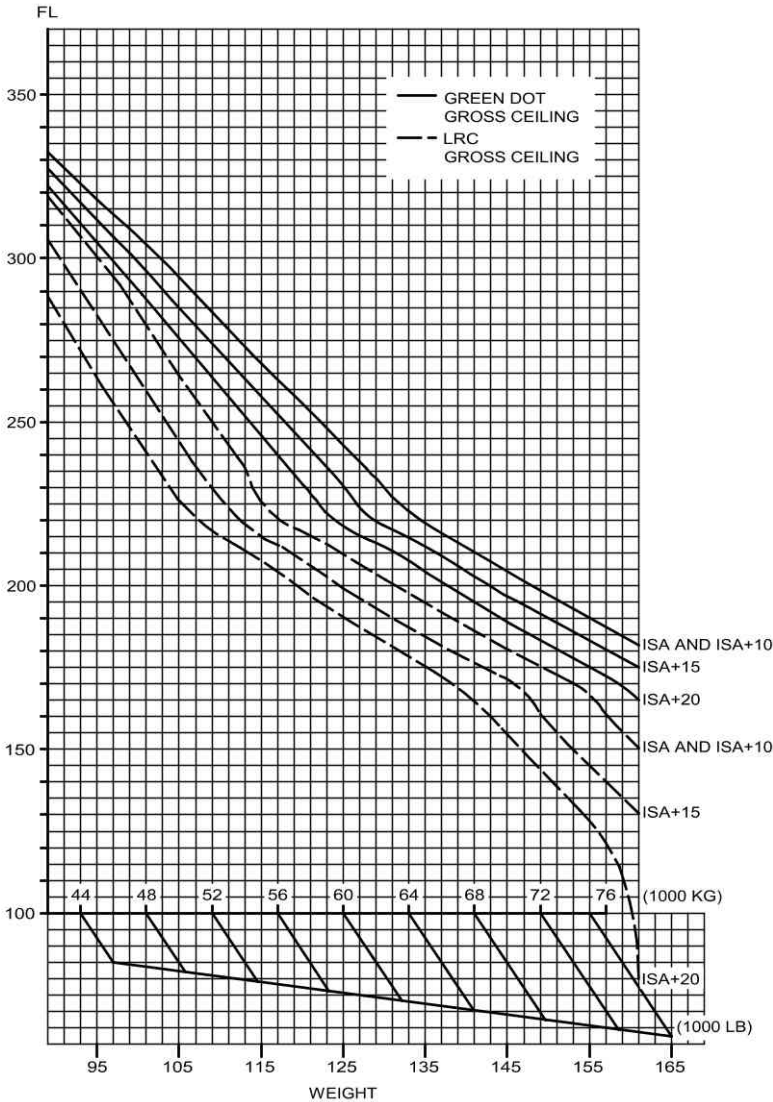
ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

CEILINGS

ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT										
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)		
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)		
ANTI ICE OFF				LEVEL OFF (FT)						
INIT. GW	INITIAL FLIGHT LEVEL									
(1000KG)	250	290	310	330	350	370	390			
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200			
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300			
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200			
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200			
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600			
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100			
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800			
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400			
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100			
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600			
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000				
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400				
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800				
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200				
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600					
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON				
FUEL		+ 14 %				+ 28 %				
TIME		+ 13 %				+ 26 %				
DISTANCE		+ 12 %				+ 23 %				
LEVEL OFF		- 700 ft				- 1800 ft				



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b>
		30 MAR 12

## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)	MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584	
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241	
<b>52</b>	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594	
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246	
<b>54</b>	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602	
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249	
<b>56</b>	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600	
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248	
<b>58</b>	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585	
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242	
<b>60</b>	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562	
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232	
<b>62</b>	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570		
	2434 285	2287 272	2225 266	2248 268	2055 246		
<b>64</b>	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544		
	2454 284	2382 279	2317 272	2272 267	2037 234		
<b>66</b>	1.243 .513	1.322 .556	1.397 .591	1.421 .585			
	2476 284	2432 281	2399 277	2264 263			
<b>68</b>	1.247 .512	1.330 .558	1.412 .599	1.426 .570			
	2499 283	2472 282	2473 280	2253 256			
<b>70</b>	1.254 .514	1.338 .560	1.426 .604	1.436 .543			
	2550 285	2516 283	2537 283	2232 243			
<b>72</b>	1.262 .517	1.351 .567	1.428 .598				
	2604 287	2592 286	2533 280				
<b>74</b>	1.270 .521	1.365 .575	1.432 .587				
	2666 289	2673 290	2523 274				
<b>76</b>	1.290 .539	1.381 .585	1.438 .571				
	2805 299	2767 296	2509 267				
<b>78</b>	1.308 .554	1.395 .593	1.450 .537				
	2927 307	2850 300	2478 250				
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %			

## IN CRUISE QUICK CHECK LONG RANGE

**ONE ENGINE OUT**

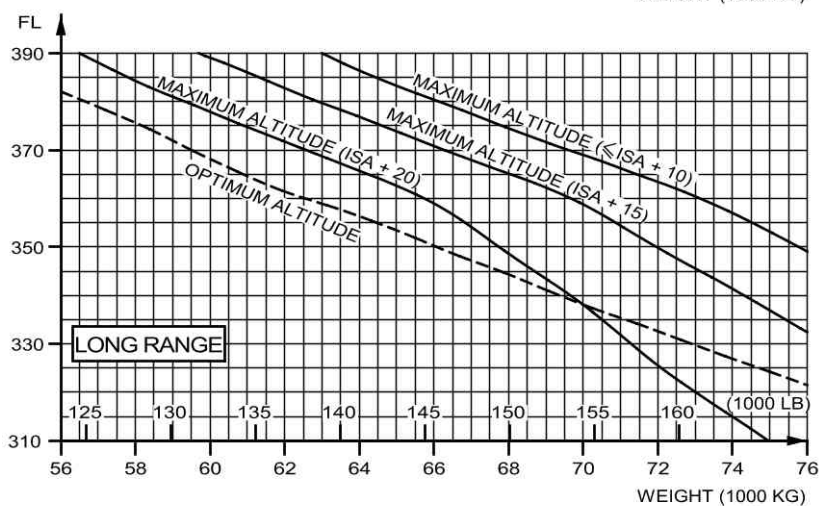
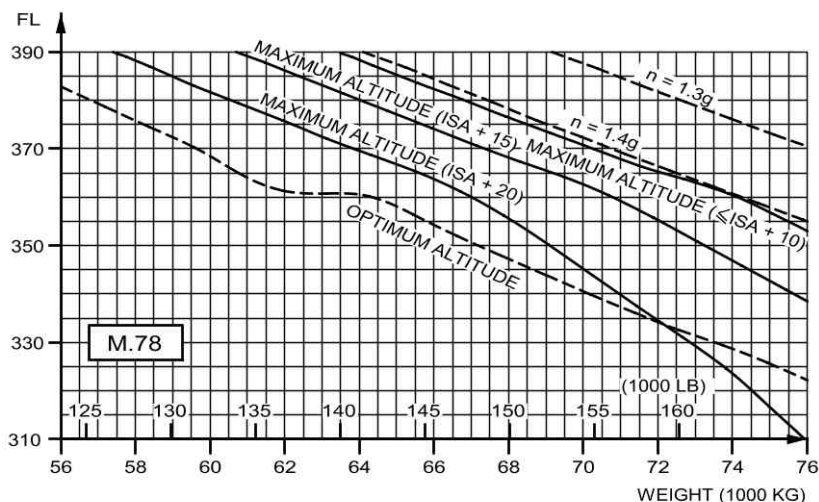
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG PACK FLOW HI ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
						TIME (H.MIN)			
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %					TOTAL ANTI ICE ON △FUEL = + 6 %				





## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

# IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

**ALL ENGINES**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
						TIME (H.MIN)			
AIR	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION		
DIST.							(KG/1000KG)		
(NM)	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING △FUEL = - 0.4 %			ENGINE ANTI ICE ON △FUEL = + 3 %			TOTAL ANTI ICE ON △FUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NQ-04-10-140

# COST INDEX FOR LONG RANGE CRUISE SPEED

**ALL ENGINES**

- For a quick determination of the  $CI_{LRC}$ , use:
- $CI_{LRC}$  = 40 kg/min in the FMGC.
  - or
  - $CI_{LRC}$  = 55 (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									IAS (KT)
	45				65				
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

# QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
△FUEL = - 1 %			△FUEL = + 3 %			△FUEL = + 7 %			

CL-W0-04-13-140





# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

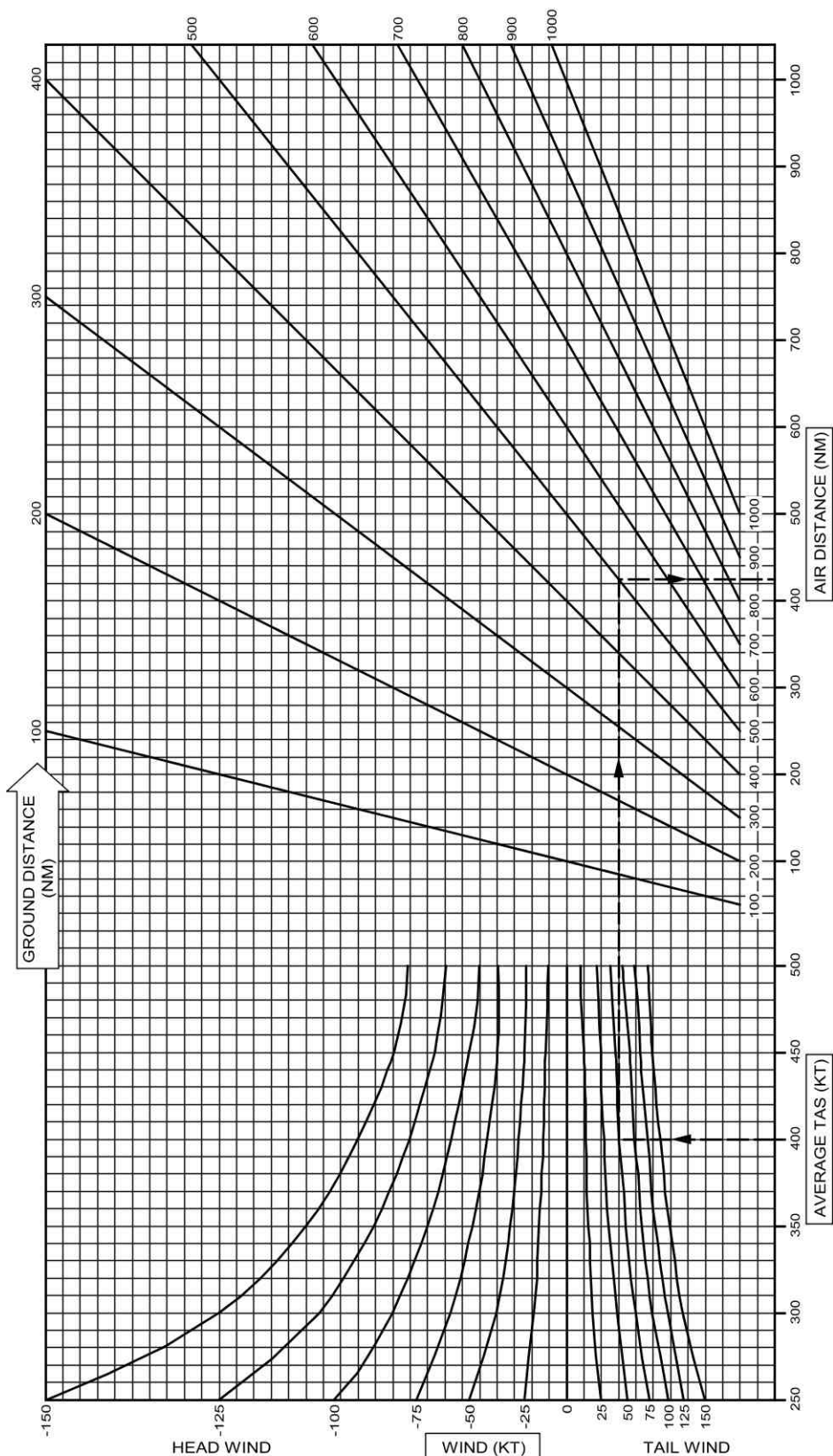
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING ANTI-ICING OFF		ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46
260	1870 1.03	1936 1.00	2004 0.99	2074 0.97	2148 0.95	2222 0.92	2277 0.90
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.98	2396 0.95	2456 0.93
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.99	2634 0.96
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.99
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35
AIR CONDITIONING OFF △FUEL = - 1.5 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 6 %		

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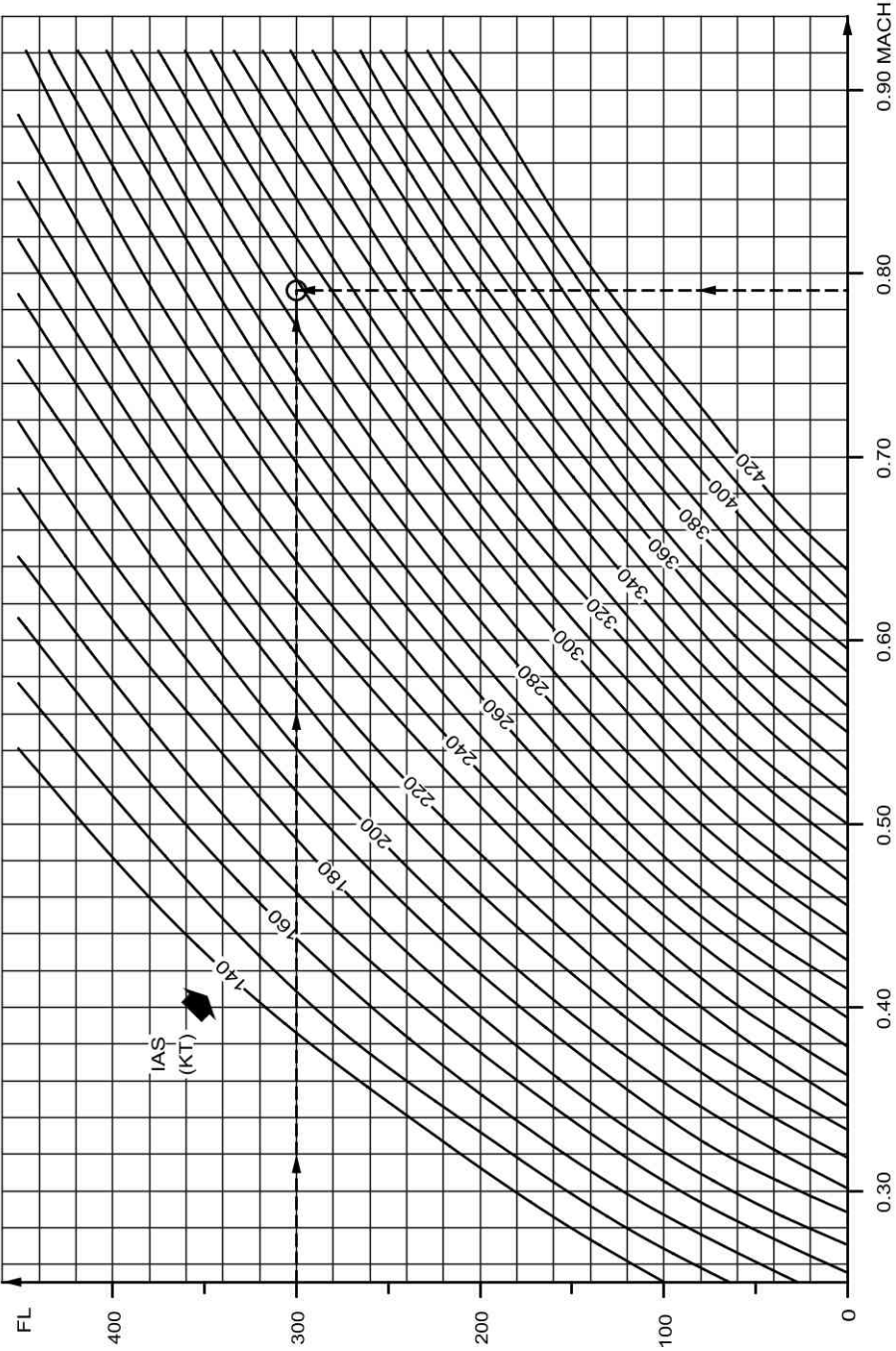
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**







## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEI condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOB at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOB at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

FPF (HYD G SYS LO PR) = 10 %

FPF (INOP SYS: L AIL) = 8 %

Therefore, ADDITIONAL FUEL = (FOB - EFOB at DEST) x (10 % + 8 %)

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore, ADDITIONAL FUEL = (FOB - EFOB at DEST) x 8 %

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
L/G	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT	L/G DOOR	All landing gears doors are extended	15 %
	DOORS NOT CLOSED			

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

## FUEL PENALTY FACTORS/INOP SYS TABLE

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

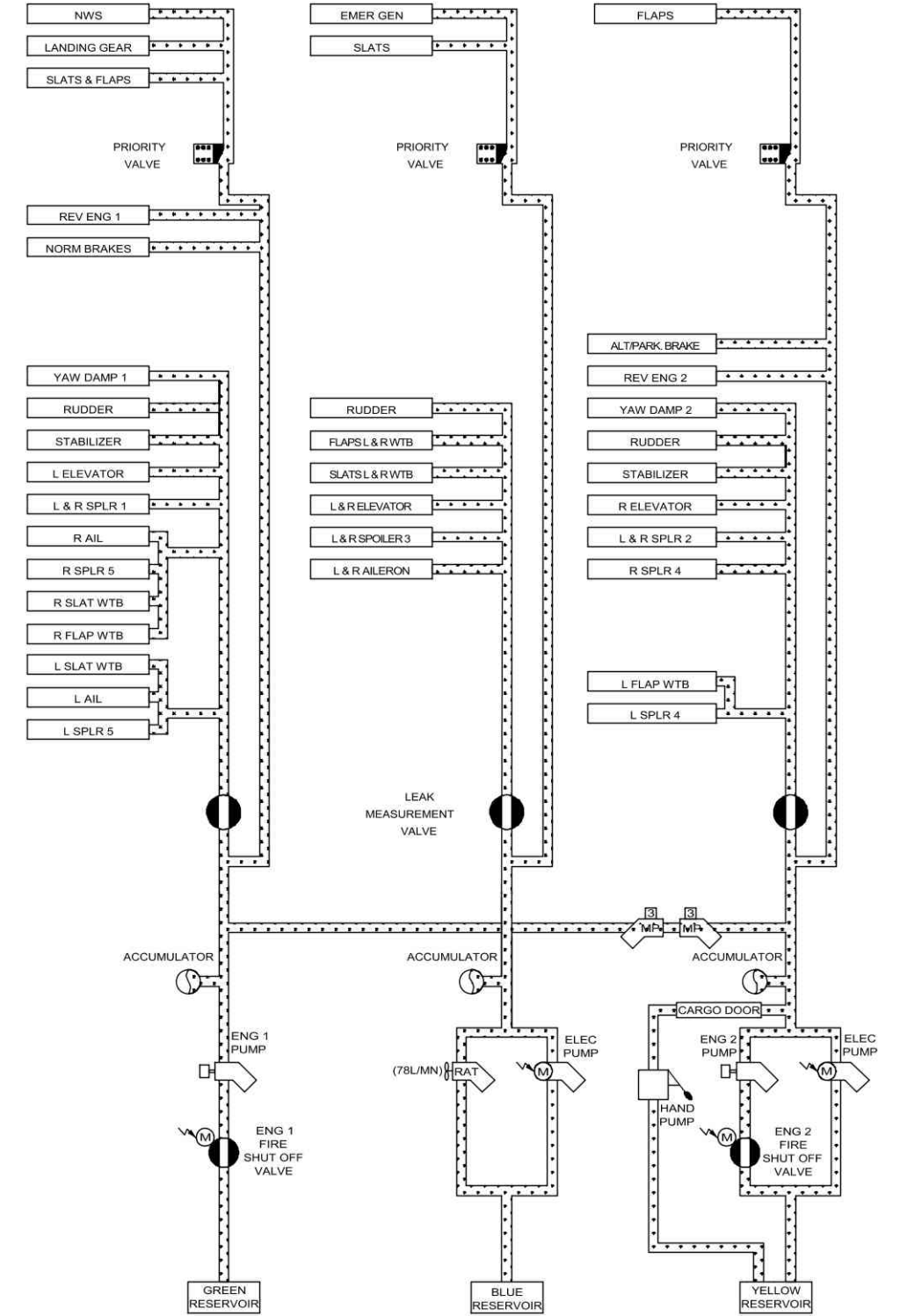
FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

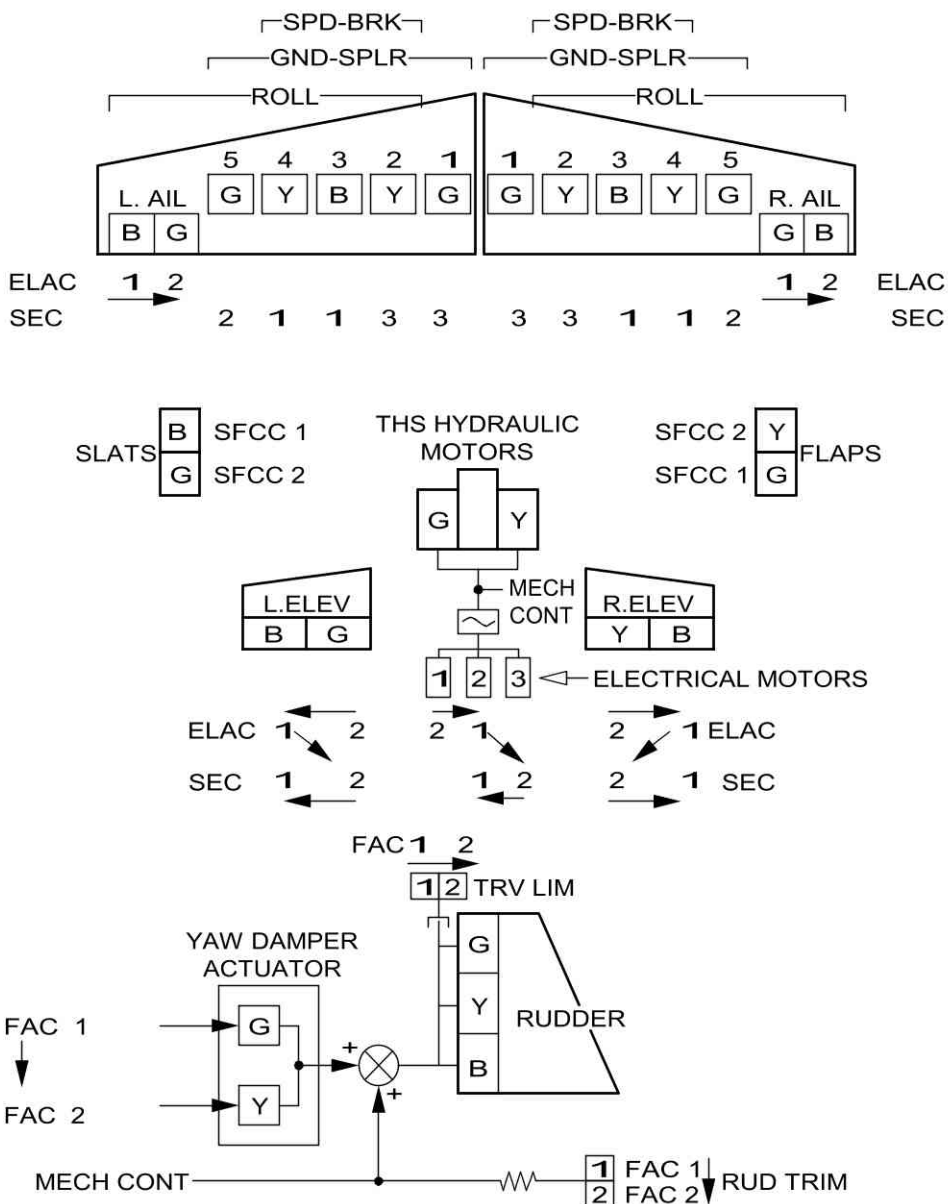
● **FOR APPROACH:**

A/THR in managed speed.....USE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHURST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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## **OEBPROC-PLP PRELIMINARY PAGES**

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## **OEBPROC-11 "ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight**

<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.00</b>
<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.01</b>

## **OEBPROC-17 Dual FM Reset upon Radial Fix Info Entry**

<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.00</b>
<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.01</b>

## **OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.00</b>
<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.01</b>

## **OEBPROC-36 No SRS Engagement During Go Around in the Case of EPR Mode Fault**

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.00</b>
<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.01</b>

## **OEBPROC-38 Erroneous Radio Altimeter Height Indication**

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.00</b>
<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.01</b>

## **OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**

<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.00</b>
<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.01</b>

## **OEBPROC-43 F/CTL SPOILER FAULT**

<b>F/CTL SPOILER FAULT.....</b>	<b>43.00</b>
<b>F/CTL SPOILER FAULT.....</b>	<b>43.01</b>

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

L/G GEAR NOT DOWNLOCKED.....	44.00
■ L/G GEAR NOT DOWNLOCKED ■.....	44.01





## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an ENG 1(2) OIL FILTER CLOG ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSK					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSK					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note:     *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSK				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSK				



## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

*Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).*

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSK				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSK				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>36.00</b> 30 MAR 12
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## OEB36 Issue 1.0

# NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		36.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSK					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSK					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### ECAM ENTRY

ENG 1(2) EPR MODE FAULT

### PROCEDURE

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

Action performed by the PNF on PF request.

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

Rotate to 12.5 ° in case of engine failure.

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSK				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSK				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

 <div>DRAGONAIR</div> <div><b>A320/A321</b></div> <div>QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSK				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSK				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



<b>AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)</b>
--------------------------------------------------------------------------------

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
PACK (affected bleed side).....OFF

X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).





## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSK				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSK				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>44.00</b> 30 MAR 12
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## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSK				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSK				

L/G GEAR NOT DOWNLOCKED

**ECAM ENTRY**

L/G GEAR NOT DOWNLOCKED

**PROCEDURE**

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

L/G GEAR NOT DOWNLOCKED	
<i>This warning appears, if the landing gear sequence is not completed after 30 seconds.</i>	
L/G lever.....	RECYCLE
•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:	
L/G GRAVITY EXTENSION PROC.....	APPLY
STATUS	
The status displayed on the ECAM is correct.	

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSL**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date

No filing instructions


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSL</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HSL</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HSL</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSL</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HSL</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSL</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSL</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSL</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-28	No Localizer or Glide Slope Capture in Approach	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-31	<b>MULTIPLE UNDUE ECAM ALERTS</b>	00013755.0001001	30 MAR 12
	Criteria: 31A1220, 31-1276, P8671, P9824 <b>Applicable to: B-HSL</b> <i>Impacted DU: NONE</i> <u>Reason for issue:</u> <i>This Temporary Revision is issued to give a procedure to the crew in the case of multiple suspected undue ECAM alerts.</i>			

	ABN-80	<b>Computer Reset Table</b>	NG00824	
	ABN-80	<b>Computer Reset Table - 27 - Flight Controls</b>	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSL</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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This table gives, for each delivered aircraft, the cross reference between:

- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	2229	HDA 0003	B-HSL	320-232

(1) Evolution code : N=New, R=Revised


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	27-1189 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L94 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	27-1182 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L93 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			


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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	Applicable to: ALL			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	Applicable to: ALL			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	Applicable to: ALL			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	Applicable to: ALL			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	Applicable to: ALL			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	Applicable to: ALL			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	Applicable to: ALL			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	Applicable to: ALL			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	Applicable to: ALL			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	Applicable to: ALL			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	Applicable to: ALL			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+)- STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	Applicable to: ALL			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	Applicable to: ALL			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	Applicable to: ALL			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	Applicable to: ALL			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	Applicable to: ALL			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	Applicable to: ALL			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	Applicable to: ALL			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	P7062		30 AUG 10	OXYGEN - CREW OXYGEN - INSTALL ALTERNATIVE 115CU FT FLIGHT CREW OXYGEN CYLINDER COMPOSITE SCOTT P/N 897940-15
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			
	K7727		30 AUG 10	EQUIPMENT/FURNISHINGS - MISCELLANEOUS EMERGENCY EQPT - INSTALL AN HONEYWELL ELT WITH CONTROL PANEL IN COCKPIT
	Applicable to: ALL			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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Use of Summaries.....	GEN.02
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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : Index of the back cover page interior                                                                                           |
| C3              | : Index of the back cover page exterior                                                                                           |
| "BLANK"         | : Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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## **ABN-PLP PRELIMINARY PAGES**

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## **ABN-22 Auto Flight**

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<b>LOW ENERGY WARNING.....</b>	<b>22.02</b>

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<b>ELEC EMER CONFIG Summary.....</b>	<b>24.02</b>

## **ABN-25 Equipment**

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## **ABN-26 Fire Protection**

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<b>SIDESTICK/RUDDER PEDALS STIFF.....</b>	<b>27.03</b>
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CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● If  $\Delta P > 9$  PSI

PACK 1+2.....OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.
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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The “CAB PR LDG ELEV FAULT” message is displayed on the ECAM
- A “MAP NOT AVAIL” message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.


Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		



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<b>ELEC EMER CONFIG SYS REMAINING</b>
---------------------------------------

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



*Continued from the previous page*

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	ISIS	Norm	Norm	Norm
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a) Restored, when speed is below 100 kt.

(b) Crew oxygen valve inoperative.


(c) Lost, when speed is below 50 kt.

(d) Lost 30 s after last engine shutdown.

(e) IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f) For APU start only.

(g) Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
---------------------------------

CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
<b>DRY Runway</b>	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
 In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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SMOKE/FUMES REMOVAL

EMER EXIT LIGHT..... ON

● **If fuel vapors:**

CAB FANS..... ON

PACK 1+2..... OFF

● **If no fuel vapors:**

CAB FANS..... OFF

PACK FLOW..... HI

LDG ELEV..... 10 000 FT/MEA

DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

ATC..... NOTIFY

SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE

*While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*

● **At FL 100 OR MEA:**

APU MASTER SW (if in ELEC EMER CONFIG)... ON

PACK 1+2..... OFF

MODE SEL..... MAN

MAN V/S CTL..... FULL UP

RAM AIR..... ON

APU MASTER SW..... OFF

● **If smoke persists, open CKPT window:**

MAX SPEED..... 200 KT

COCKPIT DOOR..... OPEN

HEADSETS..... ON

PNF COCKPIT WINDOW..... OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE



**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMERG
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT.....ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATE:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL.....CONSIDER  
 ELEC EMER CONFIG.....CONSIDER  
*Refer to the end of the procedure to Set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING.....CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

**● IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
BLOWER..... AUTO  
EXTRACT..... AUTO  
PACK 1..... OFF

**● If smoke continues:**

PACK 1..... ON  
PACK 2..... OFF

**● If smoke still continues:**

PACK 2..... ON  
BLOWER..... OVRD  
EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

**● IF CAB EQUIPMENT SMOKE SUSPECTED:**

**● If smoke continues:**

EMER EXIT LIGHT..... ON  
COMMERCIAL..... OFF  
SMOKE DISSIPATION..... CHECK  
FAULTY EQPT..... SEARCH/ISOLATE

**● If smoke still continues or if faulty  
equipment confirmed isolated:**

COMMERCIAL..... NORM

SMOKE/FUMES REMOVAL..... CONSIDER





## **SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

### **UNDETERMINED/AVNCS/ELECTRICAL SMOKE**

- **IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:**  
ELEC EMER CONFIG..... CONSIDER
- **IF SMOKE DISAPPEARS WITHIN 5 MINUTES:**  
NORMAL VENTILATION..... RESTORE

### **TO SET ELEC EMER CONFIG**

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

- **WHEN EMER GEN AVAIL:**

APU GEN.....OFF  
GEN 2..... OFF

### **ELEC EMER CONFIG**

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- **AT 3 min OR 2 000 ft AAL BEFORE LANDING:**

GEN 2.....ON  
EMER ELEC GEN 1 LINE.....ON

- **WHEN A/C IS STOPPED:**

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


- Note:
- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
  - In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED


Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1						177 kt
S = 1						
1 < S ≤ 3	200 kt		200 kt	185 kt	177 kt	
S > 3	177 kt		177 kt	177 kt		

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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<b>SIDESTICK/RUDDER PEDALS STIFF</b>		
<p>Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:</p> <ul style="list-style-type: none"><li>- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or</li><li>- One sidestick and the rudder pedals at the same time.</li></ul> <p>The piloting technique remains the same: The aircraft remains responsive. However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.</p> <p>AP DISENGAGEMENT.....CONFIRM</p> <p>CONSIDER TRANSFERRING CONTROL TO PNF</p> <p>● <b>FOR DECRAB, ROLLOUT, OR ENGINE FAILURE</b></p> <p>BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL</p>		





## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

● **IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

● **IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3  
*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP

**FUEL IMBALANCE**

FOB..... CHECK  
 Compare the FOB + FU, with the FOB at departure.  
 If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. Refer to ABN-28 FUEL LEAK.
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FUEL X FEED..... ON  
 ● On the lighter side and in the center tank:  
   FUEL PUMPS.....OFF  
 ● When fuel is balanced:  
   FUEL PUMPS (WING + CTR)..... ON  
   FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.


FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



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**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*
- **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**  
 CTR TK PUMP 1+2..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147


APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	<i>Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75</i>								
<b>CONTA runway (CONF 3)</b>	<i>Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90</i>								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	

GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	


ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).



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### HYD G + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS SLOW / FLAPS JAMMED	
GPWS FLAP MODE.....	OFF
● For Flaps extension:	
SPD SEL.....	VFE NEXT - 5KT
When in landing CONF : DECELERATE TO CALCULATED VAPP	
Stabilize at VAPP before L/G down, to be trimmed for approach.	
L/G GRAVITY EXTENSION	

LANDING											
<b>FLARE:</b> PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law											
<b>SPOILERS:</b> Only 1 per wing											
<b>NO REVERSER</b>											
<b>BRAKING:</b> BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI											
<b>NO NOSEWHEEL STEERING</b>											


GO-AROUND											
NO GEAR RETRACTION. Increased fuel consumption											
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt											
<b>● For diversion:</b> <b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds <b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt											

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10								
CORRECTIONS	+ 1 000 ft above SL					+ 10 kt tailwind			
DRY runway	+ 3 %					+ 18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or INVALID DATA message),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, ECAM DUs or MCDU 1 is(are) affected.

GEN 1 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 1 ..... ON

#### ■ If DUs stop flashing:

GEN 1 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 2 ..... ON

#### ■ If DUs stop flashing:

GEN 2 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ DU is blank (with or without a large letter “F” in amber), or the display is distorted:

DU (affected) ..... AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected) ..... USE

*Transfer SD to the F/O or CAPT ND.*


PFD/ND XFR (if the EFIS DUs are affected) ..... USE

### ■ INVALID DISPLAY UNIT message is displayed:

This may be caused by a DU failure.

FOR AUTOMATIC DU RECOVERY ..... WAIT MORE THAN 40 s



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<b>DISPLAY UNIT FAILURE (Cont'd)</b>		
<ul style="list-style-type: none"> <li>● <b>IF DU IS AUTOMATICALLY RECOVERED:</b> No crew action is required.</li> <li>● <b>IF DU IS NOT RECOVERED:</b> Non-recovered DU..... AS RQRD <i>The DU can be switched off.</i></li> <li>■ <b>INVALID DATA message appears (not on all DUs):</b> EIS DMC SWITCHING..... AS RQRD</li> <li>● <b>If unsuccessful:</b> DU (affected)..... OFF THEN ON  <i><u>Note:</u> The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.</i></li> <li>■ <b>INVALID DATA message appears on all DUs:</b> The autopilot, autothrust and MCDU navigation data are still available, and may be used. FOR AUTOMATIC DUs RECOVERY ..... WAIT MORE THAN 40 s</li> <li>● <b>IF ALL DUs ARE AUTOMATICALLY RECOVERED:</b> No crew action is required.</li> <li>● <b>IF ONE OR MORE DUs ARE NOT RECOVERED:</b> Non-recovered DUs..... OFF FOR 40 s Non-recovered DUs..... BACK ON sequentially           <ul style="list-style-type: none"> <li>● <b>If the initial failure re-occurs (INVALID DATA message appears on all DUs), when switching a given DU back ON:</b> Apply the entire procedure again, from the beginning. Leave this specific DU permanently OFF.</li> </ul> </li> <li>■ <b>INVERSION OF THE EWD AND THE SD:</b> ECAM UPPER DISPLAY ..... OFF THEN ON <i>The same action on the EIS DMC SWITCHING selector produces the same effect.</i></li> </ul>		



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

MULTIPLE UNDUE ECAM ALERTS

- In the case of multiple undue ECAM alerts concerning :
- ENG 1(2) N1(N2) (EGT) (FF) OVER LIMIT or
  - ENG 1(2) N1(N2) (EGT) (EPR) (FF) DISCREPANCY or,
  - NAV ATT(ALT) (HDG) DISCREPANCY or,
  - NAV FM/GPS POS DISAGREE or,
  - FUEL F.USED/FOB DISAGREE or,
  - MINIMUM or HUNDRED ABOVE callouts,

possibly associated with EFIS red flags, apply the below procedure :

AFFECTED PARAMETERS..... CROSSCHECK

*Crosscheck the affected parameters on the E/WD, PFD, ND or on the related SD page to confirm that the alerts are spurious.*

- **If it is confirmed that the ECAM alerts are spurious, identify the faulty DMC :**  
EIS DMC SWITCH.....CAPT 3  
*DMC 3 replaces DMC 1. If the undue alerts stop, DMC 1 is the faulty DMC.*
- **If unsuccessful :**  
EIS DMC SWITCH.....F/O 3  
*DMC 3 replaces DMC 2. If the undue alerts stop, DMC 2 is the faulty DMC.*



LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <u>WHEEL</u> SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOME LT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.



LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE


- **If NOSE L/G abnormal:**  
 NOSE..... MAINTAIN UP  
*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*  
 BRAKES (compatible with elevator efficiency)..... APPLY  
 ENG MASTERS..... OFF  
*Shutdown the engines before nose impact.*

- **If one MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*At touchdown, shut down both engines.*  
 FAILURE SIDE WING..... MAINTAIN UP  
*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*  
 DIRECTIONAL CONTROL..... MAINTAIN  
*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

- **If both MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*Shut down the engines in the flare, before touchdown.*  
 PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

**WHEN A/C STOPPED**

ENG (all) and APU FIRE pushbutton..... PUSH  
*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*  
 ENG (all) and APU AGENT..... DISCH

- **If Evacuation required:**  
 EVACUATION..... INITIATE  
 - All emergency and passenger doors may be used to evacuate the aircraft.  
 - Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

- **If Evacuation not required:**  
 CABIN CREW and PASSENGERS (PA)..... NOTIFY  
*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

#### **F/CTL ALTN LAW**

#### **(PROT LOST)**

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

#### **APPR PROC:**

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### ● **FOR L/G GRVTY EXTN (not on the ECAM):**

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### **INOP SYS**

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### **Other INOP SYS**

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT



ADR 1 + 2 + 3 FAULT (Cont'd)


- DURING FINAL APPR  
V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*



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## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.

- **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.

- **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
- **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
- **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

■ **MCDU INITIALIZATION:**

- DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*
- IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*
- A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*

■ **CDU INITIALIZATION:**

- Depending on the CDU keyboard installed, an “H” may be written on the “5” key:
- **If “H” is written on the “5” key:**
- H KEY.....PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*
- A/C HEADING..... ENTER
- **If “H” is not written on the “5” key:**
- A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG–ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s).....OFF  
 REMAINING AIR DATA.....CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR.....KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs.....OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF.....USE FLAP 3

APP SPD.....VLS +10

LDG DIST PROC.....APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST.....CLB

FLAPS.....RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

### ■ Other cases:

Refer to *ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	250 kt	10.0/CLB	10.5/CLB	11.5/CLB
FL 50 - FL 100		9.0/CLB	9.5/CLB	10.0/CLB
FL 100 - FL 150		8.0/CLB	8.5/CLB	8.5/CLB
FL 150 - FL 200		7.0/CLB	7.0/CLB	7.0/CLB
FL 200 - FL 250	275 kt	5.0/CLB	5.0/CLB	5.0/CLB
FL 250 - FL 320		4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.

When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200-FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320-FL 200	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE
FL 200 - FL 100	250 kt	1.5/IDLE	0.5/IDLE	-0.5/IDLE
Below FL 100	250 kt	1.0/IDLE	0.0/IDLE	-1.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.5/IDLE	2.5/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 67 t	67 t - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.5/55.7	5.5/51.5	6.0/47.3
1	S	7.5/58.2	7.5/54.0	7.5/49.0
1+F <sup>(1)</sup>	S	4.5/60.2	4.5/56.1	4.5/51.2
2	F	9.0/61.7	9.0/57.3	9.0/52.8





<b>UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)</b>
----------------------------------------------------------------

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	7.5/67.2	7.5/62.7	7.5/57.9

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

<b>FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH</b>
-------------------------------------------------------------

LANDING GEAR DOWN				
		Above 67 t	67 t - 55 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	4.5/48.0	4.5/44.4	4.5/41.4

**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

##### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

##### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



AIR DUAL BLEED FAULT (Cont'd)

- If engine bleed recovery was not successful, or if one pack is inoperative :  
 X BLEED..... CHECK OPEN  
 DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
 APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
 WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
 APU BLEED..... ON  
 MAX FL200  
 AVOID ICING CONDITIONS
  - IF ICE ACCRETION  
 APPR SPD.....VLS + 10 KT  
 LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**

CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**

APU (IF AVAIL).....START

● **WHEN BELOW FL 200**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*

#### ■ **If Evacuation required:**

EVACUATION..... INITIATE

ELT  ..... CHECK EMITTING

*If not, switch on the transmitter.*

#### ■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*





## ENG DUAL FAILURE - NO FUEL REMAINING

The flight crew should apply this paper procedure and then, if time permits, clear ECAM warnings and check the ECAM STATUS page.

THRUST LEVERS..... IDLE

FAC 1.....OFF THEN ON

*Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.*

OPTIMUM SPEED.....220 KT/GREEN DOT

*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

EMER ELEC POWER (if EMER GEN not in line).....MAN ON

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

CREW OXY MASKS (Above FL 100).....ON

CABIN AND COCKPIT.....PREPARE

SIGNS.....ON

COMMERCIAL.....OFF

USE RUDDER WITH CARE

### ● WHEN BELOW FL 150

RAM AIR..... ON

## COMMON ACTIONS FOR THE APPROACH

### APPROACH PREPARATION

Note: *Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).*

BARO..... SET

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

## IF FORCED LANDING ANTICIPATED

### APPROACH

FOR LDG.....USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**


ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

  - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF


AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

# ENG RELIGHT (IN FLIGHT)

- MAX ALTITUDE.....See below
- ENG MASTER (affected).....OFF
- THR LEVER (affected)..... IDLE
- ENG MODE SEL..... IGN
- X BLEED ..... OPEN
- WING A. ICE (for starter assist).....OFF
- ENG MASTER (affected)..... ON

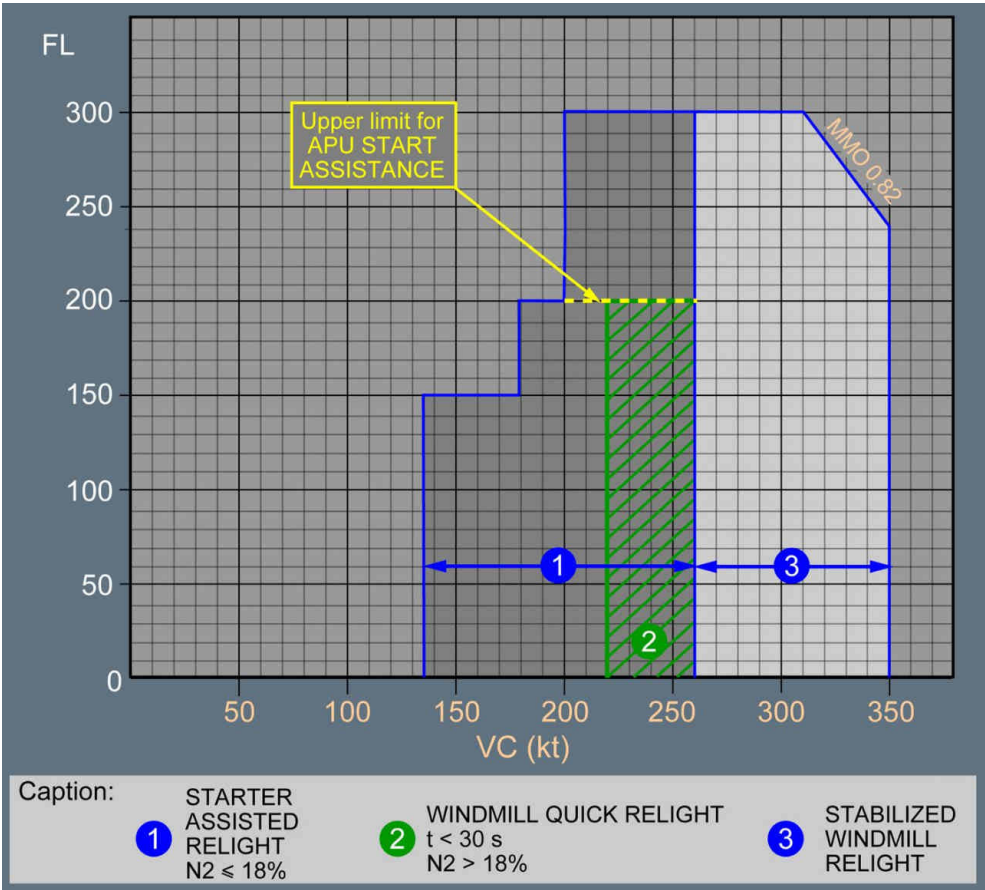
Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.  
 Engine light up should be achieved within 30 s after fuel flow increases.

■ **When idle is reached:**

- ENG MODE SEL..... NORM
- TCAS MODE SEL  ..... check TA/RA
- Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.
- Affected SYS..... RESTORE

■ **If no relight:**

- ENG MASTER (affected)..... OFF
- Wait 30 s before attempting a new start (to drain the engine).





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
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MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

- When burning has stopped :  
MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1  $\geq$  5 units, N2  $\geq$  5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

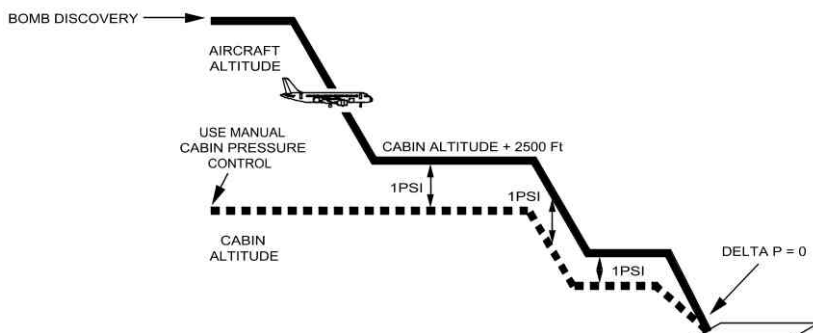
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE
<i>Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.</i>	
NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN
<i>Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.</i>	
DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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<b>BOMB ON BOARD (Cont'd)</b>	
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**PORTABLE ELECTRONIC DEVICES..... SWITCH OFF**  
*The cabin crews must command passengers to switch off all portable electronic devices.*

**BOMB.....CHECK NO ANTI-LIFT DEVICE**  
*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*  
*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*  
*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*  
*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

**EMERGENCY EQUIPMENTS.....REMOVE AND STOW**  
*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

**GALLEY/IFE POWER.....OFF**  
*All galley and IFE equipments located close to the LRBL must be switched off.*

● **If the bomb can be moved:**

**RH AFT CABIN DOOR SLIDE..... DISARM**  
**LEAST RISK BOMB LOCATION (LRBL)..... PREPARE**  
*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*  
*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*  
*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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**BOMB INDICATION LINE..... POSITION**  
*Note: A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*  
*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

**BOMB..... MOVE TO LRBL**  
*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

<b>CAUTION</b>	<i>Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.</i>
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## BOMB ON BOARD (Cont'd)

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

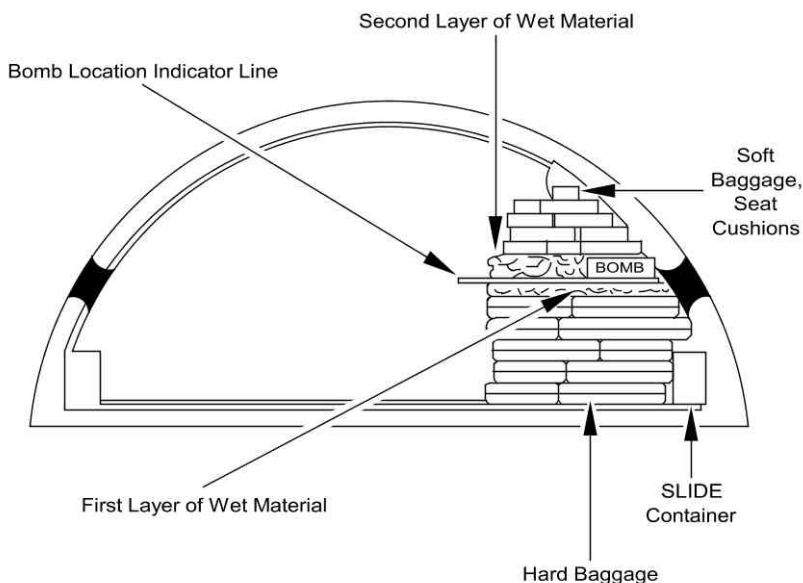
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



PASSENGERS.....MOVE/ADVISE


*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
<i>Evacuate through normal and emergency exits on the opposite side of the “bomb” location. Do not use the door just opposite the “bomb”.</i>		
<i>Use all available airport facilities to disembark without delay.</i>		



## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT.....ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY

FIRE pushbutton (ENG and APU).....PUSH


AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE





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FORCED LANDING (Cont'd)

ELT..... CHECK EMITTING

*If not, switch on the transmitter.*

■ If Evacuation not required:

CABIN CREW and PASSENGERS (PA)..... NOTIFY

## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


### WHEN DESCENT ESTABLISHED

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

**CAUTION**    *Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note:    *The recommendation is to descend with the autopilot engaged.  
 Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN  
 ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note:    *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
- If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.

In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.

Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown

REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								

# STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**  
*This will reduce angle of attack*

*Note: In case of lack of pitch down authority, reducing thrust may be necessary.*

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

*Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

**SPEEDBRAKES..... CHECK RETRACTED**  
**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

*Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

# STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**  
**BANK..... WINGS LEVEL**

*Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.*

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.  
Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- If the aircraft enters a volcanic ash cloud:
 

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
PACK FLOW.....	HI

Note:     If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

If airspeed is unreliable or lost,Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

Note:     If all engines flame out and speed indications are lost,Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note:     If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

Due to the increased noise level, pay particular attention to visual warnings.



## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note:    - *When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.*  
               - *In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.*

WINDSHEAR

A red flag “WINDSHEAR” is displayed on each PFD associated with an aural synthetic voice “WINDSHEAR” repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

■ **At takeoff**

■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

■ **If after V1**

THR LEVERS.....TOGA  
 REACHING VR.....ROTATE  
 SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*

Note:    1. *If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.*  
               2. *If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.*







## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*

Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

**WINDSHIELD/WINDOW ARCING**

Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)



## WINDSHIELD/WINDOW CRACKED

DIAGNOSIS OF INNER PLY.....PERFORM

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL..... 230/MEA

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

CAB PRESS MODE SEL..... MAN

MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


CAB PRESS MODE SEL..... AUTO

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

CAB PRESS MODE SEL..... MAN

MAN V/S CTL..... FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>
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SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
OXY	Cockpit oxygen bottle pressure < 600 PSI.	If mask is not being used, check if it is correctly stowed.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).



## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION

$$VAPP = VREF + \Delta VREF + APPR COR$$

=

VREF												
Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78	
VREF (KT) = VLS CONF FULL	CG < 25%	108	113	118	123	127	131	136	140	144	148	149
	CG ≥ 25%	106	111	116	121	125	129	134	138	142	146	147

+

$\Delta VREF^{(1)}$

+

APPRoach CORrection		
if $\Delta VREF \leq 10$ kt	if $10 \text{ kt} < \Delta VREF < 20$ kt	if $\Delta VREF \geq 20$ kt
APPR COR is the Highest of		
5 kt * if A/THR ON and / or in case of ice accretion**	1/3 Headwind Max = 15 kt	APPR COR = 1/3 Headwind Max = 10 kt
APPR COR + $\Delta VREF$ limited to 20 kt		APPR COR = 0 kt

\* Multiply the landing distance by an additional factor of 1.1

\*\* In CONF3, add another 5 knot speed increment and multiply the landing distance by an additional factor of 1.2 (instead of 1.1)

=

$$VAPP = VREF + \Delta VREF + APPR COR$$

TO BE INSERTED IN THE MCDU PERF APPR PAGE

(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:


Failure : ALTN LAW  
Flight Conditions : Autothrust ON, ice accretion  
Landing Configuration : CONF 3  
Headwind : 12 kt  
Landing Weight/CG : 48 t/25 %  
VREF determined from the landing weight : 116 kt  
VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt}/3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136$  kt

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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors "WITHOUT REV"** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors "WITH REV"** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note: *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column ("WITH REV." or "WITHOUT REV.")
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:


FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
	3	10			1.40×1.90×1.1=3.00
RESULT	3	10			

$VREF = 131\text{ kt.}$  Therefore  $VAPP = 131 + 10 + 5 = 146\text{ kt.}$

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FAILURES	Flaps Lever Position for Landing	$\Delta$ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S $\geq$ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt

 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>80.16</b>
		30 MAR 12

<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*





*Continued from the previous page*


DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	if there is ice accretion				
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<div style="text-align: center; font-size: 24pt; font-weight: bold;">80.17</div> <div style="text-align: center;">30 MAR 12</div>
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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
NAV	IR 1+2+3 FAULT	3	10	1.85	1.85
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.40*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1  3	55 (APPR) 40 (THRESHOLD) 10	2.00*  1.35*	1.90*  1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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		30 MAR 12

<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*



*Continued from the previous page*


CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
NAV	IR 1+2+3 FAULT	3	10	1.45	1.45
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.35*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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		30 MAR 12

<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<div style="text-align: center; font-size: 24pt; font-weight: bold;">80.20</div> <div style="text-align: center;">30 MAR 12</div>
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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.


The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.



<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK		<b>ABNORMAL AND EMERGENCY PROCEDURES</b>		<b>80.21</b>  30 MAR 12
<b>COMPUTER RESET TABLE</b>				
ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset	
21	<u>VENT</u> AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B Y 17 on 122VU</li><li>- Wait 1 s before pushing the C/B.</li></ul>	
22	<u>AUTO FLT</u> FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul>	
22	<u>AUTO FLT</u> FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s</li><li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"><li>- RE-ENTER the barometer altimeter setting value, if necessary.</li></ul>	






*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<b>On ground, or in flight:</b> Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT & PURS CAPT sw to the CAPT only position. Wait for 3 s. <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<b>On ground, or in flight:</b> The flight crew must reset all the RMPs one after the other via the RMP control panel: <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<div>On ground, or in flight</div> <div><div>- Set ELAC 1(2) pb to OFF</div><div>- Wait 3 s,</div><div>- Set ELAC 1(2) pb to ON</div></div> <div><div>CAUTION</div><div>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</div></div> <div>Note: If both ELACs are failed, reset one ELAC after the other.</div>
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<div><div>WARNING</div><div>Do not reset more than one computer at a time.</div></div> <div>Note: If a reset is performed, the flight crew must then perform a flight controls check.</div>
	ELAC or SEC malfunction	ELAC or SEC	<div><div>WARNING</div><div><div>Do not reset more than one computer at a time.</div><div><div>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</div></div></div><div><div>Note:</div><div><div>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</div><div>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</div></div></div></div>
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<div>On ground, or in flight:</div> <div><div>- Pull the 3 C/B:</div><div><div>• Channel 1 (A13 on 49VU)</div><div>• Channel 2 (M27 on 121VU)</div><div>• Channel 1 and 2 (L26 on 121VU)</div></div><div>- Wait 5 s, before pushing the 3 C/B.</div></div> <div>Note: The fuel quantity indication will be re-established within 1 min.</div> <div><div>CAUTION</div><div><div>The FUEL AUTO FEED FAULT caution will be lost for the remainder of the flight.</div><div>In flight:</div><div><div>- If center tank is not empty, while one inner tank contains less than 5 000 kg (11 000 lb) of fuel:</div><div><div>• FUEL MODE SEL (MAN)</div></div><div>- When center tank is empty:</div><div><div>• CTR TK PUMP 1 and 2 (OFF)</div><div>• FUEL MODE SEL (MAN)</div></div></div></div></div>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>






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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><b>Note:</b> After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><b>Note:</b> After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><b>Note:</b> After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1: <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2: <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<b><u>On ground only:</u></b> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
	ISIS malfunction	ISIS	<b><u>On ground only:</u></b> With aircraft not moving: <ul style="list-style-type: none"> <li>- Pull C/B F12 on 49VU,</li> <li>- Wait 5 s, then push the C/B,</li> <li>- Normal operation is expected after approximately 2 min.</li> </ul> <p><i>Note:</i>    <i>In the case of small aircraft motion during the C/B reset (refueling, cargo loading conditions, etc.), the ATT red flag may appear on the ISIS. In this case, press the RST P/B for 2 s, and wait 2 min to recover normal operation.</i></p>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<b><u>On ground, or in flight:</u></b> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus. <p><b><u>On ground, or in flight:</u></b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
 Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

● **TAKEOFF**

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

● **MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING**

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

- Damp or wet runway (less than 3 mm water depth)
- Runway covered with slush
- Runway covered with dry snow
- Runway covered with standing water with risk of hydroplaning or wet snow
- Ice runway or high risk of hydroplaning

Note:     The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

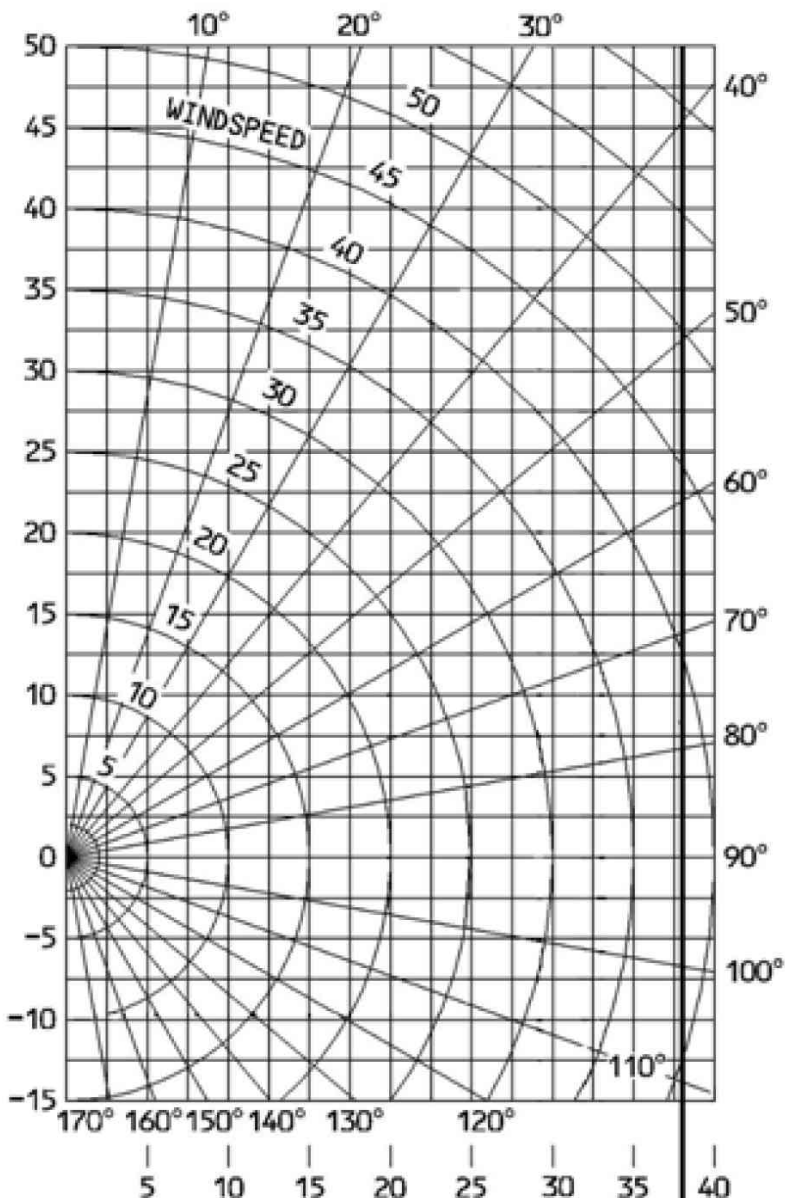
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320

SYS	FAILURE		CODE	SYS	FAILURE		CODE
ELEC	AC BUS 1		01	HYD	GREEN		01
	DC BUS 2		02		BLUE		02
	DC ESS BUS if there is no ice accretion		03		YELLOW		03
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05
	DC EMER CONFIG		06		BLUE + YELLOW		06
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01
	EMER ELEC CONFIG		08				
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02
			S ≥ 1	03	NAV	IR 1+2+3 FAULT	
	1 ≤ FLAPS < 2	S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02	
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	03
	2 ≤ FLAPS < 3	S < 1	06	BLEED			DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion
			S ≥ 1		07		
	FLAP = 3	S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)	
		1 ≤ S ≤ 3	09	REV UNLOCK with buffet (CONF 3)		02	
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03	
	FLAP > 3	S < 1	11				
		1 ≤ S ≤ 3	12				
		S > 3	13				
F/CTL	ONE SPLR FAULT		01				
	TWO SPLR FAULT		02				
	THREE SPLR FAULT		03				
	ALL SPLR FAULT/GND SPLR FAULT		04				
	SEC 1 or SEC 3 FAULT		05				
	SEC 2 FAULT		06				
	SEC 2 + 3 FAULT		07				
	SEC 1 + 3 FAULT		08				
	SEC 1 + 2 FAULT		09				
	RUDDER JAM		10				
	SEC 1 + 2 + 3 FAULT		11				
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12				

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**IN FLIGHT PERFORMANCE**

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SPEEDS

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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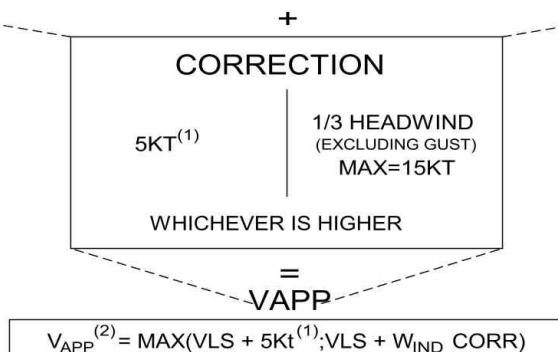


## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

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LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600
CORRECTION ON ACTUAL LANDING DISTANCE											
RUNWAY CONDITION	dry runway	wet runway	runway covered with								
			standing water	slush		compacted snow	ice				
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %		+4 %		+5 %			
per 10 kt headwind	No correction for headwind due to wind correction on approach speed										
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %		+16 %		+24 %			
forward C.G.	+2 %	+3 %	+3 %	+3 %		+3 %		+3 %			
2 reversers operative	-5 %	-12 %	-15 %	-14 %		-12 %		-27 %			
Per 5 kt speed increment (and no failure) add 8 % (all runways)											

Note:    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 x 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 x 1.06 x 1.08 = 1 020 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:*    - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF FULL

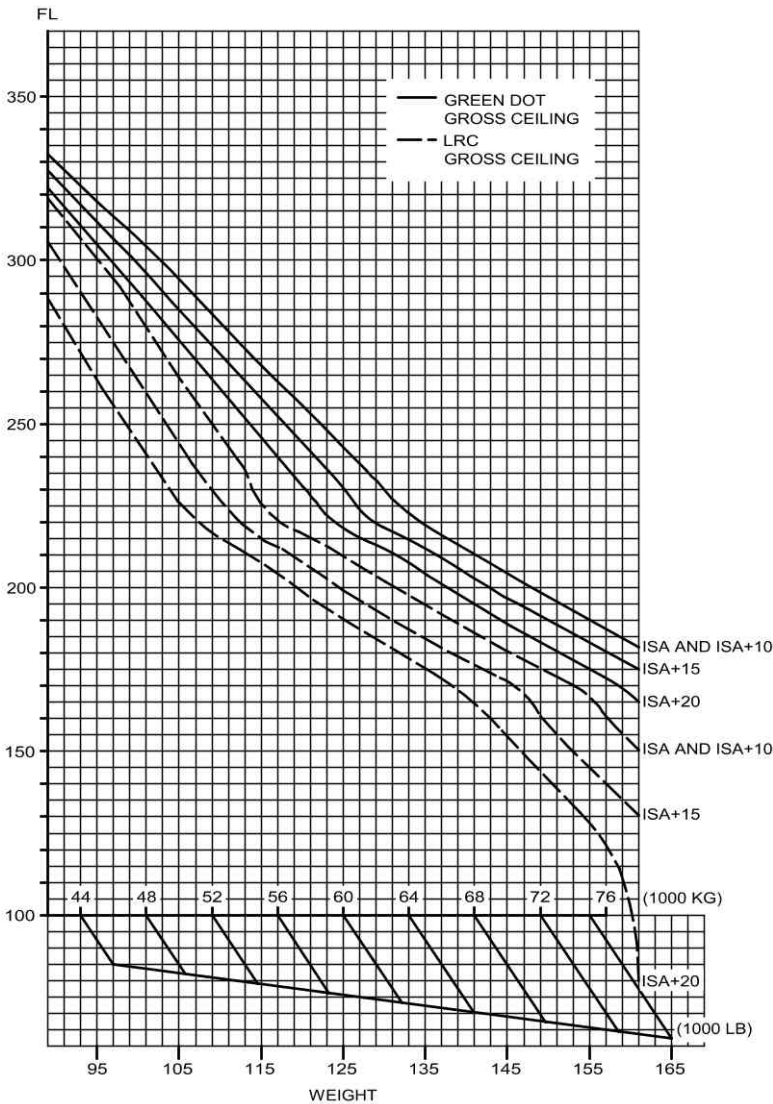
ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

CEILINGS

ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT											
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)			
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)			
ANTI ICE OFF				LEVEL OFF (FT)							
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL										
	250	290	310	330	350	370	390				
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200				
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300				
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200				
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200				
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600				
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100				
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800				
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400				
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100				
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600				
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000					
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400					
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800					
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200					
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600						
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON					
FUEL		+ 14 %				+ 28 %					
TIME		+ 13 %				+ 26 %					
DISTANCE		+ 12 %				+ 23 %					
LEVEL OFF		- 700 ft				- 1800 ft					



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## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)	MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584	
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241	
<b>52</b>	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594	
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246	
<b>54</b>	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602	
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249	
<b>56</b>	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600	
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248	
<b>58</b>	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585	
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242	
<b>60</b>	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562	
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232	
<b>62</b>	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570		
	2434 285	2287 272	2225 266	2248 268	2055 246		
<b>64</b>	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544		
	2454 284	2382 279	2317 272	2272 267	2037 234		
<b>66</b>	1.243 .513	1.322 .556	1.397 .591	1.421 .585			
	2476 284	2432 281	2399 277	2264 263			
<b>68</b>	1.247 .512	1.330 .558	1.412 .599	1.426 .570			
	2499 283	2472 282	2473 280	2253 256			
<b>70</b>	1.254 .514	1.338 .560	1.426 .604	1.436 .543			
	2550 285	2516 283	2537 283	2232 243			
<b>72</b>	1.262 .517	1.351 .567	1.428 .598				
	2604 287	2592 286	2533 280				
<b>74</b>	1.270 .521	1.365 .575	1.432 .587				
	2666 289	2673 290	2523 274				
<b>76</b>	1.290 .539	1.381 .585	1.438 .571				
	2805 299	2767 296	2509 267				
<b>78</b>	1.308 .554	1.395 .593	1.450 .537				
	2927 307	2850 300	2478 250				
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>4/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG PACK FLOW HI ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)  TIME (H.MIN)			
AIR	DIST. FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
(NM)							100	150	200
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %					TOTAL ANTI ICE ON △FUEL = + 6 %				

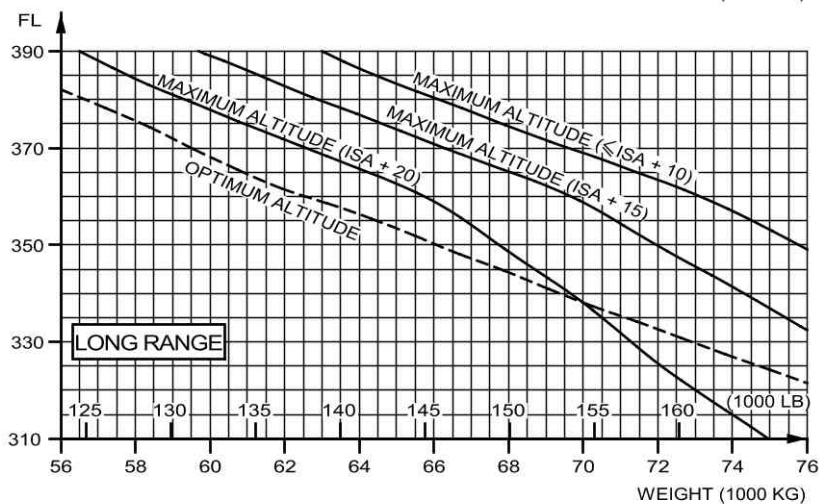
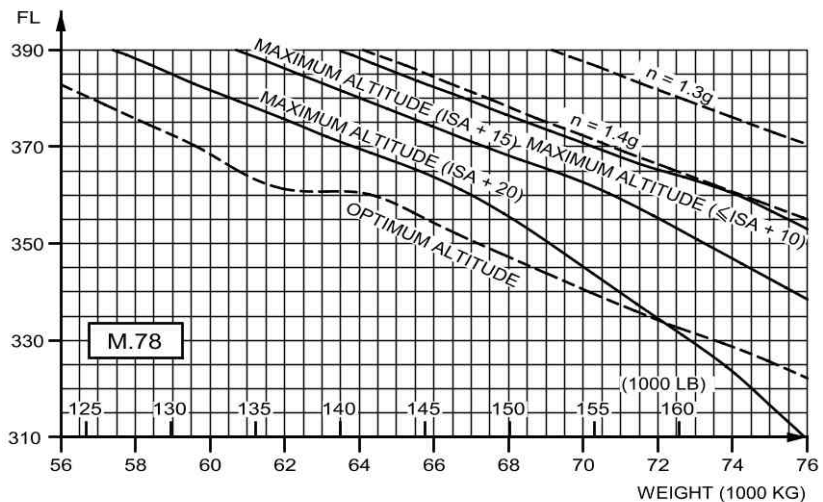
PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NO-04-08-140





## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-AEO</b> <b>2/4</b>
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## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

### ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR  DIST.  (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING △FUEL = - 0.4 %			ENGINE ANTI ICE ON △FUEL = + 3 %			TOTAL ANTI ICE ON △FUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP

CL-NQ-04-10-140

## COST INDEX FOR LONG RANGE CRUISE SPEED

### ALL ENGINES

For a quick determination of the  $CI_{LRC}$ , use:

-  $CI_{LRC} = 40$  kg/min in the FMGC.

or

-  $CI_{LRC} = 55$  (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									
	45				65				
	TIME	FUEL	DIST.	EPR	TIME	FUEL	DIST.	EPR	IAS (KT)
FL	(MIN)	(KG)	(NM)		(MIN)	(KG)	(NM)		
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-AEO</b> <b>4/4</b>
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## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

### ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF						TIME (H.MIN)			
AIR DIST. (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
△FUEL = - 1 %			△FUEL = + 3 %			△FUEL = + 7 %			

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# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

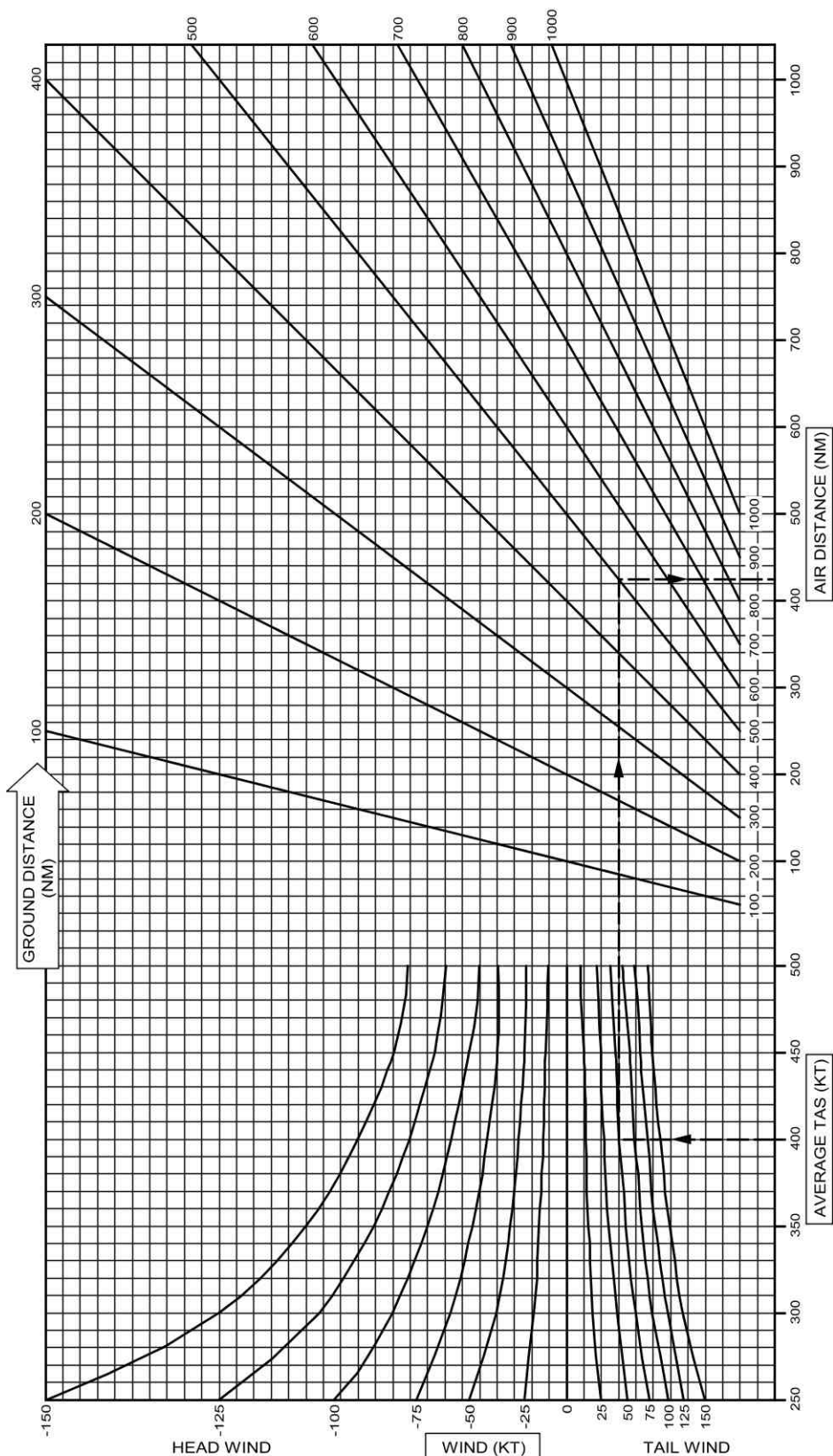
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING ANTI-ICING OFF		ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301	296	293	293	294	296	300
	0.15	0.15	0.15	0.15	0.15	0.15	0.15
60	445	446	450	456	463	472	480
	0.19	0.19	0.19	0.19	0.18	0.18	0.18
80	588	596	606	619	633	648	661
	0.23	0.23	0.23	0.22	0.22	0.21	0.21
100	731	746	762	781	802	824	841
	0.28	0.27	0.27	0.26	0.25	0.25	0.24
120	874	895	918	944	971	999	1021
	0.32	0.31	0.31	0.30	0.29	0.28	0.27
140	1017	1045	1074	1106	1140	1174	1201
	0.36	0.35	0.35	0.34	0.33	0.31	0.30
160	1160	1194	1229	1268	1309	1349	1381
	0.41	0.40	0.39	0.38	0.36	0.35	0.34
180	1302	1343	1385	1430	1477	1524	1560
	0.45	0.44	0.43	0.42	0.40	0.38	0.37
200	1444	1491	1540	1591	1645	1699	1740
	0.50	0.48	0.47	0.45	0.44	0.41	0.40
220	1587	1640	1695	1752	1813	1873	1919
	0.54	0.52	0.51	0.49	0.47	0.45	0.43
240	1728	1788	1849	1914	1981	2048	2098
	0.58	0.56	0.55	0.53	0.51	0.48	0.46
260	1870	1936	2004	2074	2148	2222	2277
	1.03	1.00	0.99	0.97	0.95	0.92	0.90
280	2012	2084	2158	2235	2316	2396	2456
	1.07	1.05	1.03	1.01	0.98	0.95	0.93
300	2153	2232	2312	2396	2483	2570	2634
	1.11	1.09	1.07	1.05	1.02	0.99	0.96
320	2294	2380	2466	2556	2650	2743	2813
	1.16	1.13	1.11	1.09	1.06	1.02	0.99
340	2435	2527	2620	2716	2816	2917	2991
	1.20	1.17	1.15	1.12	1.10	1.05	1.02
360	2576	2674	2773	2876	2983	3090	3169
	1.25	1.21	1.19	1.16	1.13	1.09	1.06
380	2716	2821	2927	3035	3149	3263	3347
	1.29	1.26	1.23	1.20	1.17	1.12	1.09
400	2856	2968	3080	3195	3315	3436	3525
	1.33	1.30	1.27	1.24	1.21	1.16	1.12
420	2997	3114	3233	3354	3480	3609	3702
	1.38	1.34	1.31	1.28	1.25	1.19	1.15
440	3137	3261	3385	3513	3646	3781	3880
	1.42	1.38	1.35	1.32	1.28	1.22	1.19
460	3276	3407	3538	3672	3811	3954	4057
	1.47	1.43	1.39	1.36	1.32	1.26	1.22
480	3416	3553	3690	3830	3977	4126	4235
	1.51	1.47	1.43	1.40	1.36	1.29	1.25
500	3555	3699	3842	3989	4142	4298	4412
	1.56	1.51	1.47	1.44	1.40	1.33	1.29
520	3695	3844	3994	4147	4306	4470	4588
	2.00	1.55	1.51	1.48	1.43	1.36	1.32
540	3834	3990	4146	4305	4471	4642	4765
	2.05	2.00	1.55	1.51	1.47	1.40	1.35
AIR CONDITIONING OFF △FUEL = - 1.5 %		ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 6 %			

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	IN FLIGHT PERFORMANCE	FPE-CAB <b>2/2</b>
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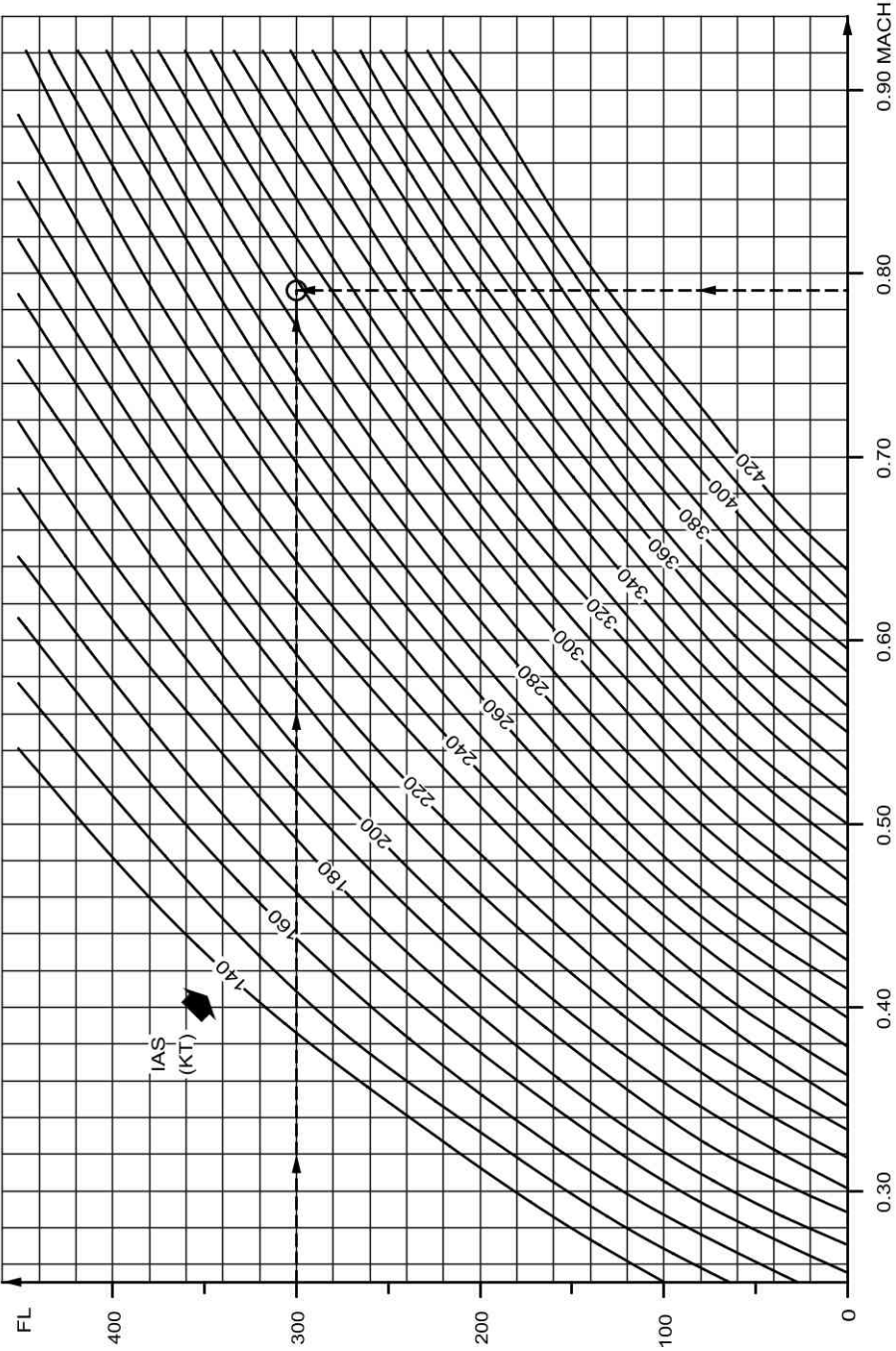
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: *In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.*

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$
 This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$
 This additional fuel must be added to the fuel predictions provided by the FMS.

Note: *Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:*

- *Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or*
- *If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.*

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

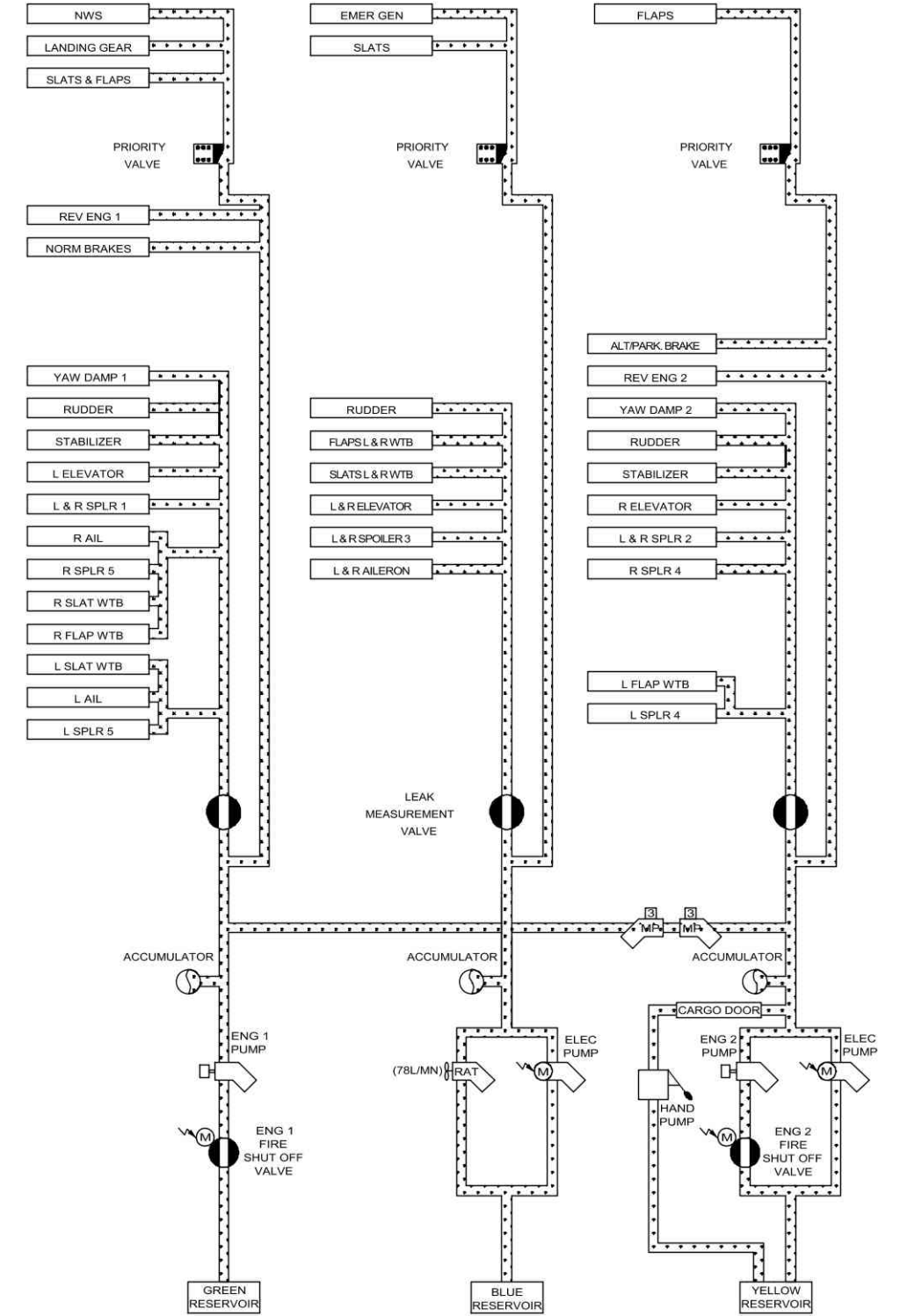
FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

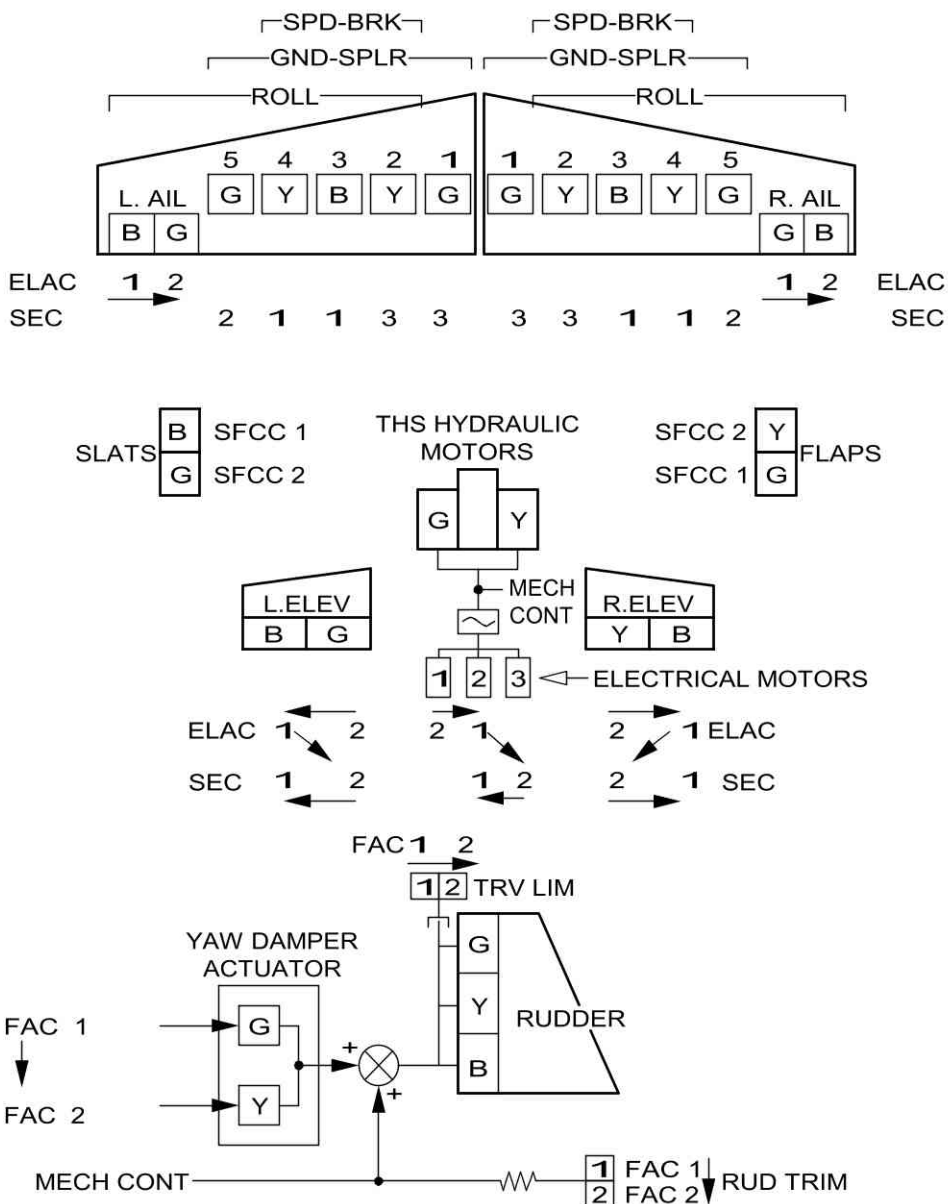
● **FOR APPROACH:**

A/THR in managed speed.....USE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHURST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
ADR/IR	2/2	2/2	3/3	
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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**OEBPROC-PLP PRELIMINARY PAGES**

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**"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight.. 11.01**

**OEBPROC-17 Dual FM Reset upon Radial Fix Info Entry**

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**OEBPROC-28 No Localizer or Glide Slope Capture in Approach**

**No Localizer or Glide Slope Capture in Approach.....28.00**  
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**OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

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**OEBPROC-36 No SRS Engagement During Go Around in the Case of EPR Mode Fault**

**No SRS Engagement During Go Around in the Case of EPR Mode Fault.....36.00**  
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**OEBPROC-38 Erroneous Radio Altimeter Height Indication**

**Erroneous Radio Altimeter Height Indication..... 38.00**  
**Erroneous Radio Altimeter Height Indication..... 38.01**

**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**

**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.00**  
**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.01**

**OEBPROC-43 F/CTL SPOILER FAULT**

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F/CTL SPOILER FAULT.....	43.01

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

L/G GEAR NOT DOWNLOCKED.....	44.00
■ L/G GEAR NOT DOWNLOCKED ■.....	44.01





## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an **ENG 1(2) OIL FILTER CLOG** ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSL					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSL					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSL				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSL				



## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

*Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).*

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## NO LOCALIZER OR GLIDE SLOPE CAPTURE IN APPROACH

Approved by: Head of Flight Operations Support and Services

<b>Reason for issue:</b>	<p>This OEB replaces the A320 OEB 184.</p> <p>Several Operators experienced the following event: LOC* (G/S*) capture mode did not engage when intercepting the localizer (glide slope) during an ILS approach.</p> <p>This OEB provides an explanation of the above-mentioned event, as well as the operational recommendations that the flight crew should apply, in order to intercept the ILS using LOC and G/S modes.</p>
<b>Applicable to:</b>	<p>Aircraft with Rockwell Collins Multi-Mode Receiver (MMR), P/N 822-1152-121 (MOD 26999 or MOD 30631)</p>
<b>Cancelled by:</b>	<p>Refer to the "Cancelled by" section of the associated FCOM OEB.</p>

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No bulletin found



## NO LOCALIZER OR GLIDE SLOPE CAPTURE IN APPROACH

### ECAM ENTRY

None

### PROCEDURE

In accordance with the FCOM Standard Operating Procedures (*Refer to FCOM/PRO-NOR-SOP-18 ILS Approach Pattern*), the flight crew should closely monitor the localizer and glide slope capture, for every ILS approach.

- **If LOC\* mode does not engage when expected, the flight crew should:**

Perform the ILS interception using the LOC raw data deviations. The FD and AP can be used in selected modes (HDG-V/S modes, or preferably TRK-FPA modes) for this purpose.

Consider changing the Master FMGC:

- **If the AP is engaged:**

Change the AP in command

*(If AP1+2 are engaged, change to AP2, by pressing the AP1 pb on the FCU to disengage AP1)*

- **If the AP is disengaged, and the FDs are engaged:**

Turn off FD1

Then, attempt to reengage the LOC and G/S modes, by pressing the APPR pb.

LOC\* (G/S\*) mode should engage as expected, and the ILS can then be flown in LOC and G/S modes. However, the flight crew should disregard the approach capability on the FMA, and perform only a CAT I approach with a manual landing.

Note: *If it is still not possible to intercept the ILS after changing the Master FMGC, the flight crew must perform an ILS approach using raw data. The AP/FD can be used in selected modes (HDG/VS, or preferably TRK/FPA). The flight crew should disarm the APPR (LOC) mode(s) by setting the APPR (LOC) pb to OFF on the FCU, and then perform a CAT I approach with a manual landing.*

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSL				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSL				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## **OEB36 Issue 1.0**

# **NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT**

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

 <div>DRAGONAIR</div> <div>A320/A321</div> <div>QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		36.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSL					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSL					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSL				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSL				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSL				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSL				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



<b>AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)</b>
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- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
PACK (affected bleed side).....OFF

X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

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## OEB43 Issue 2.0

### F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:** This OEB replaces the A320 OEB 208.


- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:** All A318/A319/A320/A321 Aircrafts.  
**Cancelled by:** Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSL				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSL				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above  $V_{FE_{NEXT}}$ , the flight crew should deselect A/THR, decelerate to  $V_{FE_{NEXT}}$ , and select CONF 1 when below  $V_{FE_{NEXT}}$ . When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... $V_{REF} + 10KT$

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers.....x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



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## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSL				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSL				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSM**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSM</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HSM</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HSM</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSM</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HSM</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSM</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSM</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSM</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12


<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

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M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-31	<b>MULTIPLE UNDUE ECAM ALERTS</b>	00013755.0001001	30 MAR 12
	Criteria: 31A1220, 31-1276, P8671, P9824 <b>Applicable to: B-HSM</b> <i>Impacted DU: NONE</i> <u>Reason for issue:</u> <i>This Temporary Revision is issued to give a procedure to the crew in the case of multiple suspected undue ECAM alerts.</i>			

	ABN-80	<b>Computer Reset Table</b>	NG00824	
	ABN-80	<b>Computer Reset Table - 27 - Flight Controls</b>	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSM</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	2238	HDA 0004	B-HSM	320-232


(1) Evolution code : N=New, R=Revised

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTC36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	Applicable to: ALL			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	Applicable to: ALL			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	Applicable to: ALL			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	Applicable to: ALL			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	Applicable to: ALL			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	Applicable to: ALL			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	Applicable to: ALL			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	Applicable to: ALL			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	Applicable to: ALL			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	Applicable to: ALL			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	Applicable to: ALL			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	Applicable to: ALL			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	Applicable to: ALL			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	Applicable to: ALL			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	Applicable to: ALL			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	Applicable to: ALL			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	Applicable to: ALL			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	Applicable to: ALL			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	32-1360 00		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD10 (PRE EM2) FROM BSCU STD L4.9B (EM2).
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	P7062		30 AUG 10	OXYGEN - CREW OXYGEN - INSTALL ALTERNATIVE 115CU FT FLIGHT CREW OXYGEN CYLINDER COMPOSITE SCOTT P/N 897940-15
	Applicable to: ALL			
	32-1369 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INTRODUCE BSCU STD 10.1 - SB ONLY.
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			
	K7727		30 AUG 10	EQUIPMENT/FURNISHINGS - MISCELLANEOUS EMERGENCY EQPT - INSTALL AN HONEYWELL ELT WITH CONTROL PANEL IN COCKPIT
	Applicable to: ALL			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	Applicable to: ALL			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.



## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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## **ABN-PLP PRELIMINARY PAGES**

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## **ABN-21 Air Conditioning/Ventilation/Pressurization**

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## **ABN-22 Auto Flight**

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<b>LOW ENERGY WARNING.....</b>	<b>22.02</b>

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<b>ELEC EMER CONFIG Summary.....</b>	<b>24.02</b>

## **ABN-25 Equipment**

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CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● If  $\Delta P > 9$  PSI

PACK 1+2.....OFF


**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.
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## LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### ■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:

#### ● When the system has recovered:

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### ■ DESCENT (IF TIME PERMITS) :

#### ● When the system has recovered:

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		



**ELEC EMER CONFIG SYS REMAINING**

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



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ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
PNEU	ISIS	Norm	Norm	Norm
	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
APU	X BLEED (MAN CTL)	Norm	Inop	Inop
	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
PWR PLT	FUEL PUMP	Norm	Norm	Norm
	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
MISC	HP FUEL VALVE closure	Norm	Norm	Norm
	MECH HORN	Norm	Norm	Norm

(a)

Restored, when speed is below 100 kt.

(b)

Crew oxygen valve inoperative.

(c)

Lost, when speed is below 50 kt.

(d)

Lost 30 s after last engine shutdown.

(e)


IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f)

For APU start only.

(g)

Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
<b>DRY Runway</b>	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● If one or more electrical latches (strikes) are faulty:

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:


COCKPIT DOOR sw..... SET to NORM

● If two pressure sensors are faulty:

Automatic latch release is not available, in case of cockpit decompression.

● If no LED on the CKPT DOOR CONT panel is on:

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT..... ON
- **If fuel vapors:**

CAB FANS.....ON
 

PACK 1+2..... OFF
- **If no fuel vapors:**

CAB FANS..... OFF
 

PACK FLOW..... HI
- LDG ELEV..... 10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE
- ATC..... NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.
- **At FL 100 OR MEA:**

APU MASTER SW (if in ELEC EMER CONFIG)... ON
 

PACK 1+2..... OFF
 

MODE SEL.....MAN
 

MAN V/S CTL..... FULL UP
 

RAM AIR.....ON
 

APU MASTER SW.....OFF

● **If smoke persists, open CKPT window:**

MAX SPEED.....200 KT
 

COCKPIT DOOR.....OPEN
 

HEADSETS..... ON
 

PNF COCKPIT WINDOW..... OPEN
- 
- HDA A320/A321 For A/C: B-HSM

**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMERG
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT.....ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATE:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL.....CONSIDER  
 ELEC EMER CONFIG.....CONSIDER  
*Refer to the end of the procedure to Set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING.....CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

- **IF AIR COND SMOKE SUSPECTED:**  
 APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 PACK 1..... OFF  
 ● **If smoke continues:**  
 PACK 1..... ON  
 PACK 2..... OFF  
 ● **If smoke still continues:**  
 PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ● **IF CAB EQUIPMENT SMOKE SUSPECTED:**  
 ● **If smoke continues:**  
 EMER EXIT LIGHT..... ON  
 COMMERCIAL..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE  
 ● **If smoke still continues or if faulty  
equipment confirmed isolated:**  
 COMMERCIAL..... NORM  
 SMOKE/FUMES REMOVAL..... CONSIDER





## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

#### ● WHEN EMER GEN AVAIL:

APU GEN.....OFF  
GEN 2..... OFF

### ELEC EMER CONFIG


APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

#### ● AT 3 min OR 2 000 ft AAL BEFORE LANDING:

GEN 2.....ON  
EMER ELEC GEN 1 LINE.....ON

#### ● WHEN A/C IS STOPPED:

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt

Note:


- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED


Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
Slats					
S = 0	NO LIMITATION	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1	230 kt				
S = 1					
1 < S ≤ 3	200 kt		200 kt	185 kt	177 kt
S > 3	177 kt		177 kt	177 kt	177 kt

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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SIDESTICK/RUDDER PEDALS STIFF		
<p>Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:</p> <ul style="list-style-type: none"><li>- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or</li><li>- One sidestick and the rudder pedals at the same time.</li></ul> <p>The piloting technique remains the same: The aircraft remains responsive.</p> <p>However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.</p> <p>AP DISENGAGEMENT..... CONFIRM</p> <p>CONSIDER TRANSFERRING CONTROL TO PNF</p> <p>● <b>FOR DECRAB, ROLLOUT, OR ENGINE FAILURE</b></p> <p>BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL</p>		



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

**STABILIZER JAM**

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.  
 AP..... OFF  
 MAN PITCH TRIM.....CHECK  
*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

- IF MAN TRIM AVAIL:**  
 TRIM FOR NEUTRAL ELEV  
*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

- IF MAN TRIM NOT AVAIL:**  
 FOR LDG.....USE FLAP 3  
*Do not select configuration full so as not to degrade the handling qualities.*  
 GPWS LDG FLAP 3..... ON  
 CAT 2 INOP

FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON

- **On the lighter side and in the center tank:**  
FUEL PUMPS.....OFF
- **When fuel is balanced:**  
FUEL PUMPS (WING + CTR)..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.







## FUEL LEAK (Cont'd)

ENGINE RESTART..... CONSIDER

**CAUTION**

Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.

■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

● **If fuel smell in the cabin:**

APU (if ON)..... OFF

*This prevents additional fuel loss through the APU feeding line.*

● **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**

CTR TK PUMP 1+2..... ON

### FOR LANDING

**CAUTION**

Do not use reversers.

GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147


APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75								
<b>CONTA runway (CONF 3)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/0.77  
 MANEUVER WITH CARE  
 ALTN LAW : PROT LOST

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

### APPROACH

CAT 2 INOP  
 SLATS SLOW / FLAPS JAMMED  
 GPWS FLAP MODE..... OFF  
 ● **For Flaps extension:**  
 SPD SEL..... VFE NEXT - 5KT  
 When in landing CONF : DECELERATE TO CALCULATED VAPP  
 Stabilize at VAPP before L/G down, to be trimmed for approach.  
 L/G GRAVITY EXTENSION

### LANDING


**FLARE:** PITCH AUTHORITY REDUCED (No stabilizer).  
 MAN TRIM Unusable  
 Only 1 spoiler per wing – Direct law  
**SPOILERS:** Only 1 per wing  
**NO REVERSER**  
**BRAKING:** BRK Y ACCU PR ONLY (7 applications)  
 MAX BRK PR 1 000 PSI  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption  
 ● **For circuit:**  
 MAINTAIN SLATS/FLAPS CONFIGURATION  
 Recommended speed: MAX SPD - 10 kt  
 ● **For diversion:**  
 ● **If Flaps at zero:**  
 SELECT CLEAN CONFIGURATION  
 Normal operating speeds  
 ● **If Flaps not at zero:**  
 MAINTAIN SLATS/FLAPS CONFIG  
 Recommended speed: MAX SPD - 10 kt

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV										
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78	
<b>DRY runway</b>	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15									
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10									
<b>CORRECTIONS</b>	+ 1 000 ft above SL					+ 10 kt tailwind				
<b>DRY runway</b>	+ 3 %					+ 18 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).


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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or INVALID DATA message),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, ECAM DUs or MCDU 1 is(are) affected.

GEN 1 .....OFF

#### ■ If DUs do not stop flashing:

GEN 1 ..... ON

#### ■ If DUs stop flashing:

GEN 1 .....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR .....AS RQRD

APU START ..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2 .....OFF

#### ■ If DUs do not stop flashing:

GEN 2 ..... ON

#### ■ If DUs stop flashing:

GEN 2 .....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR .....AS RQRD

APU START ..... CONSIDER

### ■ DU is blank (with or without a large letter “F” in amber), or the display is distorted:

DU (affected) .....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected) ..... USE

*Transfer SD to the F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected) .....USE

### ■ INVALID DISPLAY UNIT message is displayed:

This may be caused by a DU failure.

FOR AUTOMATIC DU RECOVERY .....WAIT MORE THAN 40 s



DISPLAY UNIT FAILURE (Cont'd)

- **IF DU IS AUTOMATICALLY RECOVERED:**  
 No crew action is required.
  
- **IF DU IS NOT RECOVERED:**  
 Non-recovered DU..... AS RQRD  
*The DU can be switched off.*
  
- **INVALID DATA message appears (not on all DUs):**  
 EIS DMC SWITCHING..... AS RQRD
  
- **If unsuccessful:**  
 DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
  
- **INVALID DATA message appears on all DUs:**  
 The autopilot, autothrust and MCDU navigation data are still available, and may be used.  
 FOR AUTOMATIC DUs RECOVERY ..... WAIT MORE THAN 40 s
  
- **IF ALL DUs ARE AUTOMATICALLY RECOVERED:**  
 No crew action is required.
  
- **IF ONE OR MORE DUs ARE NOT RECOVERED:**  
 Non-recovered DUs..... OFF FOR 40 s  
 Non-recovered DUs..... BACK ON sequentially
  - **If the initial failure re-occurs (INVALID DATA message appears on all DUs), when switching a given DU back ON:**  
 Apply the entire procedure again, from the beginning.  
 Leave this specific DU permanently OFF.
  
- **INVERSION OF THE EWD AND THE SD:**  
 ECAM UPPER DISPLAY ..... OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

MULTIPLE UNDUE ECAM ALERTS

- In the case of multiple undue ECAM alerts concerning :
- ENG 1(2) N1(N2) (EGT) (FF) OVER LIMIT or
  - ENG 1(2) N1(N2) (EGT) (EPR) (FF) DISCREPANCY or,
  - NAV ATT(ALT) (HDG) DISCREPANCY or,
  - NAV FM/GPS POS DISAGREE or,
  - FUEL F.USED/FOB DISAGREE or,
  - MINIMUM or HUNDRED ABOVE callouts,

possibly associated with EFIS red flags, apply the below procedure :

AFFECTED PARAMETERS..... CROSSCHECK

Crosscheck the affected parameters on the E/WD, PFD, ND or on the related SD page to confirm that the alerts are spurious.

- **If it is confirmed that the ECAM alerts are spurious, identify the faulty DMC :**  
EIS DMC SWITCH.....CAPT 3  
*DMC 3 replaces DMC 1. If the undue alerts stop, DMC 1 is the faulty DMC.*
- **If unsuccessful :**  
EIS DMC SWITCH.....F/O 3  
*DMC 3 replaces DMC 2. If the undue alerts stop, DMC 2 is the faulty DMC.*

LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

## LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <b>L/G GEAR NOT DOWN</b> ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOMELT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.







## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### **WHEN A/C STOPPED**

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE


- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

#### **F/CTL ALTN LAW**

#### **(PROT LOST)**

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

#### **APPR PROC:**

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### ● **FOR L/G GRVTY EXTN (not on the ECAM):**

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### **INOP SYS**

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### **Other INOP SYS**

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT



ADR 1 + 2 + 3 FAULT (Cont'd)


● DURING FINAL APPR

V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*

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NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

- The following procedure is not displayed on the ECAM:
- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.
  - **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.
    - **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
    - **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
- **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

■ **MCDU INITIALIZATION:**

- DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*
- IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*
- A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*

■ **CDU INITIALIZATION:**

- Depending on the CDU keyboard installed, an “H” may be written on the “5” key:
- **If “H” is written on the “5” key:**
- H KEY.....PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*
- A/C HEADING..... ENTER
- **If “H” is not written on the “5” key:**
- A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG–ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.





## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s).....OFF  
 REMAINING AIR DATA.....CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR.....KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs.....OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF.....USE FLAP 3

APP SPD.....VLS +10

LDG DIST PROC.....APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST.....CLB

FLAPS.....RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	250 kt	10.0/CLB	10.5/CLB	11.5/CLB
FL 50 - FL 100		9.0/CLB	9.5/CLB	10.0/CLB
FL 100 - FL 150		8.0/CLB	8.5/CLB	8.5/CLB
FL 150 - FL 200		7.0/CLB	7.0/CLB	7.0/CLB
FL 200 - FL 250	275 kt	5.0/CLB	5.0/CLB	5.0/CLB
FL 250 - FL 320		4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200-FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320-FL 200	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE
FL 200 - FL 100	250 kt	1.5/IDLE	0.5/IDLE	-0.5/IDLE
Below FL 100	250 kt	1.0/IDLE	0.0/IDLE	-1.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.5/IDLE	2.5/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 67 t	67 t - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.5/55.7	5.5/51.5	6.0/47.3
1	S	7.5/58.2	7.5/54.0	7.5/49.0
1+F <sup>(1)</sup>	S	4.5/60.2	4.5/56.1	4.5/51.2
2	F	9.0/61.7	9.0/57.3	9.0/52.8



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	7.5/67.2	7.5/62.7	7.5/57.9

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

### FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 67 t	67 t - 55 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	4.5/48.0	4.5/44.4	4.5/41.4


**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :
  - X BLEED..... CHECK OPEN
  - DESCENT TO FL200/MEA.....CONTINUE
  - Descend rapidly to FL 200, to recover the bleed supply from the APU*
  - APU.....START
  - Start the APU during the descent.*
- AT, OR BELOW, FL200 :
  - WING A.ICE..... OFF
  - APU BLEED must not be used for wing anti-ice.*
  - APU BLEED..... ON
  - MAX FL200
  - AVOID ICING CONDITIONS
- IF ICE ACCRETION
  - APPR SPD.....VLS + 10 KT
  - LDG DIST PROC..... APPLY
  - Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*



ENG DUAL FAILURE - FUEL REMAINING


Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :  
**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THR LEVERS..... IDLE  
FAC 1.....OFF THEN ON  
ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.  
OPTIMUM RELIGHT SPD.....280 KT

*Note:* In the case of an “ENG DUAL FAILURE” during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.  
In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).  
LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*  
VHF1/HF1  /ATC1.....USE  
ATC.....NOTIFY

- IF NO RELIGHT AFTER 30 SEC:  
ENG MASTERS..... OFF 30 S/ON  
*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*
- IF UNSUCCESSFUL:  
CREW OXY MASKS (Above FL 100).....ON
  - WHEN BELOW FL 250  
APU (IF AVAIL)..... START
  - WHEN BELOW FL 200  
WING ANTI ICE..... OFF  
APU BLEED..... ON  
ENG MASTERS (one at a time)..... OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*



## ENG DUAL FAILURE - NO FUEL REMAINING

The flight crew should apply this paper procedure and then, if time permits, clear ECAM warnings and check the ECAM STATUS page.

THRUST LEVERS..... IDLE

FAC 1.....OFF THEN ON

*Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.*

OPTIMUM SPEED.....220 KT/GREEN DOT

*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

EMER ELEC POWER (if EMER GEN not in line).....MAN ON

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

CREW OXY MASKS (Above FL 100).....ON

CABIN AND COCKPIT.....PREPARE

SIGNS.....ON

COMMERCIAL.....OFF

USE RUDDER WITH CARE

### ● WHEN BELOW FL 150

RAM AIR..... ON

## COMMON ACTIONS FOR THE APPROACH

### APPROACH PREPARATION

Note: *Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).*

BARO..... SET

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

## IF FORCED LANDING ANTICIPATED

### APPROACH

FOR LDG.....USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**  
CABIN.....NOTIFY FOR LANDING


**AT 500 FT AGL**  
BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**  
ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

- AFTER LANDING**
- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

    - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
    - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**  
FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*


## ENG RELIGHT (IN FLIGHT)

- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.

Engine light up should be achieved within 30 s after fuel flow increases.

- **When idle is reached:**

ENG MODE SEL.....	NORM
TCAS MODE SEL  .....	check TA/RA

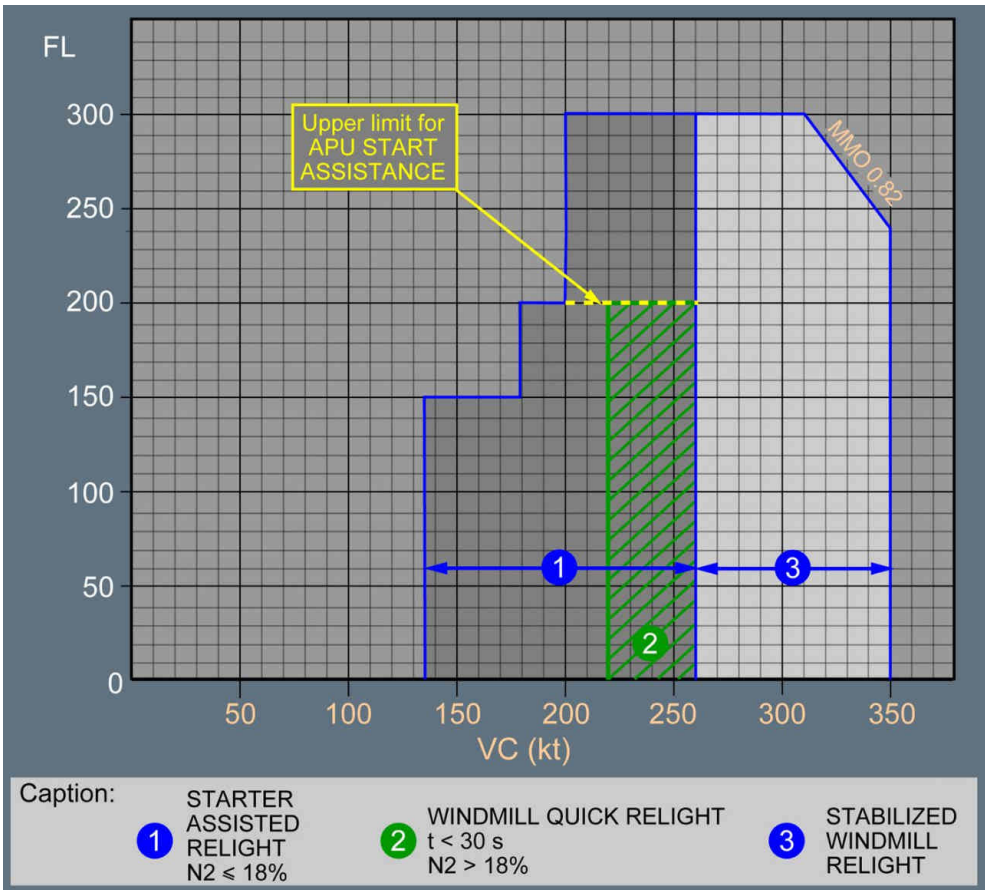
Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.

Affected SYS.....	RESTORE
-------------------	---------

- **If no relight:**

ENG MASTER (affected).....	OFF
----------------------------	-----

Wait 30 s before attempting a new start (to drain the engine).







## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION

External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF


ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

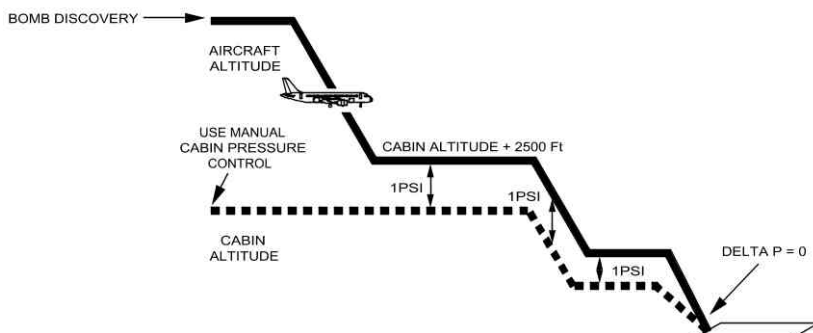
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE
<i>Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.</i>	
NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN
<i>Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.</i>	
DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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BOMB ON BOARD (Cont'd)

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

*The cabin crews must command passengers to switch off all portable electronic devices.*

BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

● If the bomb can be moved:

RH AFT CABIN DOOR SLIDE..... DISARM

LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

CAUTION

DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

BOMB INDICATION LINE..... POSITION

Note:

*A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

BOMB..... MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

CAUTION

Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.





**BOMB ON BOARD (Cont'd)**

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE  
*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

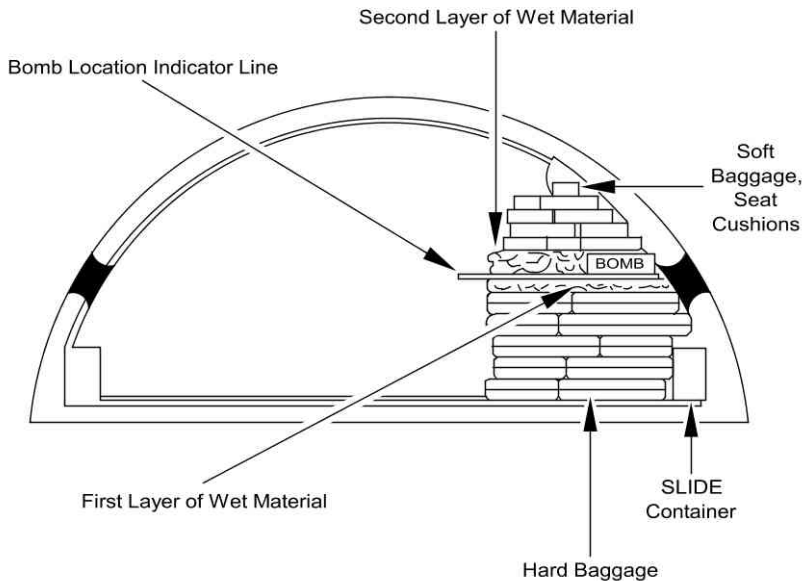
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

LRBL STACK




PASSENGERS.....MOVE/ADVISE  
*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW  
*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
<i>Evacuate through normal and emergency exits on the opposite side of the “bomb” location. Do not use the door just opposite the “bomb”.</i>		
<i>Use all available airport facilities to disembark without delay.</i>		



## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS..... MAX AVAIL

GND SPLR.....ARM

MAX BRK PR..... 1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE



	FORCED LANDING (Cont'd)	
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ELT..... CHECK EMITTING <i>If not, switch on the transmitter.</i>		
■ <b>If Evacuation not required:</b>		
CABIN CREW and PASSENGERS (PA)..... NOTIFY		

**EMER DESCENT**


**IMMEDIATE ACTION**

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)  
*The flight crew must inform the cabin of emergency descent on the PA system.*  
 SIGNS.....ON  
*The recommendation is to descend with the AP engaged :*  
 - Turn the ALT selector knob and pull  
 - Turn the HDG selector knob and pull  
 - Adjust the target SPD/MACH.  
 THR LEVERS(if A/THR not engaged)..... IDLE  
 - If autothrust is engaged, check that THR IDLE is displayed on the FMA.  
 - If not engaged, retard the thrust levers.  
 SPD BRK..... FULL  
*Extension of the speedbrakes will significantly increase Vls.*  
*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*

**WHEN DESCENT ESTABLISHED**

EMER DESCENT FL100, or minimum allowable altitude.  
 SPEED.....MAX/APPROPRIATE

<b>CAUTION</b>	<i>Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.</i>
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*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*  
*Note: The recommendation is to descend with the autopilot engaged.*  
*Use of the autopilot is also permitted in EXPEDITE mode .*  
 ENG MODE SEL.....IGN  
 ATC.....NOTIFY  
*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*  
 ATC XPDR 7700.....CONSIDER  
*Squawk 7700 unless otherwise specified by ATC.*  
*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*  
 MAX FL..... 100/MEA  
 ● **IF CAB ALT > 14 000 ft:**  
 PAX OXY MASKS..... MAN ON  
*This action confirms that the passenger oxygen masks are released.*  
*Note: Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

*Use the ECAM flap setting, if required for abnormal operations. In all other cases :*

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.*

Note:     *For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.*

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

*Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.*

● **In the final approach stages**

TARGET SPEED..... VLS

*Reduce the selected speed on the FCU to reach VLS at runway threshold.*

*Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).*

● **At main landing gear touchdown**

REVERSE THRUST..... USE MAX AVAILABLE

● **After nosewheel touchdown**

BRAKES.....APPLY AS NECESSARY

*Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.*

● **Landing complete**

BRAKE FANS  ..... ON

*Be prepared for tire deflation, if temperatures exceed 800 °C.*

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								

# STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

NOSE DOWN PITCH CONTROL..... APPLY  
*This will reduce angle of attack*

*Note:*     In case of lack of pitch down authority, reducing thrust may be necessary.

BANK..... WINGS LEVEL

● **When out of stall (no longer stall indications) :**

THRUST..... INCREASE SMOOTHLY AS NEEDED

*Note:*     In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

SPEEDBRAKES..... CHECK RETRACTED

FLIGHT PATH..... RECOVER SMOOTHLY

● **If in clean configuration and below 20 000 ft:**

FLAP 1..... SELECT

*Note:*     If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

# STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

THRUST..... TOGA

At the same time:

PITCH ATTITUDE..... 15 °

BANK..... WINGS LEVEL

*Note:*     When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.



TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.  
Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- **If the aircraft enters a volcanic ash cloud:**

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
PACK FLOW.....	HI

*Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.*

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

*If airspeed is unreliable or lost, Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.*

*Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed. In case of engine failure, switch off the wing anti ice before engine restart.*

*Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

*Due to the increased noise level, pay particular attention to visual warnings.*



## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.





## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*

Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

WINDSHIELD/WINDOW ARCING

Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)



## WINDSHIELD/WINDOW CRACKED

DIAGNOSIS OF INNER PLY.....PERFORM

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL..... 230/MEA

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

CAB PRESS MODE SEL..... MAN

MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


CAB PRESS MODE SEL..... AUTO

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

CAB PRESS MODE SEL..... MAN

MAN V/S CTL..... FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>
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SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
OXY	Cockpit oxygen bottle pressure < 600 PSI.	If mask is not being used, check if it is correctly stowed.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).





## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION

$$VAPP = VREF + \Delta VREF + APPR COR$$

=

VREF												
Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78	
VREF (KT) = VLS CONF FULL	CG < 25%	108	113	118	123	127	131	136	140	144	148	149
	CG ≥ 25%	106	111	116	121	125	129	134	138	142	146	147

+

$\Delta VREF^{(1)}$

+

APPRoach CORrection		
if $\Delta VREF \leq 10$ kt	if $10 \text{ kt} < \Delta VREF < 20$ kt	if $\Delta VREF \geq 20$ kt
APPR COR is the Highest of		
5 kt * if A/THR ON and / or in case of ice accretion**	1/3 Headwind Max = 15 kt	APPR COR = 1/3 Headwind Max = 10 kt
APPR COR + $\Delta VREF$ limited to 20 kt		APPR COR = 0 kt

\* Multiply the landing distance by an additional factor of 1.1

\*\* In CONF3, add another 5 knot speed increment and multiply the landing distance by an additional factor of 1.2 (instead of 1.1)

=

$$VAPP = VREF + \Delta VREF + APPR COR$$

TO BE INSERTED IN THE MCDU PERF APPR PAGE

(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:


Failure : ALTN LAW  
Flight Conditions : Autothrust ON, ice accretion  
Landing Configuration : CONF 3  
Headwind : 12 kt  
Landing Weight/CG : 48 t/25 %  
VREF determined from the landing weight : 116 kt  
VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt}/3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136 \text{ kt}$$

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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors "WITHOUT REV"** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors "WITH REV"** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note: *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column ("WITH REV." or "WITHOUT REV.")
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:


FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
	3	10			1.40×1.90×1.1=3.00
RESULT	3	10			

$VREF = 131\text{ kt.}$  Therefore  $VAPP = 131 + 10 + 5 = 146\text{ kt.}$

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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
---------------------------------------------------

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



*Continued from the previous page*


DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	if there is ice accretion				
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
NAV	IR 1+2+3 FAULT	3	10	1.85	1.85
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.40*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1  3	55 (APPR) 40 (THRESHOLD) 10	2.00*  1.35*	1.90*  1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*





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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
NAV	IR 1+2+3 FAULT	3	10	1.45	1.45
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.35*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.


The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:



- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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				30 MAR 12
<b>COMPUTER RESET TABLE</b>				
ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset	
21	<u>VENT</u> AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B Y 17 on 122VU</li><li>- Wait 1 s before pushing the C/B.</li></ul>	
22	<u>AUTO FLT</u> FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul>	
22	<u>AUTO FLT</u> FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s</li><li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"><li>- RE-ENTER the barometer altimeter setting value, if necessary.</li></ul>	




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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<b>On ground, or in flight:</b> Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT & PURS CAPT sw to the CAPT only position. Wait for 3 s. <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<b>On ground, or in flight:</b> The flight crew must reset all the RMPs one after the other via the RMP control panel: <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<div>On ground, or in flight</div> <div><div>- Set ELAC 1(2) pb to OFF</div><div>- Wait 3 s,</div><div>- Set ELAC 1(2) pb to ON</div></div> <div><div>CAUTION</div><div>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</div></div> <div>Note: If both ELACs are failed, reset one ELAC after the other.</div>
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<div><div>WARNING</div><div>Do not reset more than one computer at a time.</div></div> <div>Note: If a reset is performed, the flight crew must then perform a flight controls check.</div>
	ELAC or SEC malfunction	ELAC or SEC	<div><div>WARNING</div><div><div>Do not reset more than one computer at a time.</div><div><div>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</div></div></div><div><div>Note:</div><div><div>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</div><div>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</div></div></div></div>
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<div>On ground, or in flight:</div> <div><div>- Pull the 3 C/B:</div><div><div>• Channel 1 (A13 on 49VU)</div><div>• Channel 2 (M27 on 121VU)</div><div>• Channel 1 and 2 (L26 on 121VU)</div></div><div>- Wait 5 s, before pushing the 3 C/B.</div></div> <div>Note: The fuel quantity indication will be re-established within 1 min.</div> <div><div>CAUTION</div><div><div>The FUEL AUTO FEED FAULT caution will be lost for the remainder of the flight.</div><div>In flight:</div><div><div>- If center tank is not empty, while one inner tank contains less than 5 000 kg (11 000 lb) of fuel:</div><div><div>• FUEL MODE SEL (MAN)</div></div><div>- When center tank is empty:</div><div><div>• CTR TK PUMP 1 and 2 (OFF)</div><div>• FUEL MODE SEL (MAN)</div></div></div></div></div>



Continued from the previous page

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>








*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><b>Note:</b> After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><b>Note:</b> After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><b>Note:</b> After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1: <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2: <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
	ISIS malfunction	ISIS	<b>On ground only:</b> With aircraft not moving: <ul style="list-style-type: none"> <li>- Pull C/B F12 on 49VU,</li> <li>- Wait 5 s, then push the C/B,</li> <li>- Normal operation is expected after approximately 2 min.</li> </ul> <i>Note:</i> In the case of small aircraft motion during the C/B reset (refueling, cargo loading conditions, etc.), the ATT red flag may appear on the ISIS. In this case, press the RST P/B for 2 s, and wait 2 min to recover normal operation.
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.  <b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

# **COMPANY PROCEDURES**

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**LOW VISIBILITY OPERATIONS (LVO)**

● **TAXI/LINE UP**

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

● **DESCENT PREPARATION**

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

● **APPROACH: REVERSION**

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## **RNAV (GNSS) / RNAV (RNP) APPROACH**

### **● APPROACH PREPARATION**

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### **● APPROACH GUIDANCE**

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### **● AFTER COMMENCING APPROACH: NAVIGATION ALERTS**

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
 Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
<b>BEFORE TAKEOFF Checklist</b>	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

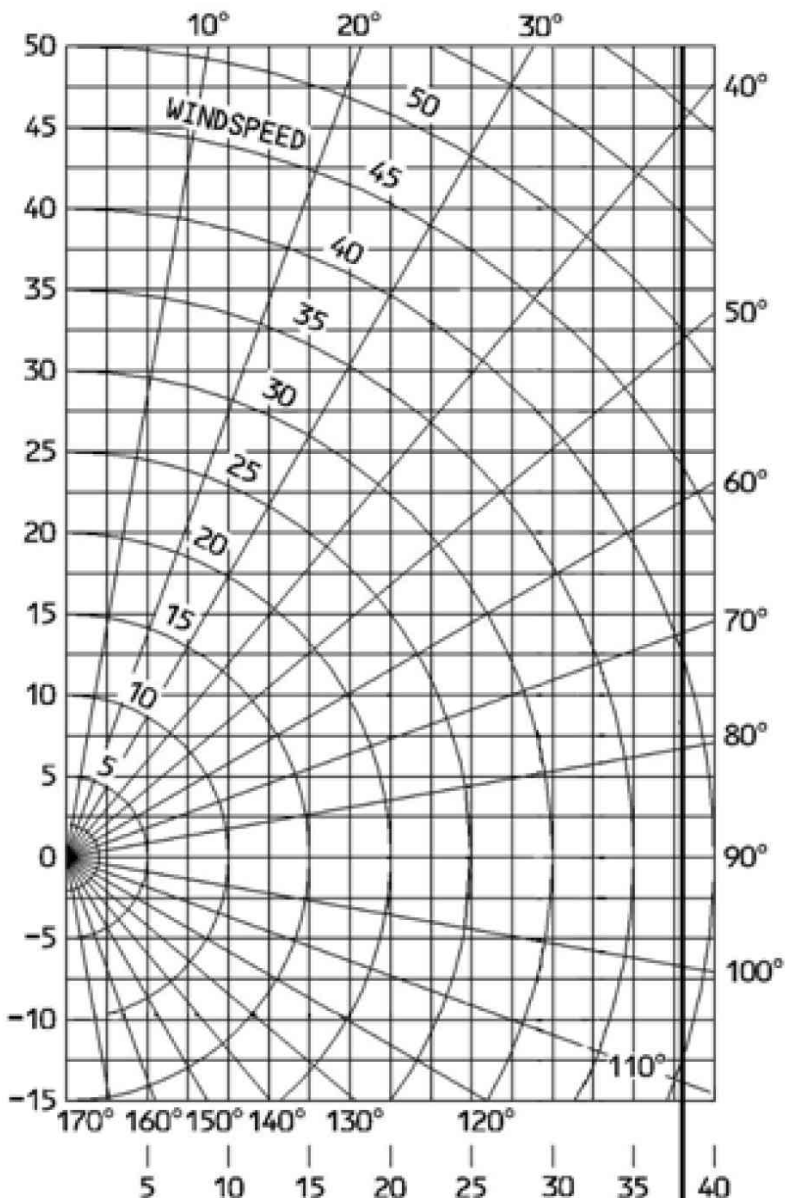
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
					AUTO BRK FAULT		02	
	FLAPS < 1	S < 1	02	NAV	IR 1+2+3 FAULT		01	
			S ≥ 1		03	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02
	1 ≤ FLAPS < 2	S < 1	04		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT			03
			S ≥ 1			05		
	2 ≤ FLAPS < 3	S < 1	06	BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01	
			S ≥ 1		07			
	FLAP = 3	S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	09	REV UNLOCK with buffet (CONF 3)		02		
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
	FLAP > 3	S < 1	11					
		1 ≤ S ≤ 3	12					
S > 3		13						
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	COMPANY PROCEDURES	CP-FAIL <b>2/2</b>
		30 MAR 12

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**IN FLIGHT PERFORMANCE**

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b> <b>TABLE OF CONTENTS</b>	<b>FPE</b> <b>1/2</b> 30 MAR 12
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SPEEDS

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	IN FLIGHT PERFORMANCE	FPE-SPD <b>2/2</b>
		30 MAR 12

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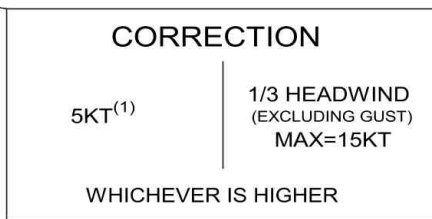
## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152

+



=

**VAPP**

$$V_{APP}^{(2)} = \text{MAX}(VLS + 5Kt^{(1)}; VLS + W_{IND} \text{ CORR})$$

1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-IFL</b> <b>2/4</b>
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LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %	+16 %	+24 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+3 %
2 reversers operative	-5 %	-12 %	-15 %	-14 %	-12 %	-27 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note:    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 × 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 × 1.06 × 1.08 = 1 020 m.

**LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL**

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +3
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

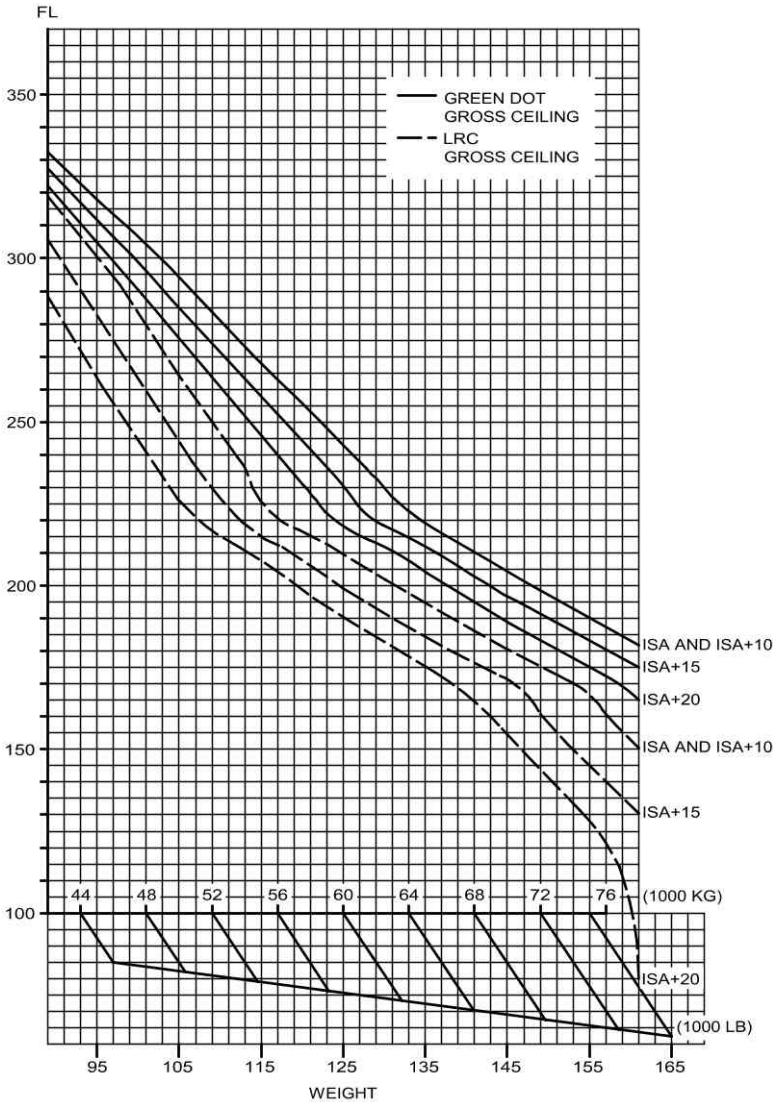
Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).



CEILINGS

ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT										
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)		
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)		
ANTI ICE OFF				LEVEL OFF (FT)						
INIT. GW	INITIAL FLIGHT LEVEL									
(1000KG)	250	290	310	330	350	370	390			
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200			
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300			
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200			
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200			
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600			
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100			
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800			
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400			
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100			
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600			
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000				
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400				
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800				
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200				
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600					
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON				
FUEL		+ 14 %				+ 28 %				
TIME		+ 13 %				+ 26 %				
DISTANCE		+ 12 %				+ 23 %				
LEVEL OFF		- 700 ft				- 1800 ft				

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b>
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## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)	MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584	
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241	
<b>52</b>	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594	
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246	
<b>54</b>	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602	
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249	
<b>56</b>	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600	
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248	
<b>58</b>	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585	
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242	
<b>60</b>	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562	
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232	
<b>62</b>	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570		
	2434 285	2287 272	2225 266	2248 268	2055 246		
<b>64</b>	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544		
	2454 284	2382 279	2317 272	2272 267	2037 234		
<b>66</b>	1.243 .513	1.322 .556	1.397 .591	1.421 .585			
	2476 284	2432 281	2399 277	2264 263			
<b>68</b>	1.247 .512	1.330 .558	1.412 .599	1.426 .570			
	2499 283	2472 282	2473 280	2253 256			
<b>70</b>	1.254 .514	1.338 .560	1.426 .604	1.436 .543			
	2550 285	2516 283	2537 283	2232 243			
<b>72</b>	1.262 .517	1.351 .567	1.428 .598				
	2604 287	2592 286	2533 280				
<b>74</b>	1.270 .521	1.365 .575	1.432 .587				
	2666 289	2673 290	2523 274				
<b>76</b>	1.290 .539	1.381 .585	1.438 .571				
	2805 299	2767 296	2509 267				
<b>78</b>	1.308 .554	1.395 .593	1.450 .537				
	2927 307	2850 300	2478 250				
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %			

IN CRUISE QUICK CHECK LONG RANGE

ONE ENGINE OUT

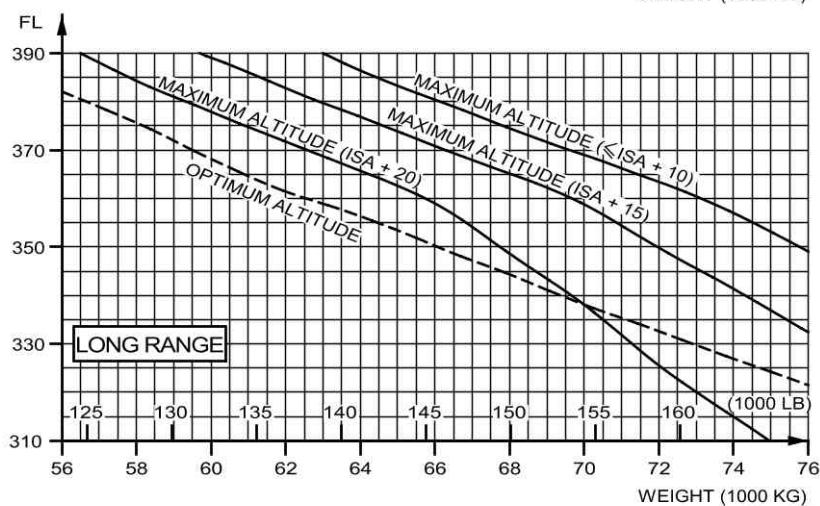
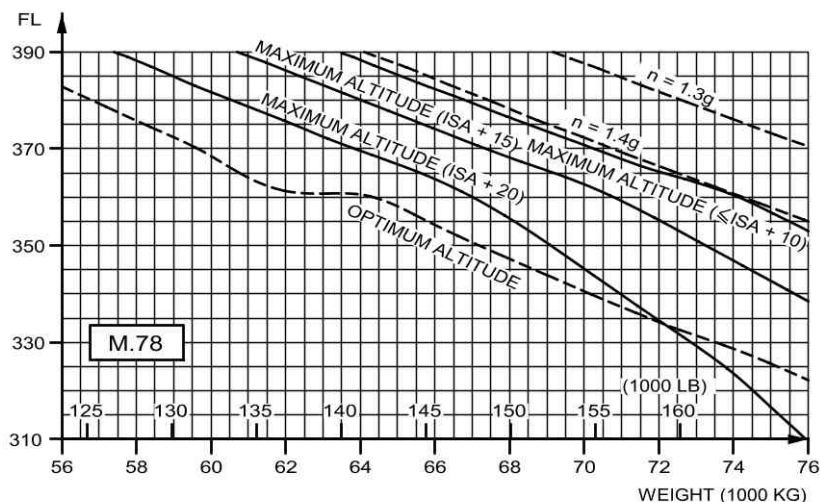
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG				ISA		FUEL CONSUMED (KG)			
PACK FLOW HI				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %				TOTAL ANTI ICE ON △FUEL = + 6 %					





## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

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## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

**ALL ENGINES**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)  TIME (H.MIN)			
AIR  DIST.  (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING ΔFUEL = - 0.4 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %			TOTAL ANTI ICE ON ΔFUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NQ-04-10-140

## COST INDEX FOR LONG RANGE CRUISE SPEED

**ALL ENGINES**

For a quick determination of the  $CI_{LRC}$ , use:

- $CI_{LRC} = 40$  kg/min in the FMGC.
- or
- $CI_{LRC} = 55$  (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									
	45				65				
	TIME	FUEL	DIST.	EPR	TIME	FUEL	DIST.	EPR	IAS (KT)
FL	(MIN)	(KG)	(NM)		(MIN)	(KG)	(NM)		
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

# QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 3 %			ΔFUEL = + 7 %			

CL-W0-04-13-140





# IN CRUISE QUICK CHECK FL 100 LONG RANGE

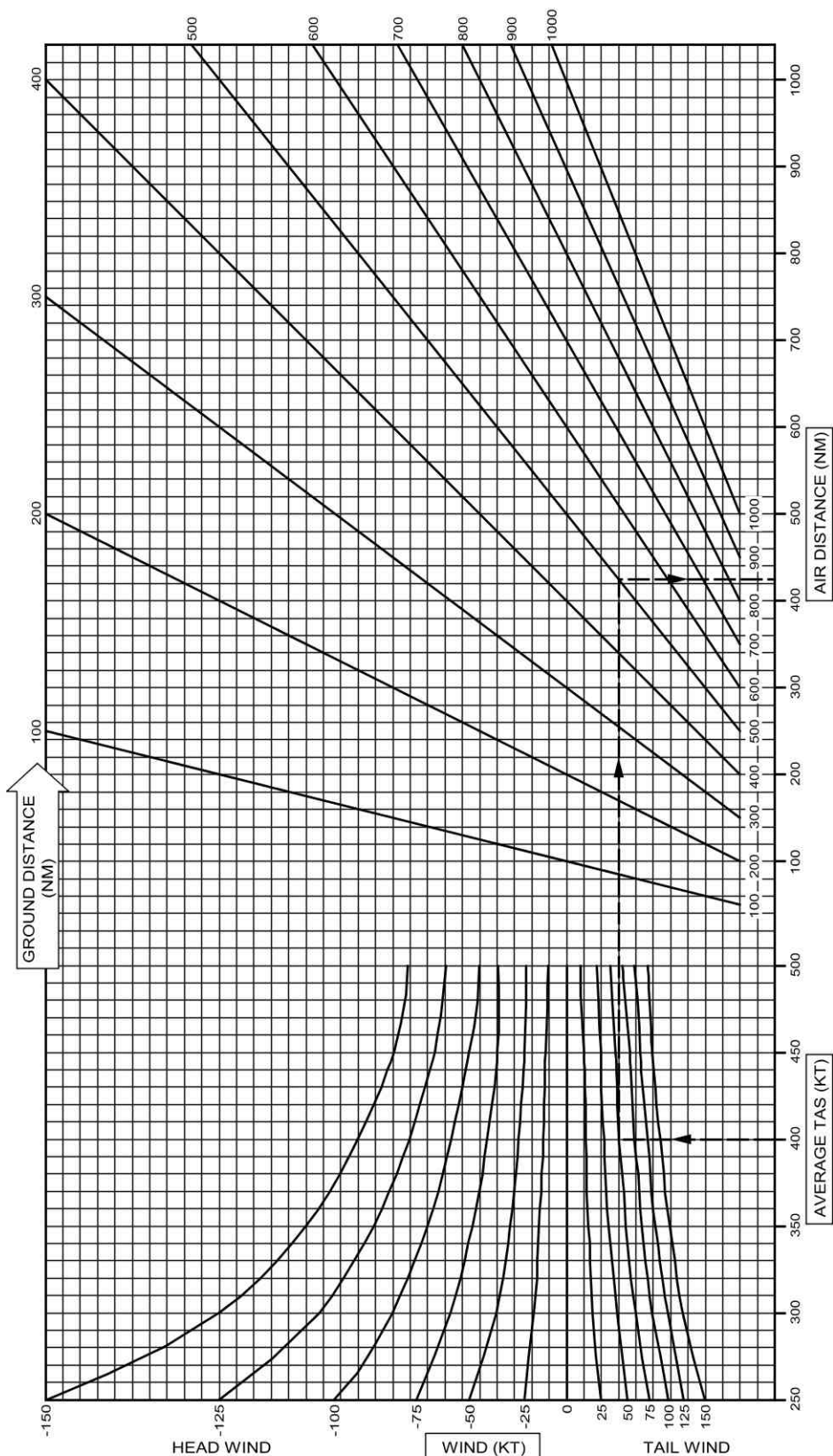
## FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING		ISA		FUEL CONSUMED (KG)			
ANTI-ICING OFF		CG = 25.0%		TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46
260	1870 1.03	1936 1.00	2004 0.99	2074 0.97	2148 0.95	2222 0.92	2277 0.90
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.98	2396 0.95	2456 0.93
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.99	2634 0.96
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.99
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35
AIR CONDITIONING OFF △FUEL = - 1.5 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 6 %		

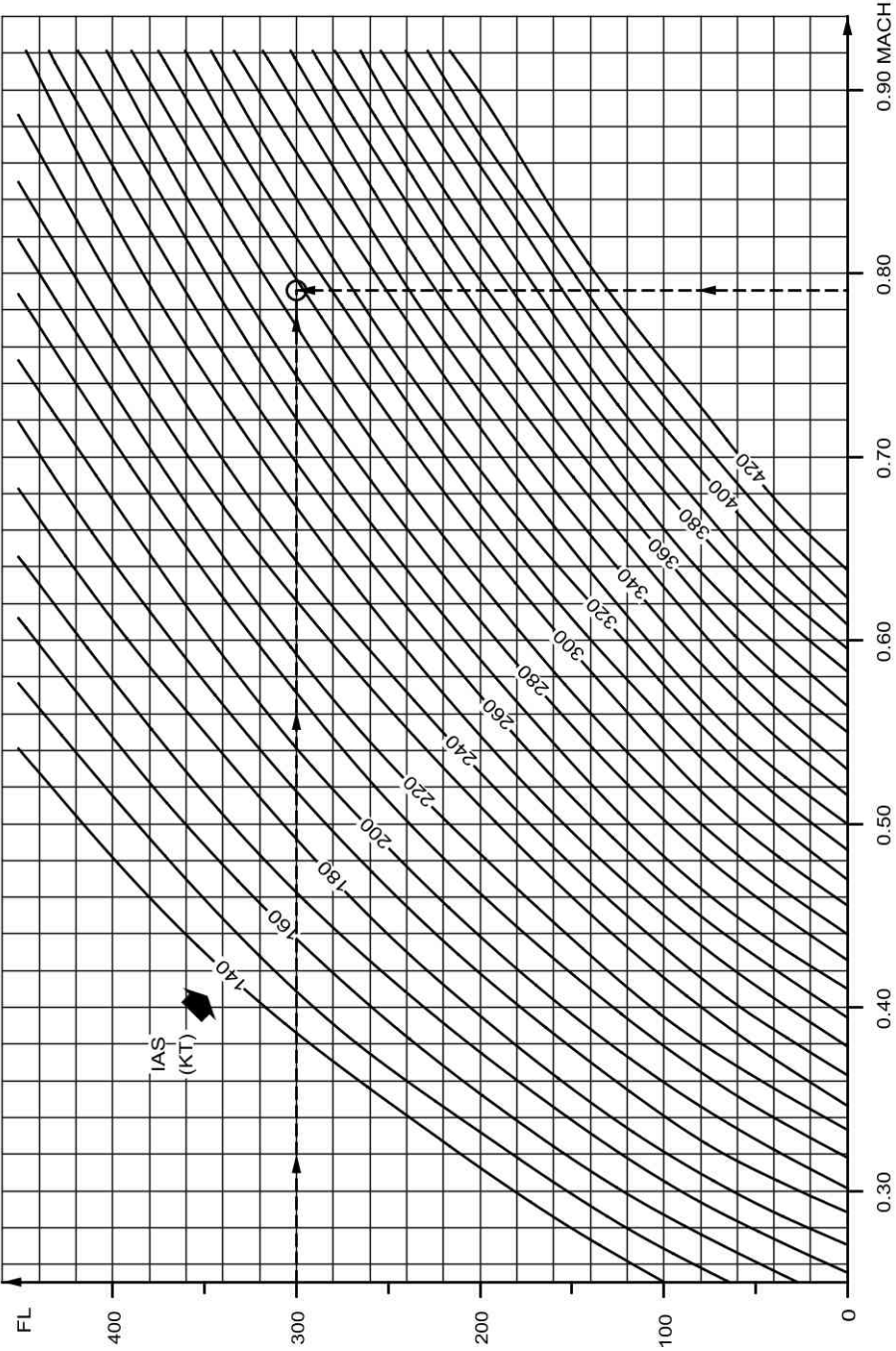
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**







## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

*Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.*

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

*Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:*

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**


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**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

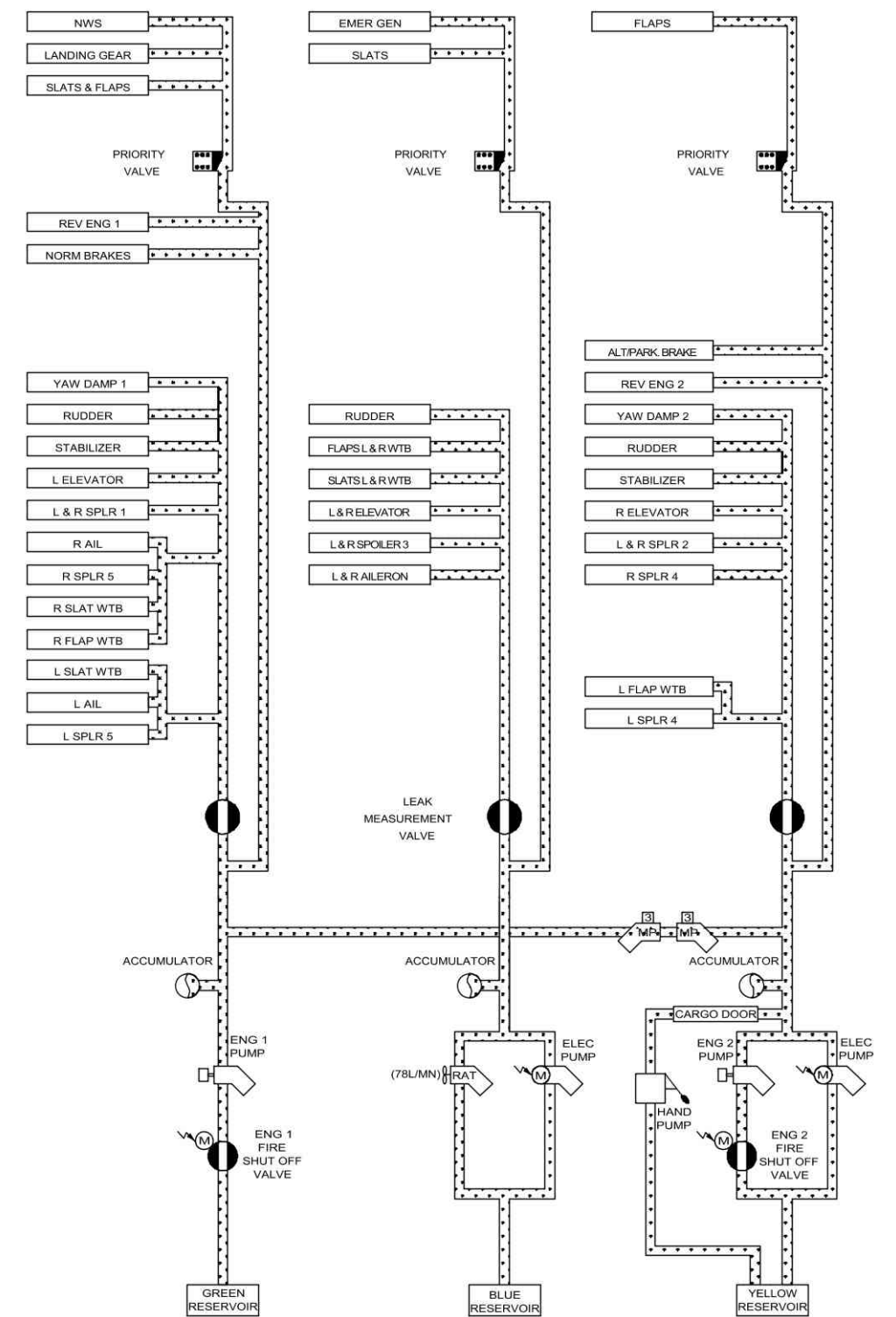
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

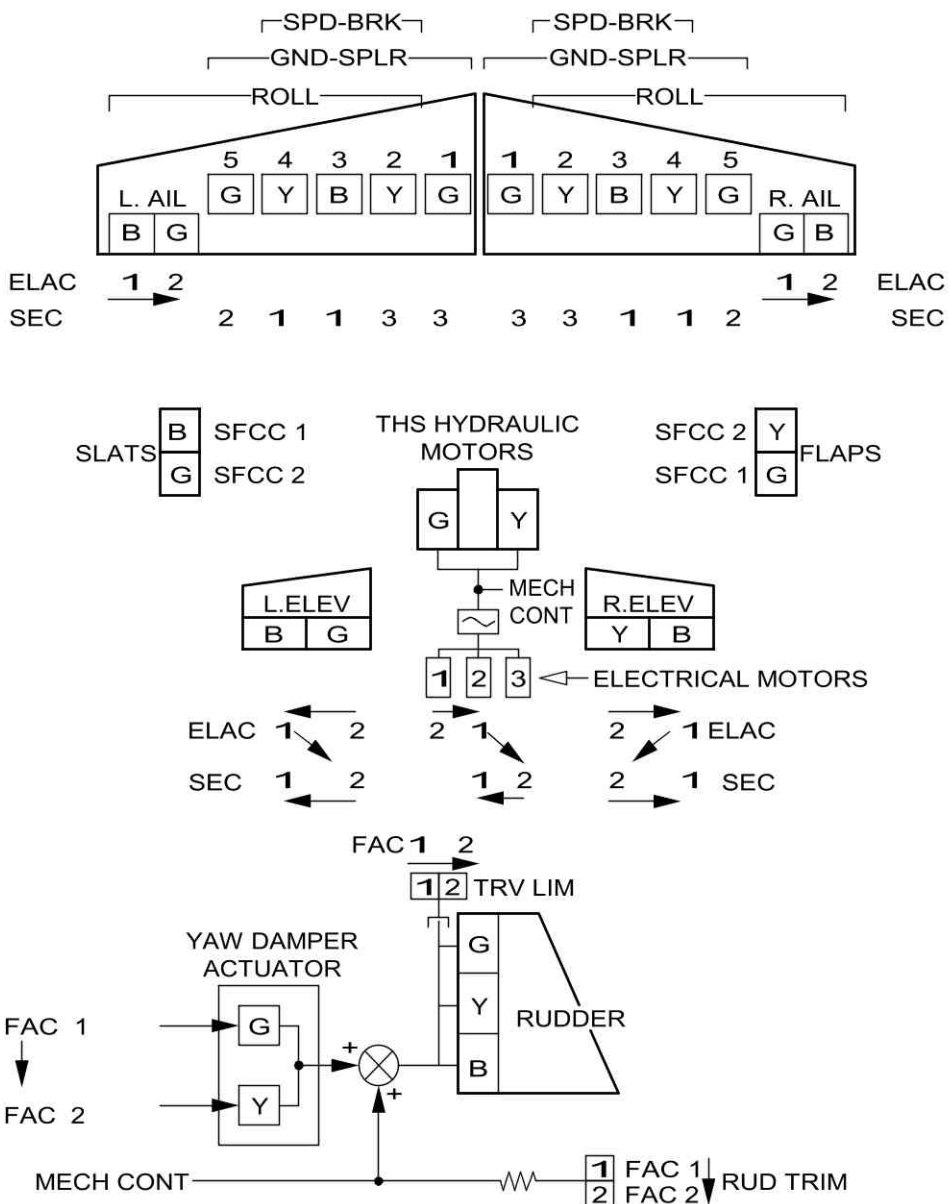
A/THR in managed speed.....USE

**HYDRAULIC ARCHITECTURE**





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHURST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
ADR/IR	2/2	2/2	3/3	
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.



# **OPERATIONS ENGINEERING BULLETINS**

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<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.01</b>

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## **OEBPROC-36 No SRS Engagement During Go Around in the Case of EPR Mode Fault**

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<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.01</b>

## **OEBPROC-38 Erroneous Radio Altimeter Height Indication**

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.00</b>
<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.01</b>

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<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.00</b>
<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.01</b>

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L/G GEAR NOT DOWNLOCKED.....	44.00
■ L/G GEAR NOT DOWNLOCKED ■.....	44.01



## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an ENG 1(2) OIL FILTER CLOG ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		11.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSM					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSM					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note:     *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		17.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSM				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSM				



## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSM				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSM				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## **OEB36 Issue 1.0**

# **NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT**

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		36.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSM					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSM					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSM				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSM				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSM				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSM				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



# AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).



## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSM				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSM				

**F/CTL SPOILER FAULT**

**ECAM ENTRY**

F/CTL SPLR FAULT

**PROCEDURE**

- If **F/CTL SPLR FAULT** is triggered  
 F/CTL S/D page.....CHECK  
*The flight crew should check the spoiler position on the F/CTL System Display page.*
- If all amber spoilers are indicated retracted:  
*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

STATUS	
<ul style="list-style-type: none"> <li>● If spoilers 3+4 affected</li> </ul>	<b>INOP SYS</b> SPLR(affected) SPD BRK (if spoilers 2+3+4 affected)
- SPD BRK.....DO NOT USE LDG DIST PROC.....APPLY	

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

F/CTLSPLR FAULT

AP..... OFF  
*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED..... GDOT+10  
*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED  
*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED..... DISREGARD

FUEL CONSUMPTION..... DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above  $V_{FE_{NEXT}}$ , the flight crew should deselect A/THR, decelerate to  $V_{FE_{NEXT}}$ , and select CONF 1 when below  $V_{FE_{NEXT}}$ . When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... $V_{REF} + 10KT$

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers.....x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>44.00</b> 30 MAR 12
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## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSM				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSM				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	BLANK
		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSN**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSN</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HSN</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HSN</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSN</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HSN</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSN</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSN</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSN</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12


<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-31	<b>MULTIPLE UNDUE ECAM ALERTS</b>	00013755.0001001	30 MAR 12
	Criteria: 31A1220, 31-1276, P8671, P9824 <b>Applicable to: B-HSN</b> <i>Impacted DU: NONE</i> <u>Reason for issue:</u> <i>This Temporary Revision is issued to give a procedure to the crew in the case of multiple suspected undue ECAM alerts.</i>			

	ABN-80	<b>Computer Reset Table</b>	NG00824	
	ABN-80	<b>Computer Reset Table - 27 - Flight Controls</b>	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSN</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	2428	HDA 0005	B-HSN	320-232


(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12


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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	27-1189 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L94 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	27-1182 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L93 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>2/6</b>
		30 MAR 12


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	Applicable to: ALL			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	Applicable to: ALL			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	Applicable to: ALL			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	Applicable to: ALL			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	Applicable to: ALL			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	Applicable to: ALL			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	Applicable to: ALL			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	Applicable to: ALL			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	Applicable to: ALL			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	Applicable to: ALL			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	Applicable to: ALL			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+)- STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	Applicable to: ALL			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	Applicable to: ALL			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	Applicable to: ALL			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	Applicable to: ALL			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	Applicable to: ALL			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	Applicable to: ALL			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	Applicable to: ALL			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P4287	31-1113 30 31-1264 04	07 APR 11	INDICATING/RECORDING SYSTEMS - FWC - DEFINE OEB REMINDER WITHIN FWC STD -E1 AND SUBSEQUENT
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	K9231		30 AUG 10	EQUIPMENT/FURNISHINGS-MISCELLANEOUS EMERGENCY EQUIPMENT-INSTALL ELT WITH RCP IN COCKPIT ON ENH. PROV.-HONEYWELL
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	Applicable to: ALL			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	Applicable to: ALL			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	P7062		30 AUG 10	OXYGEN - CREW OXYGEN - INSTALL ALTERNATIVE 115CU FT FLIGHT CREW OXYGEN CYLINDER COMPOSITE SCOTT P/N 897940-15
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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General Information.....	GEN.03

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**

DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

# USE OF SUMMARIES

## GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

## APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

## APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.



## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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<b>LOW ENERGY WARNING.....</b>	<b>22.02</b>

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<b>ELEC EMER CONFIG Summary.....</b>	<b>24.02</b>

## **ABN-25 Equipment**

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<b>■ SMOKE/FUMES/AVNCS SMOKE ■.....</b>	<b>26.02</b>

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<b>SIDESTICK/RUDDER PEDALS STIFF.....</b>	<b>27.03</b>
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**CABIN OVERPRESSURE**

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.
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## LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### ■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:

#### ● When the system has recovered:

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### ■ DESCENT (IF TIME PERMITS) :

#### ● When the system has recovered:

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		



**ELEC EMER CONFIG SYS REMAINING**

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



Continued from the previous page

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
PNEU	ISIS	Norm	Norm	Norm
	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
APU	X BLEED (MAN CTL)	Norm	Inop	Inop
	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
PWR PLT	FUEL PUMP	Norm	Norm	Norm
	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
MISC	HP FUEL VALVE closure	Norm	Norm	Norm
	MECH HORN	Norm	Norm	Norm

(a)

Restored, when speed is below 100 kt.

(b)

Crew oxygen valve inoperative.

(c)

Lost, when speed is below 50 kt.

(d)

Lost 30 s after last engine shutdown.

(e)


IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f)

For APU start only.

(g)

Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
<b>DRY Runway</b>	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
 In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK  
*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.  
 The system may be recovered by performing the following steps:

Cockpit door..... OPEN  
 COCKPIT DOOR sw..... SET to UNLOCK


After 30 s:  
 COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT.....

ON
- If fuel vapors:**

CAB FANS.....

ON

PACK 1+2.....

OFF
- If no fuel vapors:**

CAB FANS.....

OFF

PACK FLOW.....

HI
- LDG ELEV.....

10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude).....

INITIATE
- ATC.....

NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC.....

CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*
- At FL 100 OR MEA:**

APU MASTER SW (if in ELEC EMER CONFIG)...

ON

PACK 1+2.....

OFF

MODE SEL.....

MAN

MAN V/S CTL.....

FULL UP

RAM AIR.....

ON

APU MASTER SW.....

OFF
- If smoke persists, open CKPT window:**

MAX SPEED.....

200 KT

COCKPIT DOOR.....

OPEN

HEADSETS.....

ON

PNF COCKPIT WINDOW.....

OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMERG
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT.....ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATE:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL.....CONSIDER  
 ELEC EMER CONFIG.....CONSIDER  
*Refer to the end of the procedure to Set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING.....CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

- **IF AIR COND SMOKE SUSPECTED:**  
 APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 PACK 1..... OFF  
 ● **If smoke continues:**  
 PACK 1..... ON  
 PACK 2..... OFF  
 ● **If smoke still continues:**  
 PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ● **IF CAB EQUIPMENT SMOKE SUSPECTED:**  
 ● **If smoke continues:**  
 EMER EXIT LIGHT..... ON  
 COMMERCIAL..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE  
 ● **If smoke still continues or if faulty  
equipment confirmed isolated:**  
 COMMERCIAL..... NORM  
 SMOKE/FUMES REMOVAL..... CONSIDER





## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

#### ● WHEN EMER GEN AVAIL:

APU GEN ..... OFF  
GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

#### ● JUST BEFORE L/G EXTENSION:

GEN 2..... ON  
EMER ELEC GEN 1LINE..... ON

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


- Note:
- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
  - In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED


Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
Slats					
S = 0	NO LIMITATION	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1	230 kt				
S = 1					
1 < S ≤ 3	200 kt		200 kt	185 kt	177 kt
S > 3	177 kt		177 kt	177 kt	177 kt

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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<b>SIDESTICK/RUDDER PEDALS STIFF</b>		
<p>Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:</p> <ul style="list-style-type: none"><li>- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or</li><li>- One sidestick and the rudder pedals at the same time.</li></ul> <p>The piloting technique remains the same: The aircraft remains responsive. However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.</p> <p>AP DISENGAGEMENT.....CONFIRM</p> <p>CONSIDER TRANSFERRING CONTROL TO PNF</p> <p>● <b>FOR DECRAB, ROLLOUT, OR ENGINE FAILURE</b></p> <p>BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL</p>		



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

# STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

**● IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

**● IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP

FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON

- **On the lighter side and in the center tank:**  
FUEL PUMPS.....OFF
- **When fuel is balanced:**  
FUEL PUMPS (WING + CTR)..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

FUEL X FEED..... USE AS RQRD


*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.





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**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*
- **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**  
 CTR TK PUMP 1+2..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147


APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75								
<b>CONTA runway (CONF 3)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147


APPROACH	
CAT 2 INOP	
SLATS SLOW / FLAPS JAMMED	
GPWS FLAP MODE.....	OFF
● For Flaps extension:	
SPD SEL.....	VFE NEXT - 5KT
When in landing CONF : DECELERATE TO CALCULATED VAPP	
Stabilize at VAPP before L/G down, to be trimmed for approach.	
L/G GRAVITY EXTENSION	

LANDING											
<b>FLARE:</b> PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law											
<b>SPOILERS:</b> Only 1 per wing											
<b>NO REVERSER</b>											
<b>BRAKING:</b> BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI											
<b>NO NOSEWHEEL STEERING</b>											

GO-AROUND											
NO GEAR RETRACTION. Increased fuel consumption											
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt											
<b>● For diversion:</b> <b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds <b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt											

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10								
CORRECTIONS	+ 1 000 ft above SL				+ 10 kt tailwind				
DRY runway	+ 3 %				+ 18 %				


The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or INVALID DATA message),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, ECAM DUs or MCDU 1 is(are) affected.

GEN 1 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 1 ..... ON

#### ■ If DUs stop flashing:

GEN 1 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 2 ..... ON

#### ■ If DUs stop flashing:

GEN 2 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ DU is blank (with or without a large letter “F” in amber), or the display is distorted:

DU (affected) ..... AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected) ..... USE

*Transfer SD to the F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected) ..... USE

### ■ INVALID DISPLAY UNIT message is displayed:

This may be caused by a DU failure.

FOR AUTOMATIC DU RECOVERY ..... WAIT MORE THAN 40 s



DISPLAY UNIT FAILURE (Cont'd)

- **IF DU IS AUTOMATICALLY RECOVERED:**  
 No crew action is required.
  
- **IF DU IS NOT RECOVERED:**  
 Non-recovered DU..... AS RQRD  
*The DU can be switched off.*
  
- **INVALID DATA message appears (not on all DUs):**  
 EIS DMC SWITCHING..... AS RQRD
  
- **If unsuccessful:**  
 DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
  
- **INVALID DATA message appears on all DUs:**  
 The autopilot, autothrust and MCDU navigation data are still available, and may be used.  
 FOR AUTOMATIC DUs RECOVERY ..... WAIT MORE THAN 40 s
  
- **IF ALL DUs ARE AUTOMATICALLY RECOVERED:**  
 No crew action is required.
  
- **IF ONE OR MORE DUs ARE NOT RECOVERED:**  
 Non-recovered DUs..... OFF FOR 40 s  
 Non-recovered DUs..... BACK ON sequentially
  - **If the initial failure re-occurs (INVALID DATA message appears on all DUs), when switching a given DU back ON:**  
 Apply the entire procedure again, from the beginning.  
 Leave this specific DU permanently OFF.
  
- **INVERSION OF THE EWD AND THE SD:**  
 ECAM UPPER DISPLAY ..... OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

MULTIPLE UNDUE ECAM ALERTS

- In the case of multiple undue ECAM alerts concerning :
- ENG 1(2) N1(N2) (EGT) (FF) OVER LIMIT or
  - ENG 1(2) N1(N2) (EGT) (EPR) (FF) DISCREPANCY or,
  - NAV ATT(ALT) (HDG) DISCREPANCY or,
  - NAV FM/GPS POS DISAGREE or,
  - FUEL F.USED/FOB DISAGREE or,
  - MINIMUM or HUNDRED ABOVE callouts,

possibly associated with EFIS red flags, apply the below procedure :

AFFECTED PARAMETERS..... CROSSCHECK

Crosscheck the affected parameters on the E/WD, PFD, ND or on the related SD page to confirm that the alerts are spurious.

- **If it is confirmed that the ECAM alerts are spurious, identify the faulty DMC :**  
EIS DMC SWITCH.....CAPT 3  
*DMC 3 replaces DMC 1. If the undue alerts stop, DMC 1 is the faulty DMC.*
- **If unsuccessful :**  
EIS DMC SWITCH.....F/O 3  
*DMC 3 replaces DMC 2. If the undue alerts stop, DMC 2 is the faulty DMC.*

LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

## LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <b>L/G GEAR NOT DOWN</b> ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOMELT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.







## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE


- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

#### **F/CTL ALTN LAW**

#### **(PROT LOST)**

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

#### **APPR PROC:**

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### ● **FOR L/G GRVTY EXTN (not on the ECAM):**

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### **INOP SYS**

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### **Other INOP SYS**

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT




ADR 1 + 2 + 3 FAULT (Cont'd)

- DURING FINAL APPR  
V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*

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## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

- The following procedure is not displayed on the ECAM:
- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.
  - **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.
    - **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
    - **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
  - **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.

During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

■ **MCDU INITIALIZATION:**

- DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*
- IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*
- A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*

■ **CDU INITIALIZATION:**

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

■ **If “H” is written on the “5” key:**

- H KEY.....PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*
- A/C HEADING..... ENTER

■ **If “H” is not written on the “5” key:**

- A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG–ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.





## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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**AFFECTED ADR IDENTIFICATION:**

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s)..... OFF

REMAINING AIR DATA..... CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR..... KEEP ON

*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs..... OFF

*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF..... USE FLAP 3

APP SPD..... VLS +10

LDG DIST PROC..... APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST..... CLB

FLAPS..... RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)* )

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	250 kt	10.0/CLB	10.5/CLB	11.5/CLB
FL 50 - FL 100		9.0/CLB	9.5/CLB	10.0/CLB
FL 100 - FL 150		8.0/CLB	8.5/CLB	8.5/CLB
FL 150 - FL 200		7.0/CLB	7.0/CLB	7.0/CLB
FL 200 - FL 250	275 kt	5.0/CLB	5.0/CLB	5.0/CLB
FL 250 - FL 320		4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200-FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 67 t	67 t -57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320-FL 200	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE
FL 200 - FL 100	250 kt	1.5/IDLE	0.5/IDLE	-0.5/IDLE
Below FL 100	250 kt	1.0/IDLE	0.0/IDLE	-1.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.5/IDLE	2.5/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 67 t	67 t - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.5/55.7	5.5/51.5	6.0/47.3
1	S	7.5/58.2	7.5/54.0	7.5/49.0
1+F <sup>(1)</sup>	S	4.5/60.2	4.5/56.1	4.5/51.2
2	F	9.0/61.7	9.0/57.3	9.0/52.8



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	7.5/67.2	7.5/62.7	7.5/57.9

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

### FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 67 t	67 t - 55 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	4.5/48.0	4.5/44.4	4.5/41.4


**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :  
 X BLEED..... CHECK OPEN  
 DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
 APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
 WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
 APU BLEED..... ON  
 MAX FL200  
 AVOID ICING CONDITIONS
  - IF ICE ACCRETION  
 APPR SPD.....VLS + 10 KT  
 LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*



ENG DUAL FAILURE - FUEL REMAINING

As long as none of the engines recover, the flight crew should apply this paper procedure and then, if time permits, clear ECAM alerts and check the ECAM. STATUS page.

**LAND ASAP**

ENG MODE SEL.....IGN  
 THRUST LEVERS.....IDLE  
 OPTIMUM RELIGHT SPD.....280 KT

*Note:* In the case of an “ENG DUAL FAILURE” during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.

In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).

LANDING STRATEGY.....DETERMINE  
 Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.

EMER ELEC PWR.....MAN ON  
 VHF1/HF1 /ATC1.....USE  
 ATC.....NOTIFY  
 FAC 1.....OFF THEN ON  
 Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.

- **IF NO RELIGHT AFTER 30 SEC:**  
 ENG MASTERS.....OFF 30 S/ON  
 Unassisted start attempts can be repeated until successful, or until APU bleed is available.
- **IF UNSUCCESSFUL:**  
 CREW OXY MASKS (Above FL 100).....ON
  - **WHEN BELOW FL 250**  
 APU (IF AVAIL).....START
  - **WHEN BELOW FL 200**  
 WING ANTI ICE.....OFF  
 APU BLEED.....ON  
 ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*


**ENG DUAL FAILURE - NO FUEL REMAINING**

The flight crew should apply this paper procedure and then, if time permits, clear ECAM warnings and check the ECAM STATUS page.

THRUST LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
*Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.*  
 OPTIMUM SPEED.....220 KT/GREEN DOT  
*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*  
 EMER ELEC POWER (if EMER GEN not in line).....MAN ON  
 VHF1/HF1  /ATC1.....USE  
 ATC.....NOTIFY  
 CREW OXY MASKS (Above FL 100).....ON  
 CABIN AND COCKPIT.....PREPARE  
 SIGNS.....ON  
 COMMERCIAL.....OFF  
 USE RUDDER WITH CARE  
 ● **WHEN BELOW FL 150**  
   RAM AIR..... ON

**COMMON ACTIONS FOR THE APPROACH**

**APPROACH PREPARATION**

*Note:*    *Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).*

BARO..... SET  
 CREW MASKS/OXY SUPPLY (below FL 100).....OFF

**IF FORCED LANDING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
 MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE

*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**  
 GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
 L/G lever..... DOWN  
 APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*
- GND SPLR..... ARM
- MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**


BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**

ENG MASTERS..... OFF

BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**  
 PARKING BRK.....ON  
 ATC.....NOTIFY
  - **If Evacuation required :**  
 EVACUATION.....INITIATE  
 ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**  
 CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
 MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF


AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

## ENG RELIGHT (IN FLIGHT)

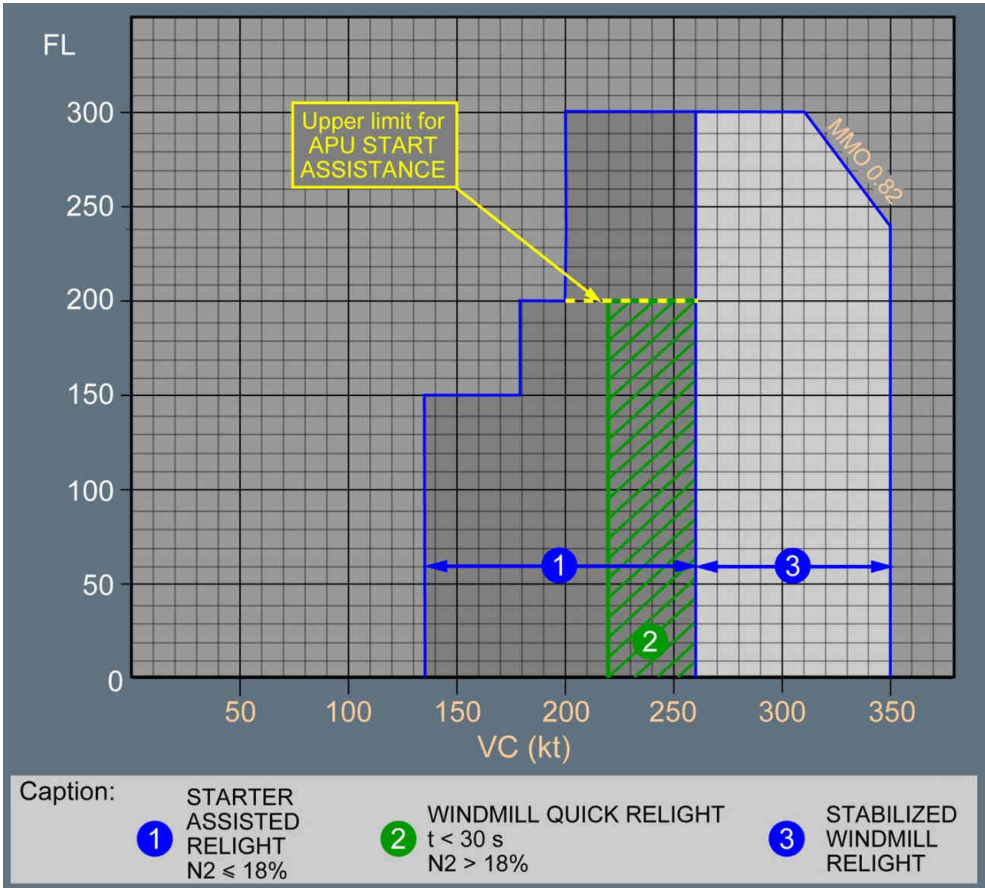
- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.

Engine light up should be achieved within 30 s after fuel flow increases.

- **When idle is reached (AVAIL indication pulses in green) :**
- |                                                                                                       |             |
|-------------------------------------------------------------------------------------------------------|-------------|
| ENG MODE SEL.....                                                                                     | NORM        |
| TCAS MODE SEL  ..... | check TA/RA |
- Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.
- |                   |         |
|-------------------|---------|
| Affected SYS..... | RESTORE |
|-------------------|---------|

- **If no relight :**
- |                            |     |
|----------------------------|-----|
| ENG MASTER (affected)..... | OFF |
|----------------------------|-----|
- Wait 30 s before attempting a new start (to drain the engine).







## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
---------	---------------------------------------------------------------------------------------------------------------------------------------------

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

- When burning has stopped :  
MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### **COCKPIT PROCEDURES**

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

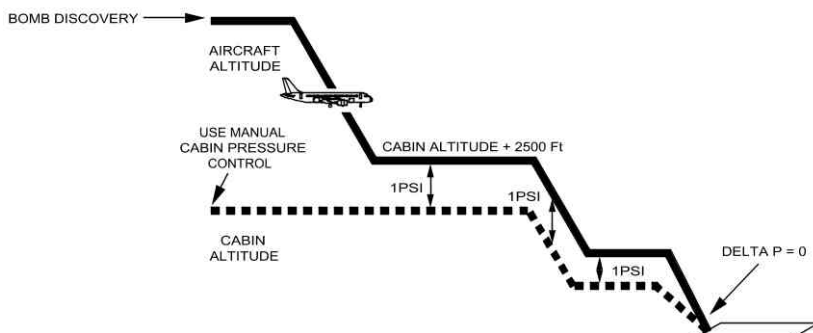
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :


- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE
<i>Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.</i>	
NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN
<i>Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.</i>	
DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN





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BOMB ON BOARD (Cont'd)

- When at CAB ALT+ 2 500 ft:  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - When the bomb is secured at the LRBL or cannot be moved:  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- For any other steps of descent:  
1 PSI DELTA P..... MAINTAIN
- During approach:  
CABIN PRESS MODE SEL..... AUTO
- When aircraft on ground and stopped in a remote area (if possible) :
  - If evacuation required:  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - If evacuation not required:  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:

WARNING

Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.

WARNING


Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.

CAUTION

The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*  
BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*  
PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*

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BOMB ON BOARD (Cont'd)

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

*The cabin crews must command passengers to switch off all portable electronic devices.*

BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

● If the bomb can be moved:

RH AFT CABIN DOOR SLIDE..... DISARM

LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

CAUTION

DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

BOMB INDICATION LINE..... POSITION

Note:

*A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

BOMB..... MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

CAUTION

Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.





**BOMB ON BOARD (Cont'd)**

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE  
*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

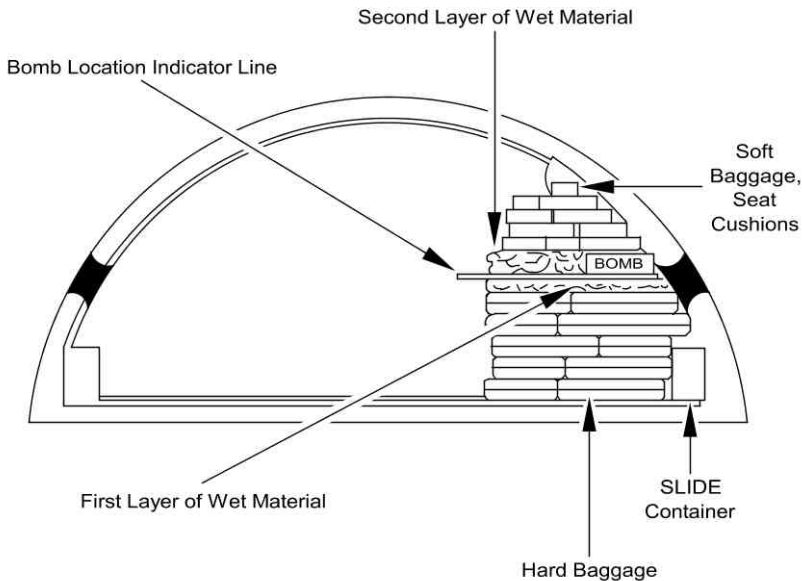
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

LRBL STACK




PASSENGERS.....MOVE/ADVISE  
*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW  
*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".		
Use all available airport facilities to disembark without delay.		



## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### PREPARATION

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### APPROACH

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### AT 2 000 FT AGL

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### AFTER DITCHING

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT.....ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1).....NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE



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**FORCED LANDING (Cont'd)**

ELT..... CHECK EMITTING  
*If not, switch on the transmitter.*

■ **If Evacuation not required:**  
 CABIN CREW and PASSENGERS (PA)..... NOTIFY

EMER DESCENT

**IMMEDIATE ACTION**

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


**WHEN DESCENT ESTABLISHED**

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

<b>CAUTION</b>	<i>Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.</i>
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*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note:     *The recommendation is to descend with the autopilot engaged.  
                  Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN  
 ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

● **IF CAB ALT > 14 000 ft:**

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note:     *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
- If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.

In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.

Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown

REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								

# STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**  
*This will reduce angle of attack*

Note:     *In case of lack of pitch down authority, reducing thrust may be necessary.*

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note:     *In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

**SPEEDBRAKES..... CHECK RETRACTED**  
**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note:     *If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

# STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**  
**BANK..... WINGS LEVEL**

Note:     *When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.*



TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- If the aircraft enters a volcanic ash cloud:
 

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
PACK FLOW.....	HI

Note:     If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

If airspeed is unreliable or lost,Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

Note:     If all engines flame out and speed indications are lost,Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note:     If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

Due to the increased noise level, pay particular attention to visual warnings.



## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.





## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*

Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

WINDSHIELD/WINDOW ARCING

Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)



## WINDSHIELD/WINDOW CRACKED

**DIAGNOSIS OF INNER PLY.....PERFORM**

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

**MAX FL.....230/MEA**

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

**CAB PRESS MODE SEL.....MAN**

**MAN V/S CTL.....AS RQRD**

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


**CAB PRESS MODE SEL.....AUTO**

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

**CAB PRESS MODE SEL.....MAN**

**MAN V/S CTL.....FULL UP**

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>
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SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
OXY	Cockpit oxygen bottle pressure < 600 PSI.	If mask is not being used, check if it is correctly stowed.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).





## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION

$$VAPP = VREF + \Delta VREF + APPR COR$$

=

VREF												
Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78	
VREF (KT) = VLS CONF FULL	CG < 25%	108	113	118	123	127	131	136	140	144	148	149
	CG ≥ 25%	106	111	116	121	125	129	134	138	142	146	147

+

$\Delta VREF^{(1)}$

+

APPRoach CORrection		
if $\Delta VREF \leq 10$ kt	if $10 \text{ kt} < \Delta VREF < 20$ kt	if $\Delta VREF \geq 20$ kt
APPR COR is the Highest of		
5 kt * if A/THR ON and / or in case of ice accretion**	1/3 Headwind Max = 15 kt	APPR COR = 1/3 Headwind Max = 10 kt
APPR COR + $\Delta VREF$ limited to 20 kt		APPR COR = 0 kt

\* Multiply the landing distance by an additional factor of 1.1

\*\* In CONF3, add another 5 knot speed increment and multiply the landing distance by an additional factor of 1.2 (instead of 1.1)

=

$$VAPP = VREF + \Delta VREF + APPR COR$$

TO BE INSERTED IN THE MCDU PERF APPR PAGE

(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:


Failure : ALTN LAW  
Flight Conditions : Autothrust ON, ice accretion  
Landing Configuration : CONF 3  
Headwind : 12 kt  
Landing Weight/CG : 48 t/25 %  
VREF determined from the landing weight : 116 kt  
VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt}/3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136$  kt

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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors “WITHOUT REV”** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors “WITH REV”** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note: *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:


FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
	3	10			1.40×1.90×1.1=3.00
RESULT	3	10			

$VREF = 131\text{ kt.}$  Therefore  $VAPP = 131 + 10 + 5 = 146\text{ kt.}$

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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



*Continued from the previous page*


DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	if there is ice accretion				
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
NAV	IR 1+2+3 FAULT	3	10	1.85	1.85
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.40*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1  3	55 (APPR) 40 (THRESHOLD) 10	2.00*  1.35*	1.90*  1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*





*Continued from the previous page*


CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
NAV	IR 1+2+3 FAULT	3	10	1.45	1.45
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.35*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.


The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:



- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>				
ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset	
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B Y 17 on 122VU</li><li>- Wait 1 s before pushing the C/B.</li></ul>	
22	AUTO FLT FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul>	
22	AUTO FLT FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s</li><li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"><li>- RE-ENTER the barometer altimeter setting value, if necessary.</li></ul>	




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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<b>On ground, or in flight:</b> Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT & PURS CAPT sw to the CAPT only position. Wait for 3 s. <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G02 on 49VU, M05 and N11 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs in the following order: N11, M05, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<b>On ground, or in flight:</b> The flight crew must reset all the RMPs one after the other via the RMP control panel: <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
24	GPU cannot be connected to the aircraft	GAPCU	<b>On ground only:</b> The GPU cannot be connected to the electrical network of the aircraft (AVAIL light is OFF): <ul style="list-style-type: none"> <li>• If at least one power source (IDG 1 or 2, APU GEN or batteries) is connected to the electrical network of the aircraft.               <ul style="list-style-type: none"> <li>- Reset the EXT PWR pb on 35VU (Press and release)</li> </ul> </li> <li>• If no power source is connected to the electrical network of the aircraft.               <ul style="list-style-type: none"> <li>- Set the BAT 1 pb-sw and BAT 2 pb-sw to AUTO.</li> </ul> </li> </ul>
26	SMOKE LAV + CRG DET FAULT	SDCU	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<div>On ground, or in flight</div> <div><div>- Set ELAC 1(2) pb to OFF</div><div>- Wait 3 s,</div><div>- Set ELAC 1(2) pb to ON</div></div> <div><div>CAUTION</div><div>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</div></div> <div>Note: If both ELACs are failed, reset one ELAC after the other.</div>
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<div><div>WARNING</div><div>Do not reset more than one computer at a time.</div></div> <div>Note: If a reset is performed, the flight crew must then perform a flight controls check.</div>
	ELAC or SEC malfunction	ELAC or SEC	<div><div>WARNING</div><div><div>Do not reset more than one computer at a time.</div><div><div>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</div></div></div><div><div>Note:</div><div><div>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</div><div>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</div></div></div></div>
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<div>On ground, or in flight:</div> <div><div>- Pull the 3 C/B:</div><div><div>• Channel 1 (A13 on 49VU)</div><div>• Channel 2 (M27 on 121VU)</div><div>• Channel 1 and 2 (L26 on 121VU)</div></div><div>- Wait 5 s, before pushing the 3 C/B.</div></div> <div>Note: The fuel quantity indication will be re-established within 1 min.</div> <div><div>CAUTION</div><div><div>The FUEL AUTO FEED FAULT caution will be lost for the remainder of the flight.</div><div>In flight:</div><div><div>- If center tank is not empty, while one inner tank contains less than 5 000 kg (11 000 lb) of fuel:</div><div><div>• FUEL MODE SEL (MAN)</div></div><div>- When center tank is empty:</div><div><div>• CTR TK PUMP 1 and 2 (OFF)</div><div>• FUEL MODE SEL (MAN)</div></div></div></div></div>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>








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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><b>Note:</b> After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><b>Note:</b> After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><b>Note:</b> After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1: <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2: <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<b><u>On ground only:</u></b> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
	ISIS malfunction	ISIS	<b><u>On ground only:</u></b> With aircraft not moving: <ul style="list-style-type: none"> <li>- Pull C/B F12 on 49VU,</li> <li>- Wait 5 s, then push the C/B,</li> <li>- Normal operation is expected after approximately 2 min.</li> </ul> <p><i><b>Note:</b> In the case of small aircraft motion during the C/B reset (refueling, cargo loading conditions, etc.), the ATT red flag may appear on the ISIS. In this case, press the RST P/B for 2 s, and wait 2 min to recover normal operation.</i></p>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<b><u>On ground, or in flight:</u></b> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus. <p><b><u>On ground, or in flight:</u></b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## **RNAV (GNSS) / RNAV (RNP) APPROACH**

### ● **APPROACH PREPARATION**

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● **APPROACH GUIDANCE**

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● **AFTER COMMENCING APPROACH: NAVIGATION ALERTS**

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

● **TAKEOFF**

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

● **MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING**

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note:     The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

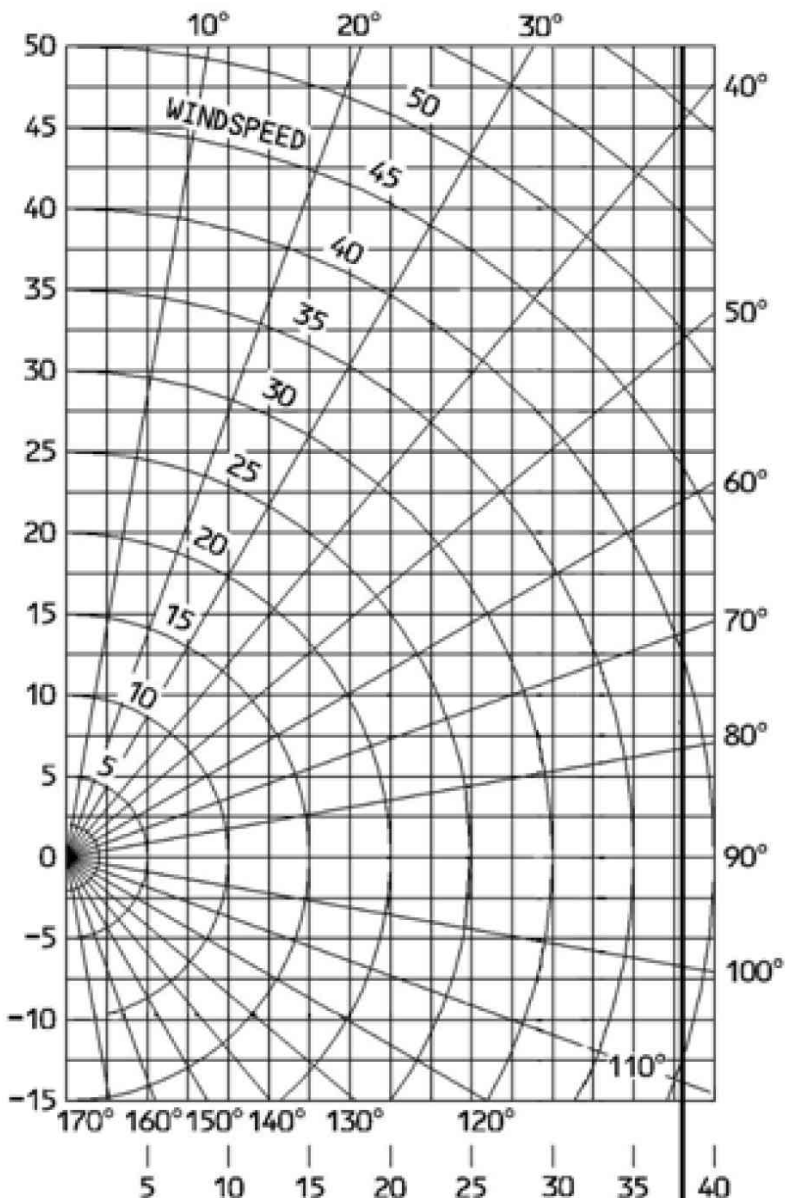
- CORRECTIONS TO MSA
  
- CORRECTIONS TO ALTITUDES BELOW MSA

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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02	
			S ≥ 1	03	NAV	IR 1+2+3 FAULT		01
	1 ≤ FLAPS < 2	S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02		
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	03	
	2 ≤ FLAPS < 3	S < 1	06	BLEED			DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion	
			S ≥ 1		07			
	FLAP = 3	S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	09			REV UNLOCK with buffet (CONF 3)		02
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
		FLAP > 3	S < 1	11				
			1 ≤ S ≤ 3	12				
			S > 3	13				
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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SPEEDS

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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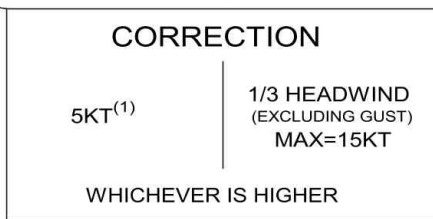
## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152

+



=

**VAPP**

$$V_{APP}^{(2)} = \text{MAX}(VLS + 5Kt^{(1)}; VLS + W_{IND} \text{ CORR})$$

1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %	+16 %	+24 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+3 %
2 reversers operative	-5 %	-12 %	-15 %	-14 %	-12 %	-27 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 × 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 × 1.06 × 1.08 = 1 020 m.

## LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

*Note:*    - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

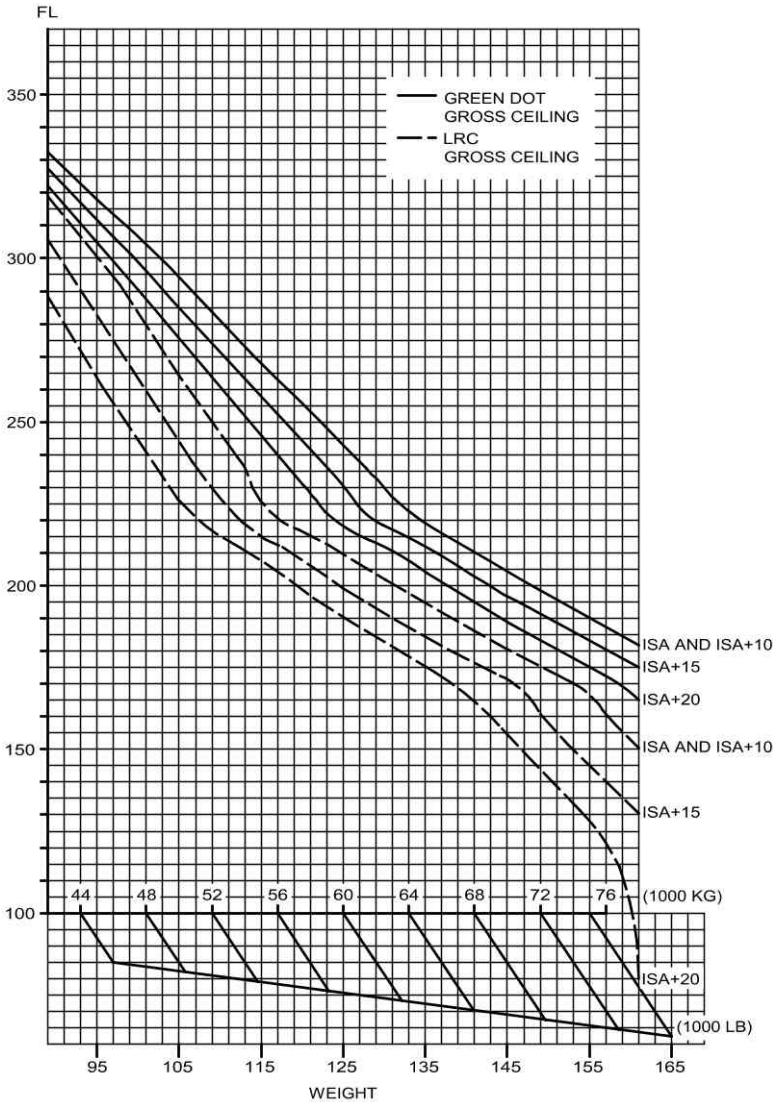
- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).



CEILINGS

ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT										
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)		
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)		
ANTI ICE OFF				LEVEL OFF (FT)						
INIT. GW	INITIAL FLIGHT LEVEL									
(1000KG)	250	290	310	330	350	370	390			
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200			
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300			
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200			
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200			
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600			
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100			
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800			
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400			
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100			
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600			
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000				
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400				
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800				
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200				
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600					
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON				
FUEL		+ 14 %				+ 28 %				
TIME		+ 13 %				+ 26 %				
DISTANCE		+ 12 %				+ 23 %				
LEVEL OFF		- 700 ft				- 1800 ft				

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b>
		30 MAR 12

## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT								
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)		MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250		
50	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584		
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241		
52	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594		
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246		
54	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602		
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249		
56	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600		
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248		
58	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585		
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242		
60	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562		
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232		
62	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570			
	2434 285	2287 272	2225 266	2248 268	2055 246			
64	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544			
	2454 284	2382 279	2317 272	2272 267	2037 234			
66	1.243 .513	1.322 .556	1.397 .591	1.421 .585				
	2476 284	2432 281	2399 277	2264 263				
68	1.247 .512	1.330 .558	1.412 .599	1.426 .570				
	2499 283	2472 282	2473 280	2253 256				
70	1.254 .514	1.338 .560	1.426 .604	1.436 .543				
	2550 285	2516 283	2537 283	2232 243				
72	1.262 .517	1.351 .567	1.428 .598					
	2604 287	2592 286	2533 280					
74	1.270 .521	1.365 .575	1.432 .587					
	2666 289	2673 290	2523 274					
76	1.290 .539	1.381 .585	1.438 .571					
	2805 299	2767 296	2509 267					
78	1.308 .554	1.395 .593	1.450 .537					
	2927 307	2850 300	2478 250					
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %				

# IN CRUISE QUICK CHECK LONG RANGE

**ONE ENGINE OUT**

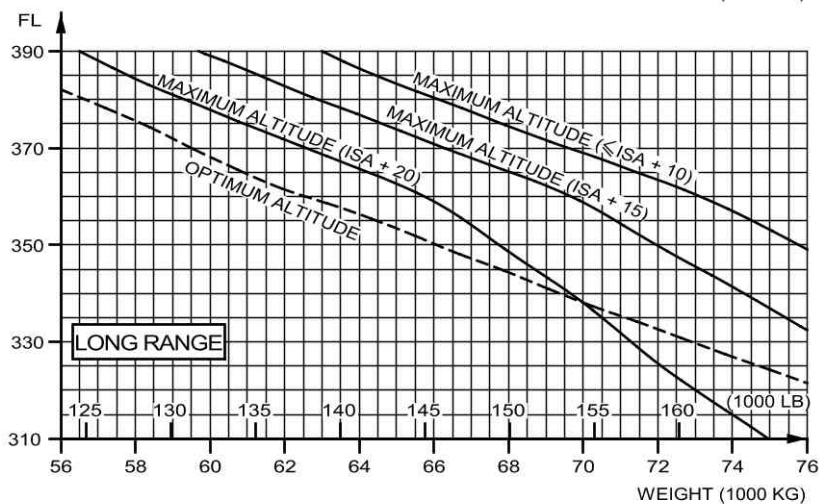
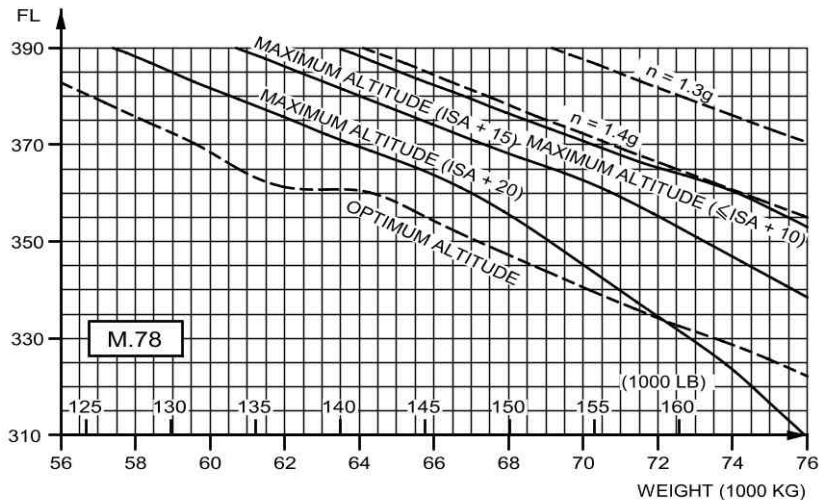
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG PACK FLOW HI ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
						TIME (H.MIN)			
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %				TOTAL ANTI ICE ON △FUEL = + 6 %					





## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
≤ ISA + 10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA + 15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA + 20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-AEO</b> <b>2/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

### ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
							TIME (H.MIN)		
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	290	310	330	350	370	390	(KG/1000KG)		
	FL290	FL330	FL370				FL290	FL330	FL370
	FL310	FL350	FL390				FL310	FL350	FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING ΔFUEL = - 0.4 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %			TOTAL ANTI ICE ON ΔFUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NQ-04-10-140

## COST INDEX FOR LONG RANGE CRUISE SPEED

### ALL ENGINES

For a quick determination of the  $CI_{LRC}$ , use:

- $CI_{LRC} = 40$  kg/min in the FMGC.
- or
- $CI_{LRC} = 55$  (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									IAS (KT)
	45				65				
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR DIST. (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 3 %			ΔFUEL = + 7 %			

CL-W0-04-13-140



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# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

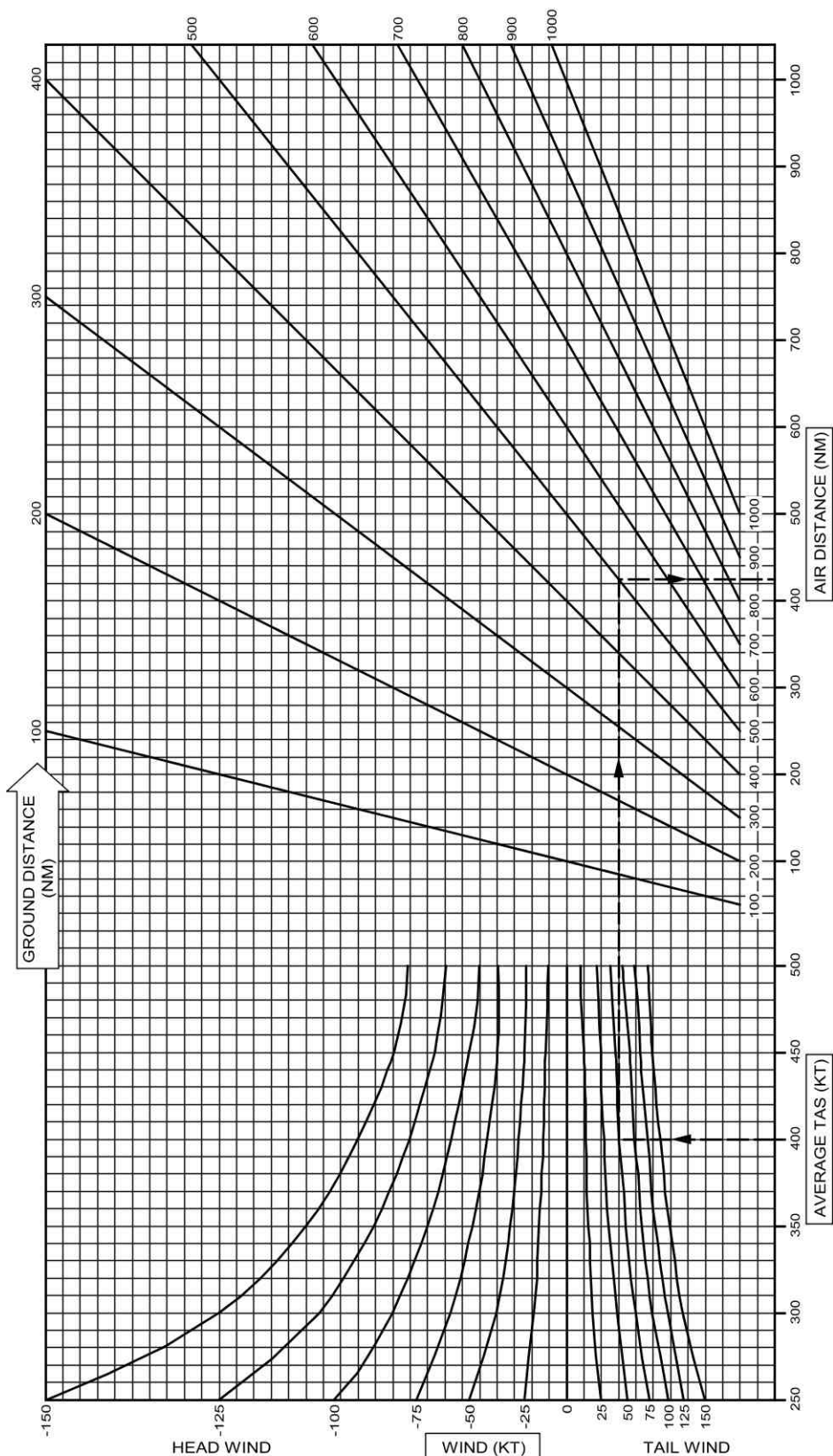
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING CRUISE : LONG RANGE - DESCENT : 250KT IMC PROCEDURE : 120 KG (6MIN)								FL100
NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)							
	50	55	60	65	70	75	80	
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15	
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18	
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21	
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24	
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27	
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30	
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34	
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37	
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40	
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43	
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46	
260	1870 1.03	1936 1.00	2004 0.59	2074 0.57	2148 0.55	2222 0.52	2277 0.50	
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.58	2396 0.55	2456 0.53	
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.58	2634 0.56	
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.59	
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02	
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06	
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09	
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12	
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15	
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19	
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22	
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25	
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29	
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32	
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35	
AIR CONDITIONING OFF ΔFUEL = - 1.5 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %		TOTAL ANTI ICE ON ΔFUEL = + 6 %			

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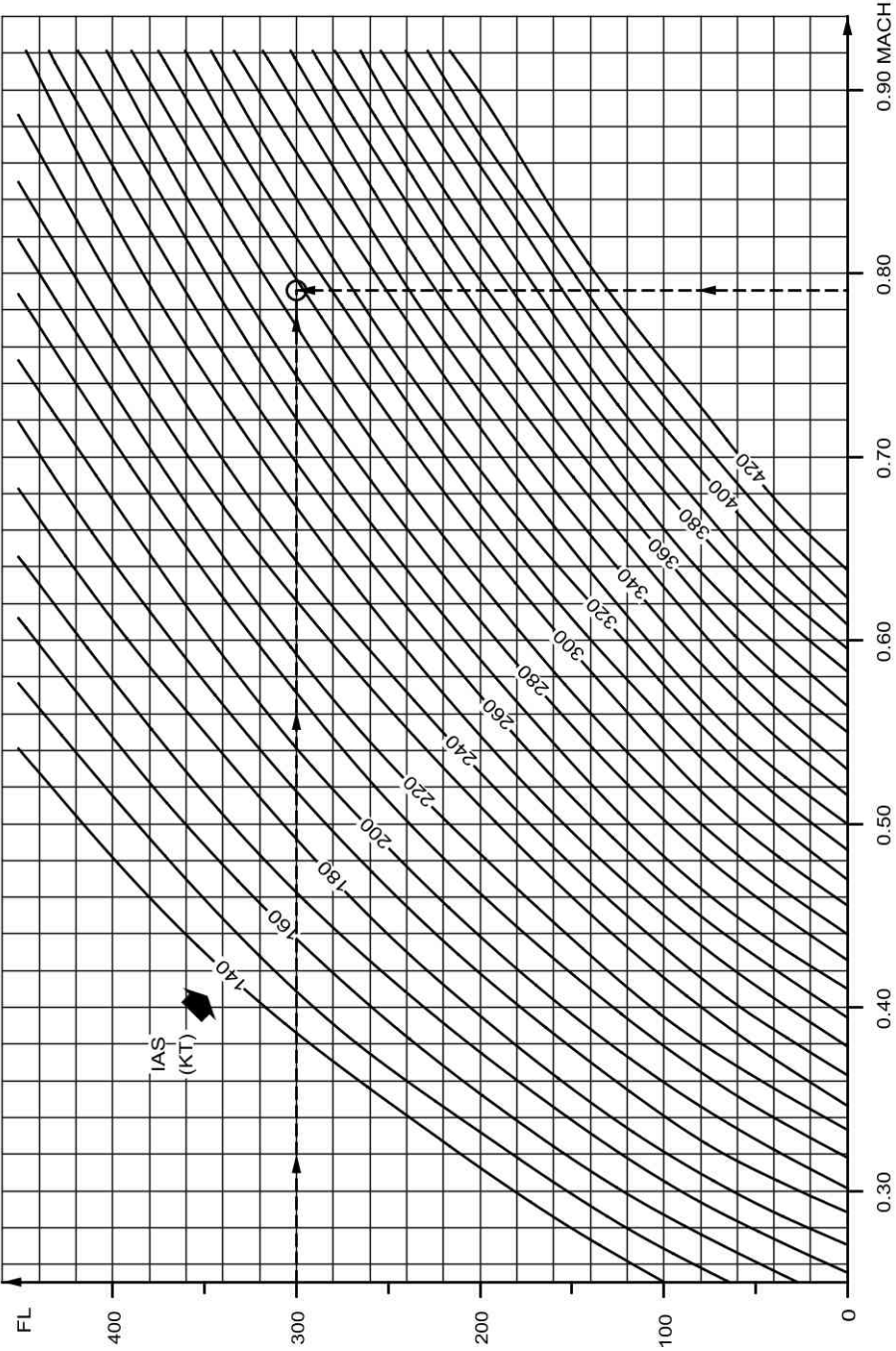
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: *In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.*

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  
 $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$   
 This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  
 $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$   
 This additional fuel must be added to the fuel predictions provided by the FMS.

Note: *Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:*

- *Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or*
- *If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.*

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
			If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
L/G	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT	L/G DOOR	All landing gears doors are extended	15 %
	DOORS NOT CLOSED			

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**


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**SEVERE TURBULENCE..... OPS.01**

**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

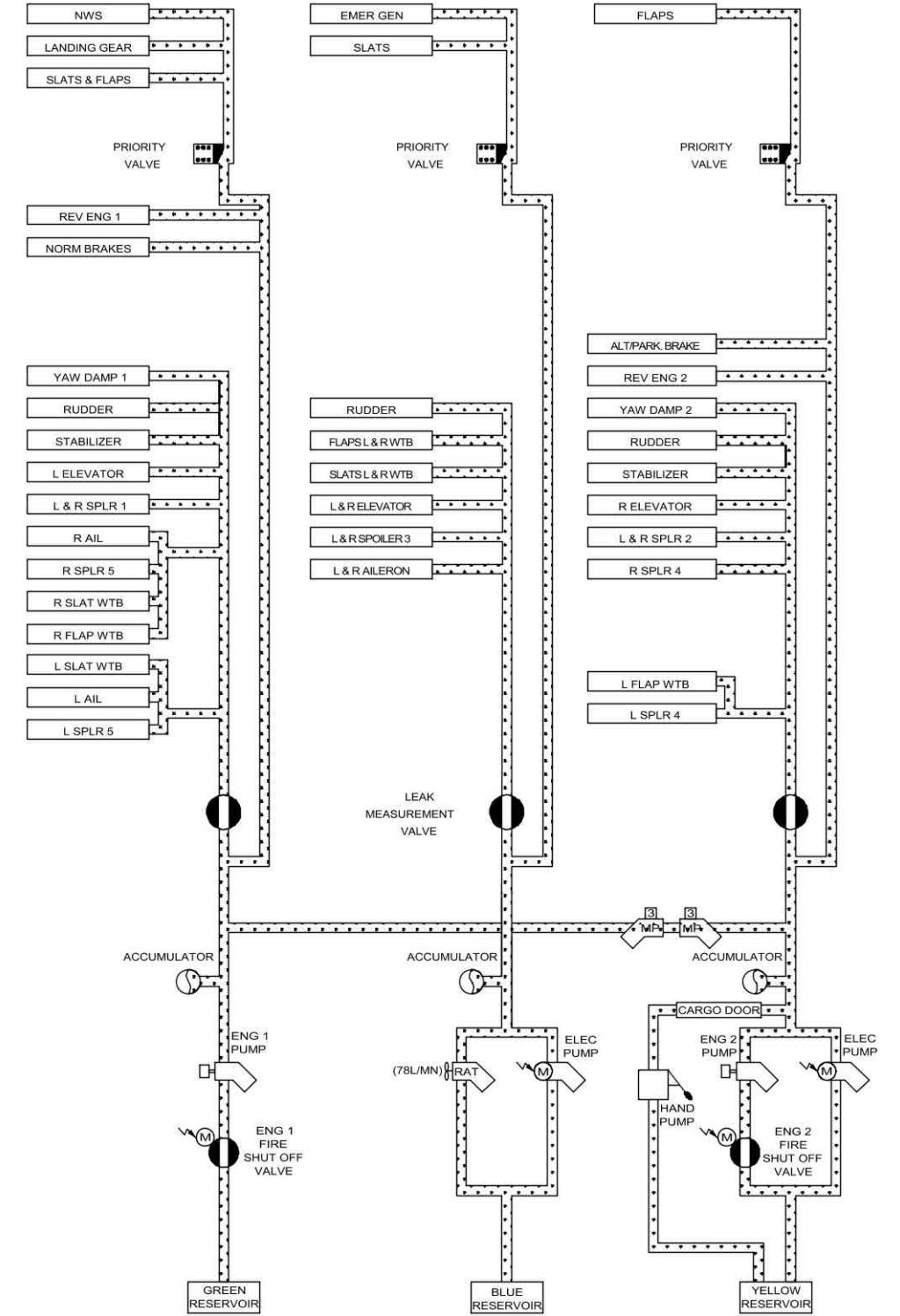
FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

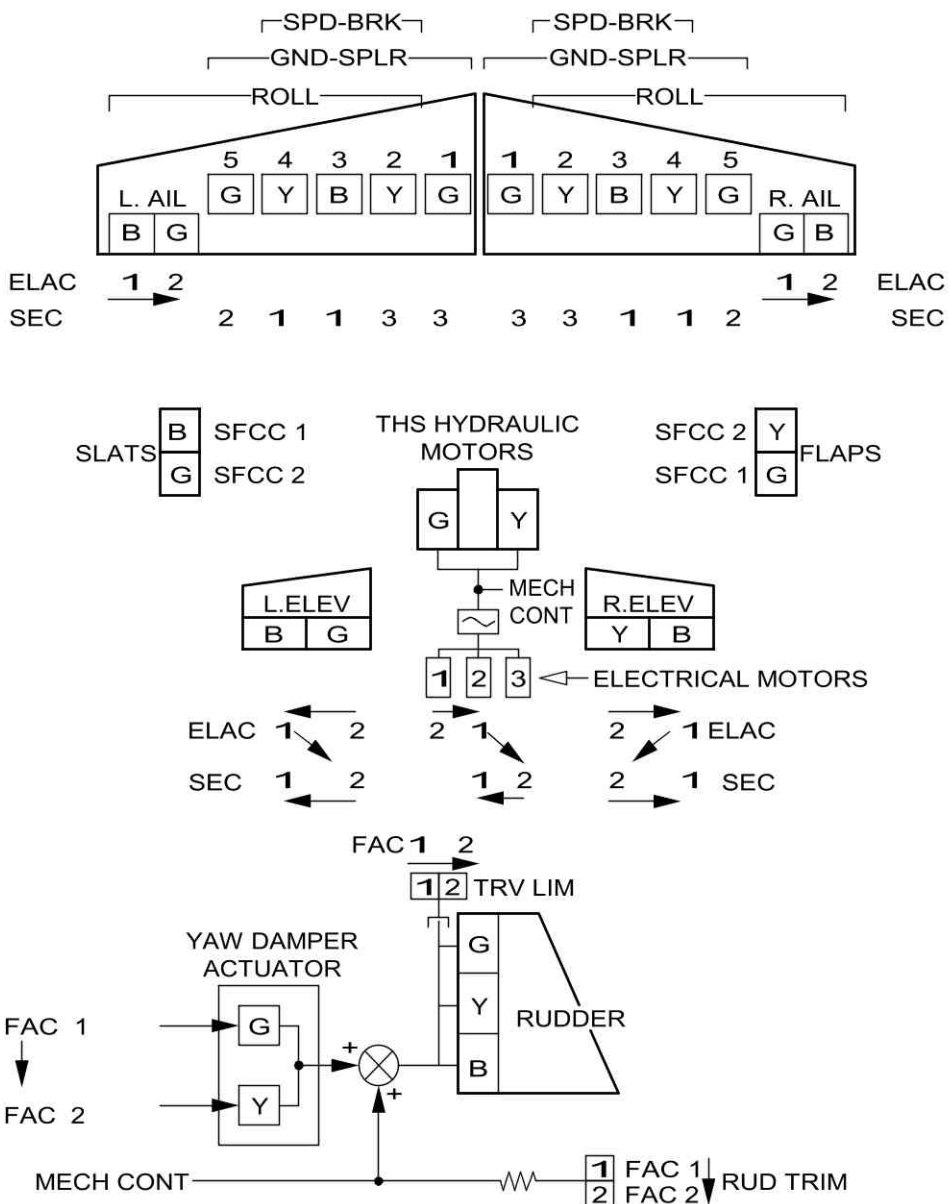
● **FOR APPROACH:**

A/THR in managed speed.....USE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHURST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
ADR/IR	2/2	2/2	3/3	
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.



# **OPERATIONS ENGINEERING BULLETINS**

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## **OEBPROC-PLP PRELIMINARY PAGES**

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## **OEBPROC-11 "ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight**

<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.00</b>
----------------------------------------------------------------	--------------

<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.01</b>
----------------------------------------------------------------	--------------

## **OEBPROC-17 Dual FM Reset upon Radial Fix Info Entry**

<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.00</b>
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<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.01</b>
------------------------------------------------------	--------------

## **OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.00</b>
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<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.01</b>
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## **OEBPROC-36 No SRS Engagement During Go Around in the Case of EPR Mode Fault**

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.00</b>
------------------------------------------------------------------------------	--------------

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.01</b>
------------------------------------------------------------------------------	--------------

## **OEBPROC-38 Erroneous Radio Altimeter Height Indication**

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.00</b>
---------------------------------------------------------	--------------

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.01</b>
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## **OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**

<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.00</b>
------------------------------------------------------------------------	--------------

<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.01</b>
------------------------------------------------------------------------	--------------

## **OEBPROC-43 F/CTL SPOILER FAULT**

<b>F/CTL SPOILER FAULT.....</b>	<b>43.00</b>
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<b>F/CTL SPOILER FAULT.....</b>	<b>43.01</b>
---------------------------------	--------------

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

L/G GEAR NOT DOWNLOCKED.....	44.00
■ L/G GEAR NOT DOWNLOCKED ■.....	44.01



## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an ENG 1(2) OIL FILTER CLOG ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		11.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSN					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HSN					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		17.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSN				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSN				



## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

*Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).*

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
Criteria: SA Applicable to: B-HSN					
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
Criteria: SA Applicable to: B-HSN					



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB36 Issue 1.0

### NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		36.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSN					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSN					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSN				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSN				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSN				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSN				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



# AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).



## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSN				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSN				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



**F/CTL SPOILER FAULT (Cont'd)**

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*





## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSN				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSN				

L/G GEAR NOT DOWNLOCKED

**ECAM ENTRY**

L/G GEAR NOT DOWNLOCKED

**PROCEDURE**

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

L/G GEAR NOT DOWNLOCKED
<i>This warning appears, if the landing gear sequence is not completed after 30 seconds.</i>
L/G lever.....RECYCLE
•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:
L/G GRAVITY EXTENSION PROC.....APPLY
STATUS
The status displayed on the ECAM is correct.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	BLANK
		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSO**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSO</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HSO</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSO</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HSO</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSO</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSO</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSO</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12


<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	1/2
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-31	MULTIPLE UNDUE ECAM ALERTS	00013755.0001001	30 MAR 12
	Criteria: 31A1220, 31-1276, P8671, P9824 <b>Applicable to: B-HSO</b> Impacted DU: NONE <u>Reason for issue:</u> This Temporary Revision is issued to give a procedure to the crew in the case of multiple suspected undue ECAM alerts.			

	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 21 - Air Conditioning/Ventilation/Pressurization	00013738.0001001	30 MAR 12
	Criteria: K10463 <b>Applicable to: B-HSO</b> Impacted DU: NONE			
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSO</b> Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls <u>Reason for issue:</u> This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	4023	HDA 0057	B-HSO	320-232

(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12


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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P9355		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - REMOVE WXR TRANSCIEVER COLLINS -623 AND DEACTIVATE PWS (ANTI-MOD 32740/26560)
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P9907		07 APR 11	INDICATING RECORDING SYSTEM - FLIGHT WARNING COMPUTER (FWC)- INSTALL FWC STANDARD H2-F4
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K9458		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL IMPROVED AIR COND. SYSTEM CONTROLLER PN 1803B0000-01
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	K11694		30 AUG 10	E/F -MISCELLANEOUS EMERGENCY EQUIPMENT- INSTALL ELT (406AFN) WITH RCP IN COCKPIT AND NAV PROVISIONS - HONEYWELL
	<b>Applicable to: ALL</b>			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>2/6</b>
		30 MAR 12


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	<b>Applicable to: ALL</b>			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P10267		07 APR 11	NAVIGATION - RADIO MAGNETIC INFORMATION SWITCHING AND INDICATING - RE-INSTALL THALES DDRMI VOR/DME INDICATORS
	<b>Applicable to: ALL</b>			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	<b>Applicable to: ALL</b>			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	<b>Applicable to: ALL</b>			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	<b>Applicable to: ALL</b>			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	<b>Applicable to: ALL</b>			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	<b>Applicable to: ALL</b>			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	<b>Applicable to: ALL</b>			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF RAIN REPELLENT SYSTEM
	<b>Applicable to: ALL</b>			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	<b>Applicable to: ALL</b>			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	<b>Applicable to: ALL</b>			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	<b>Applicable to: ALL</b>			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			

 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>3/6</b>
		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	P7062		30 AUG 10	OXYGEN - CREW OXYGEN - INSTALL ALTERNATIVE 115CU FT FLIGHT CREW OXYGEN CYLINDER COMPOSITE SCOTT P/N 897940-15
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	Applicable to: ALL			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	Applicable to: ALL			
	K6443		07 APR 11	AIR CONDITIONING-AIR COOLING- INSTALL A NEW ECS
	Applicable to: ALL			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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**GEN-PLP PRELIMINARY PAGES**

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General Information.....	GEN.03

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.



## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : Index of the back cover page interior                                                                                           |
| C3              | : Index of the back cover page exterior                                                                                           |
| "BLANK"         | : Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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## **ABN-PLP PRELIMINARY PAGES**

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## **ABN-21 Air Conditioning/Ventilation/Pressurization**

<b>CABIN OVERPRESSURE.....</b>	<b>21.01</b>
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## **ABN-22 Auto Flight**

<b>LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset).....</b>	<b>22.01</b>
<b>LOW ENERGY WARNING.....</b>	<b>22.02</b>

## **ABN-24 Electrical**

<b>ELEC EMER CONFIG SYS Remaining.....</b>	<b>24.01</b>
<b>ELEC EMER CONFIG Summary.....</b>	<b>24.02</b>

## **ABN-25 Equipment**

<b>COCKPIT DOOR FAULT.....</b>	<b>25.01</b>
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## **ABN-26 Fire Protection**

<b>■ SMOKE/FUMES REMOVAL ■.....</b>	<b>26.01</b>
<b>■ SMOKE/FUMES/AVNCS SMOKE ■.....</b>	<b>26.02</b>

## **ABN-27 Flight Controls**

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<b>SIDESTICK/RUDDER PEDALS STIFF.....</b>	<b>27.03</b>
<b>RUDDER JAM.....</b>	<b>27.04</b>
<b>STABILIZER JAM.....</b>	<b>27.05</b>

## **ABN-28 Fuel**

<b>FUEL IMBALANCE.....</b>	<b>28.01</b>
<b>FUEL LEAK.....</b>	<b>28.02</b>
<b>GRVTY FUEL FEEDING.....</b>	<b>28.03</b>

## **ABN-29 Hydraulic**

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<b>HYD G + B SYS LO PR Summary.....</b>	<b>29.02</b>
<b>HYD G + Y SYS LO PR Summary.....</b>	<b>29.03</b>

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■ ENG DUAL FAILURE - NO FUEL REMAINING ■.....	70.02
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■ Forced Landing ■.....	80.04
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CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

LAND ASAP

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

CAUTION	Check that $\Delta P$ is zero before opening the doors.
---------	---------------------------------------------------------

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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.


Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>				
<b>ELEC EMER CONFIG SYS REMAINING</b>		<b>EMER GEN RUNNING</b>	<b>BAT ONLY</b>	
			<b>IN FLIGHT</b>	<b>ON THE GROUND</b>
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1+ N° 2	N° 1+ N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	ABCU	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



*Continued from the previous page*

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	ISIS	Norm	Norm	Norm
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a) Restored, when speed is below 100 kt.

(b) Crew oxygen valve inoperative.


(c) Lost, when speed is below 50 kt.

(d) Lost 30 s after last engine shutdown.

(e) IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f) For APU start only.

(g) Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
<b>DRY Runway</b>	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● If one or more electrical latches (strikes) are faulty:

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● If two pressure sensors are faulty:

Automatic latch release is not available, in case of cockpit decompression.

● If no LED on the CKPT DOOR CONT panel is on:

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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SMOKE/FUMES REMOVAL

EMER EXIT LIGHT..... ON

● **If fuel vapors:**

CAB FANS..... ON

PACK 1+2..... OFF

● **If no fuel vapors:**

CAB FANS..... OFF

PACK FLOW..... HI

LDG ELEV..... 10 000 FT/MEA

DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

ATC..... NOTIFY

SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE

*While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*

● **At FL 100 OR MEA:**

APU MASTER SW (if in ELEC EMER CONFIG)... ON

PACK 1+2..... OFF

MODE SEL..... MAN

MAN V/S CTL..... FULL UP

RAM AIR..... ON

APU MASTER SW..... OFF

● **If smoke persists, open CKPT window:**

MAX SPEED..... 200 KT

COCKPIT DOOR..... OPEN

HEADSETS..... ON

PNF COCKPIT WINDOW..... OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE



## SMOKE/FUMES/AVNCS SMOKE

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

● **IF REQUIRED:**

CREW OXY MASKS..... ON/100%/EMERG

● **IF SMOKE SOURCE IMMEDIATELY OBVIOUS,  
ACCESSIBLE, AND EXTINGUISHABLE:**

FAULTY EQPT..... ISOLATE

● **IF SMOKE SOURCE NOT IMMEDIATELY  
ISOLATE:**

DIVERSION..... INITIATE

DESCENT (FL 100, or MEA, or minimum obstacle  
clearance altitude)..... INITIATE

● **AT ANY TIME of the procedure, if SMOKE/FUMES  
becomes the GREATEST THREAT :**

SMOKE/FUMES REMOVAL..... CONSIDER

ELEC EMER CONFIG..... CONSIDER

*Refer to the end of the procedure to Set ELEC  
EMER CONFIG*

● **At ANY TIME of the procedure, if situation  
becomes UNMANAGEABLE :**

IMMEDIATE LANDING..... CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

**● IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
BLOWER..... AUTO  
EXTRACT..... AUTO  
PACK 1..... OFF

**● If smoke continues:**

PACK 1..... ON  
PACK 2..... OFF

**● If smoke still continues:**

PACK 2..... ON  
BLOWER..... OVRD  
EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

**● IF CAB EQUIPMENT SMOKE SUSPECTED:**

**● If smoke continues:**

EMER EXIT LIGHT..... ON  
COMMERCIAL..... OFF  
SMOKE DISSIPATION..... CHECK  
FAULTY EQPT..... SEARCH/ISOLATE

**● If smoke still continues or if faulty  
equipment confirmed isolated:**

COMMERCIAL..... NORM

SMOKE/FUMES REMOVAL..... CONSIDER





## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

#### ● WHEN EMER GEN AVAIL:

APU GEN.....OFF  
GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

#### ● AT 3 min OR 2 000 ft AAL BEFORE LANDING:

GEN 2..... ON  
EMER ELEC GEN 1 LINE.....ON

#### ● WHEN A/C IS STOPPED:

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


Note:

- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED						
Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	200 kt		200 kt	185 kt	177 kt	
S > 3	177 kt		177 kt	177 kt	177 kt	

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM

CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

**STABILIZER JAM**

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

- **IF MAN TRIM AVAIL:**  
TRIM FOR NEUTRAL ELEV  
*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

- **IF MAN TRIM NOT AVAIL:**  
FOR LDG.....USE FLAP 3  
*Do not select configuration full so as not to degrade the handling qualities.*  
GPWS LDG FLAP 3..... ON  
CAT 2 INOP

FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON

- **On the lighter side and in the center tank:**  
FUEL PUMPS.....OFF
- **When fuel is balanced:**  
FUEL PUMPS (WING + CTR)..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

FUEL X FEED..... USE AS RQRD


*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.





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**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*
- **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**  
 CTR TK PUMP 1+2..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	<i>Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75</i>								
<b>CONTA runway (CONF 3)</b>	<i>Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90</i>								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

**HYD G + B SYS LO PR SUMMARY**

CRUISE	
SPD BRK.....DO NOT USE MAX SPD..... 320/0.77 MANEUVER WITH CARE ALTN LAW : PROT LOST	
<div style="border: 1px solid black; display: flex; justify-content: space-between;"> <div style="width: 45%;">           LANDING CONF            Use FLAP 3         </div> <div style="width: 55%;">           APPROACH SPEED            VAPP = VREF + 25 kt         </div> </div>	

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP SLATS JAMMED/FLAPS SLOW ATHR..... OFF GPWS LDG FLAP 3..... ON  <div style="margin-left: 20px;"> <b>● WHEN SPD 200 KT</b>            L/G..... GRVTY EXTN    <b>● WHEN L/G down: USE MAN PITCH TRIM</b>            For Flaps extension: SPD SEL..... VFE NEXT- 5KT  <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i> </div>

LANDING
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law  <b>SPOILERS:</b> Only 2 per wing <b>REVERSER:</b> Only N°2 <b>BRAKING:</b> ALTERNATE


GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption  <div style="margin-left: 20px;"> <b>● For circuit:</b>            MAINTAIN SLATS/FLAPS CONFIGURATION            Recommended speed: MAX SPD - 10 kt    <b>● For diversion:</b>            SELECT CLEAN CONFIGURATION            If Slats at zero: Normal operating speeds            If Slats not at zero: Recommended speed MAX SPD -10 kt         </div>

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
<b>WEIGHT (1 000 KG)</b>	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
<b>WET runway</b>	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
<b>CONTA runway</b>	<i>Refer to the Landing Distance table without Autobrake            ( CONF FULL) and apply LDG DIST Factor = 1.95</i>								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (*Refer to VAPP Calculation*).

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## HYD G + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS SLOW / FLAPS JAMMED	
GPWS FLAP MODE.....	OFF
● For Flaps extension:	
SPD SEL.....	VFE NEXT - 5KT
When in landing CONF : DECELERATE TO CALCULATED VAPP	
Stabilize at VAPP before L/G down, to be trimmed for approach.	
L/G GRAVITY EXTENSION	

LANDING											
<b>FLARE:</b> PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law											
<b>SPOILERS:</b> Only 1 per wing											
<b>NO REVERSER</b>											
<b>BRAKING:</b> BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI											
<b>NO NOSEWHEEL STEERING</b>											


GO-AROUND											
NO GEAR RETRACTION. Increased fuel consumption											
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt											
<b>● For diversion:</b> <b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds <b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt											

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10								
CORRECTIONS	+ 1 000 ft above SL				+ 10 kt tailwind				
DRY runway	+ 3 %				+ 18 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE		
<div>● If icing conditions cannot be avoided:</div> <div>One of affected ADRs..... OFF</div> <div><u>NAV</u> ADR DISAGREE</div>		

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or INVALID DATA message),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, ECAM DUs or MCDU 1 is(are) affected.

GEN 1 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 1 ..... ON

#### ■ If DUs stop flashing:

GEN 1 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 2 ..... ON

#### ■ If DUs stop flashing:

GEN 2 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ DU is blank (with or without a large letter “F” in amber), or the display is distorted:

DU (affected) ..... AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected) ..... USE

*Transfer SD to the F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected) ..... USE

### ■ INVALID DISPLAY UNIT message is displayed:

This may be caused by a DU failure.

FOR AUTOMATIC DU RECOVERY ..... WAIT MORE THAN 40 s



## DISPLAY UNIT FAILURE (Cont'd)

- **IF DU IS AUTOMATICALLY RECOVERED:**  
No crew action is required.
  
- **IF DU IS NOT RECOVERED:**  
Non-recovered DU..... AS RQRD  
*The DU can be switched off.*
  
- **INVALID DATA message appears (not on all DUs):**  
EIS DMC SWITCHING..... AS RQRD
  
- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note: The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
  
- **INVALID DATA message appears on all DUs:**  
The autopilot, autothrust and MCDU navigation data are still available, and may be used.  
FOR AUTOMATIC DUs RECOVERY ..... WAIT MORE THAN 40 s
  
- **IF ALL DUs ARE AUTOMATICALLY RECOVERED:**  
No crew action is required.
  
- **IF ONE OR MORE DUs ARE NOT RECOVERED:**  
Non-recovered DUs..... OFF FOR 40 s  
Non-recovered DUs..... BACK ON sequentially
  - **If the initial failure re-occurs (INVALID DATA message appears on all DUs), when switching a given DU back ON:**  
Apply the entire procedure again, from the beginning.  
Leave this specific DU permanently OFF.
  
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY ..... OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

MULTIPLE UNDUE ECAM ALERTS

- In the case of multiple undue ECAM alerts concerning :
- ENG 1(2) N1(N2) (EGT) (FF) OVER LIMIT or
  - ENG 1(2) N1(N2) (EGT) (EPR) (FF) DISCREPANCY or,
  - NAV ATT(ALT) (HDG) DISCREPANCY or,
  - NAV FM/GPS POS DISAGREE or,
  - FUEL F.USED/FOB DISAGREE or,
  - MINIMUM or HUNDRED ABOVE callouts,

possibly associated with EFIS red flags, apply the below procedure :

AFFECTED PARAMETERS..... CROSSCHECK

*Crosscheck the affected parameters on the E/WD, PFD, ND or on the related SD page to confirm that the alerts are spurious.*

- **If it is confirmed that the ECAM alerts are spurious, identify the faulty DMC :**  
EIS DMC SWITCH.....CAPT 3  
*DMC 3 replaces DMC 1. If the undue alerts stop, DMC 1 is the faulty DMC.*
- **If unsuccessful :**  
EIS DMC SWITCH.....F/O 3  
*DMC 3 replaces DMC 2. If the undue alerts stop, DMC 2 is the faulty DMC.*

LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

- Note:
1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
  2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
  3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
  4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

Note: The free-fall system may be reset in flights used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed. The flight crew should not reset the free-fall system on the ground after flight.

### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL</b> SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOME LT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.





LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE


- **If NOSE L/G abnormal:**  
 NOSE..... MAINTAIN UP  
*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*  
 BRAKES (compatible with elevator efficiency)..... APPLY  
 ENG MASTERS..... OFF  
*Shutdown the engines before nose impact.*

- **If one MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*At touchdown, shut down both engines.*  
 FAILURE SIDE WING..... MAINTAIN UP  
*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*  
 DIRECTIONAL CONTROL..... MAINTAIN  
*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

- **If both MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*Shut down the engines in the flare, before touchdown.*  
 PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

**WHEN A/C STOPPED**

ENG (all) and APU FIRE pushbutton..... PUSH  
*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*  
 ENG (all) and APU AGENT..... DISCH

- **If Evacuation required:**  
 EVACUATION..... INITIATE  
 - All emergency and passenger doors may be used to evacuate the aircraft.  
 - Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

- **If Evacuation not required:**  
 CABIN CREW and PASSENGERS (PA)..... NOTIFY  
*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

ASYMMETRIC BRAKING


Normal braking is faulty, or the green hydraulic system is in low pressure, and all brakes of one gear are released.

Apply brake progressively on the available side. Counter swing with the rudder.  
Avoid crosswind in excess of 10 knots from the side of the available brake.

- **If only one reverse is available:**  
Do not use Reverse on the side of the available brake.

LDG DIST PROC..... APPLY

*Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables; in case of NORM BRK FAULT or G SYS LO PR.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>34.01</b>
		30 MAR 12

Intentionally left blank

ALL ADR OFF

SPD.....FLY THE GREEN  
*Fly within the green area of the speed scale to ensure safe flight. For slats/flaps retraction, it is better to fly at the top of the green area of the speed scale.*

**CAUTION** | *The altitude displayed on the PFD is a GPS altitude.*

BACK UP NAV..... USE  
*When ADRs are OFF, both FMs are lost.  
Revert to Back Up Nav via the NAV B/UP prompt on the MCDU MENU page.*

NAVAID TUNING..... USE RMP  
*Set both RMPs to NAV.*

MANUAL CABIN PRESSURE CONTROL

MODE SEL..... MAN  
MAN V/S CTL..... AS RQRD  
MAN CAB PR CTL  
TGT V/S : CLIMB 500 ft/min  
DESC 300 ft/min

A/C GPS ALT	CAB ALT TGT
410	8000
350	7000
300	5500
250	3000
<200	0

FOR APPROACH

SPD.....FLY THE GREEN  
*Before extending the slats/flaps, it is better to fly at the bottom of the speed scale green area, and to be in straight flight.*

FOR LDG.....USE FLAP 3  
LDG DIST PROC..... APPLY  
*Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables*

APPR SPD.....FLY THE BUG  
*During the approach, the bug indicates VAPP.*

● WHEN FLAP 2

LDG GRVTY EXTN.....DOWN

**CAUTION** | *All gear doors remain open.*

● WHEN L/G DOWNLOCKED:

L/G lever.....DOWN  
GEAR DOWN indications..... CHECK

● DURING FINAL APPROACH:

MAN V/S CTL.....FULL UP

**CAUTION** | *Check that the outflow valve is fully open and that cabin altitude is at airfield elevation before opening the doors.*



STATUS

INOP SYS

REAC W/S DET



ALL ADR OFF (Cont'd)

	<div>PRED W/S DET </div> <div>F/CTL PROT</div> <div>ADR 1+2+3</div> <div>RUD TRV LIM</div> <div>AP 1+2</div> <div>A/THR</div> <div>CAB PR 1+2</div> <div>GPWS</div> <div>GPWS TERR </div> <div><b><u>Other INOP SYS</u></b></div> <div>RAT automatic extension</div> <div>ATC ALTI MODE</div> <div>TCAS</div> <div>L/G RETRACT</div>
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**NAV FM / GPS POS DISAGREE**

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 ° ,
- 0.9 min for latitudes at or above 55 ° and below 70 ° ,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.

- **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.

- **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.

- **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.

- **If not:**  
Deselect GPS and revert to basic information.

- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.

During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
Aircraft must stay level with constant speed during 30 s.

MODE SELECTOR..... ATT  
LEVEL A/C ATTITUDE..... HOLD  
CONSTANT A/C SPEED..... MAINTAIN

● MCDU INITIALIZATION:

DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*  
IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*  
A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*





## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target:

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS

Respect Stall Warning.

To monitor speed, refer to IRS Ground Speed or GPS Ground Speed variations.

CAUTION	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

**AFFECTED ADR IDENTIFICATION**

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

- **If at least one ADR is reliable:**  
 Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM  
*Alternates sources may be used to evaluate the air data:*
  - GPS altitude.
  - GPS and IRS ground speeds, taking into account altitude and wind effect.

- **If affected ADR(s) cannot be identified, or if all ADRs are affected:**
  - **When above FL 250:**  
 ONE ADR..... KEEP ON  
 TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*  
 For flight continuation, *Refer to Climb, Cruise and Descent tables.*
  - **When below FL 250, if speed still unreliable:**  
 ALL ADRs P/B..... OFF  
*All ADRs must be switched OFF to replace the PFD's normal speed scale and altitude indication to the Back Up Speed Scale and GPS altitude indication.*  
 SPD..... FLY THE GREEN  
 NAV ADR 1+2+3 FAULT

**CLIMB**  
Set the thrust to CL.

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
FL 250 - FL 320	275 kt	4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

**CRUISE**  
Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
FL 250 - FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

**DESCENT**  
Set the thrust to IDLE.



UNRELIABLE SPEED INDICATION/ADR  
CHECK PROC (Cont'd)

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320 - FL 250	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE



## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



AIR DUAL BLEED FAULT (Cont'd)

- If engine bleed recovery was not successful, or if one pack is inoperative :  
 X BLEED..... CHECK OPEN  
 DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
 APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
 WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
 APU BLEED..... ON  
 MAX FL200  
 AVOID ICING CONDITIONS
- IF ICE ACCRETION  
 APPR SPD.....VLS + 10 KT  
 LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**

CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**

APU (IF AVAIL).....START

● **WHEN BELOW FL 200**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172







## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*



## ENG DUAL FAILURE - NO FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THRUST LEVERS..... IDLE  
FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....220 KT/GREEN DOT

*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1 /ATC1.....USE

ATC..... NOTIFY

CREW OXY MASKS (Above FL 100)..... ON

CABIN AND COCKPIT..... PREPARE

SIGNS..... ON

COMMERCIAL..... OFF

USE RUDDER WITH CARE

### ● WHEN BELOW FL 150

RAM AIR..... ON

## COMMON ACTIONS FOR THE APPROACH

### APPROACH PREPARATION

Note: *Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).*

BARO..... SET

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

## IF FORCED LANDING ANTICIPATED

### APPROACH

FOR LDG.....USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**


ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

  - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*


## ENG RELIGHT (IN FLIGHT)

MAX ALTITUDE.....See below  
 ENG MASTER (affected).....OFF  
 THR LEVER (affected)..... IDLE  
 ENG MODE SEL..... IGN  
 X BLEED ..... OPEN  
 WING A. ICE (for starter assist).....OFF  
 ENG MASTER (affected)..... ON

*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*

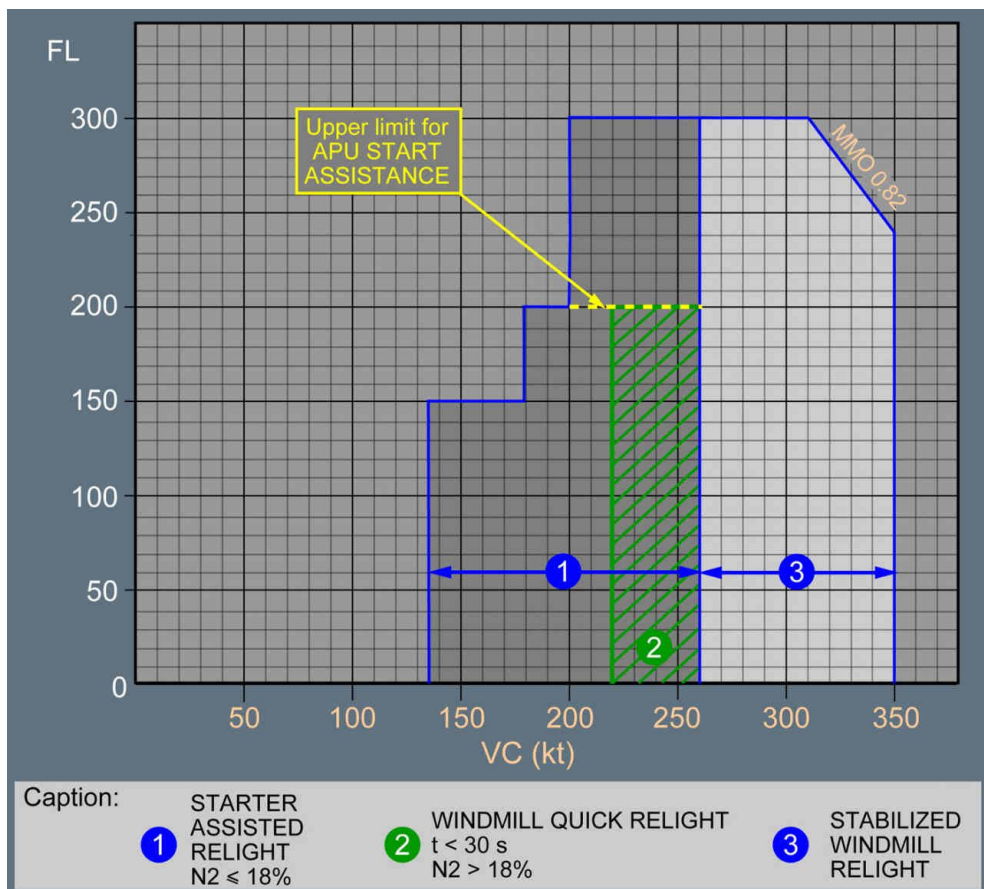
*Engine light up should be achieved within 30 s after fuel flow increases.*

■ **When idle is reached (AVAIL indication pulses in green) :**

ENG MODE SEL..... NORM  
 TCAS MODE SEL  ..... check TA/RA  
*Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*  
 Affected SYS..... RESTORE

■ **If no relight :**

ENG MASTER (affected)..... OFF  
*Wait 30 s before attempting a new start (to drain the engine).*





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION

External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM





## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

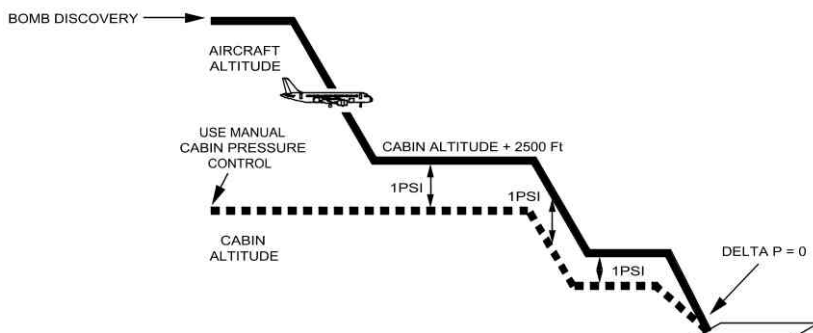
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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BOMB ON BOARD (Cont'd)

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

The cabin crews must command passengers to switch off all portable electronic devices.

BOMB.....CHECK NO ANTI-LIFT DEVICE

To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.

If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.

If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.

If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.

EMERGENCY EQUIPMENTS.....REMOVE AND STOW

Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.

GALLEY/IFE POWER.....OFF

All galley and IFE equipments located close to the LRBL must be switched off.

● If the bomb can be moved:

RH AFT CABIN DOOR SLIDE..... DISARM

LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.

On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.

Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.

CAUTION

DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

BOMB INDICATION LINE..... POSITION

Note:

A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.


Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.

BOMB..... MOVE TO LRBL

Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.

CAUTION

Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.



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## BOMB ON BOARD (Cont'd)

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

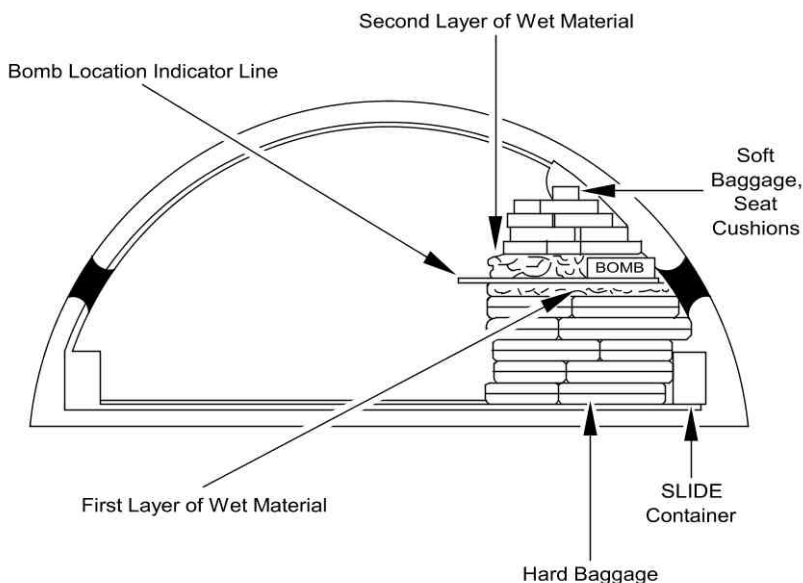
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



PASSENGERS.....MOVE/ADVISE


*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE <i>Evacuate through normal and emergency exits on the opposite side of the “bomb” location. Do not use the door just opposite the “bomb”.</i> <i>Use all available airport facilities to disembark without delay.</i>		





## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT.....ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE



	FORCED LANDING (Cont'd)	
--	-------------------------	--

ELT..... CHECK EMITTING <i>If not, switch on the transmitter.</i>		
■ <b>If Evacuation not required:</b>		
CABIN CREW and PASSENGERS (PA)..... NOTIFY		

## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


### WHEN DESCENT ESTABLISHED

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

**CAUTION** Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: The recommendation is to descend with the autopilot engaged.  
 Use of the autopilot is also permitted in EXPEDITE mode .

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

*Use the ECAM flap setting, if required for abnormal operations. In all other cases :*

- *FULL is preferred for optimized landing performance*
  - *If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.*
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.*

Note:     *For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.*

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

*Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.*

● **In the final approach stages**

TARGET SPEED..... VLS

*Reduce the selected speed on the FCU to reach VLS at runway threshold.*

*Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).*

● **At main landing gear touchdown**

REVERSE THRUST..... USE MAX AVAILABLE

● **After nosewheel touchdown**

BRAKES.....APPLY AS NECESSARY

*Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.*

● **Landing complete**

BRAKE FANS  ..... ON

*Be prepared for tire deflation, if temperatures exceed 800 °C.*

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								

# STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note:     *In case of lack of pitch down authority, reducing thrust may be necessary.*

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note:     *In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note:     *If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

# STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note:     *When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.*

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.  
Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- If the aircraft enters a volcanic ash cloud:
 

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
PACK FLOW.....	HI

Note:     If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

If airspeed is unreliable or lost,Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

Note:     If all engines flame out and speed indications are lost,Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note:     If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

Due to the increased noise level, pay particular attention to visual warnings.





## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.





## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*

Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

**WINDSHIELD/WINDOW ARCING**

Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)



## WINDSHIELD/WINDOW CRACKED

DIAGNOSIS OF INNER PLY.....PERFORM

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL.....230/MEA

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

CAB PRESS MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


CAB PRESS MODE SEL.....AUTO

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

CAB PRESS MODE SEL.....MAN

MAN V/S CTL.....FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>
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SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
OXY	Cockpit oxygen bottle pressure < 600 PSI.	If mask is not being used, check if it is correctly stowed.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).



## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION

$$VAPP = VREF + \Delta VREF + APPR COR$$

=

VREF												
Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78	
VREF (KT) = VLS CONF FULL	CG < 25%	108	113	118	123	127	131	136	140	144	148	149
	CG ≥ 25%	106	111	116	121	125	129	134	138	142	146	147

+

$\Delta VREF^{(1)}$

+

APPRoach CORrection		
if $\Delta VREF \leq 10$ kt	if $10 \text{ kt} < \Delta VREF < 20$ kt	if $\Delta VREF \geq 20$ kt
APPR COR is the Highest of		
5 kt * if A/THR ON and / or in case of ice accretion**	1/3 Headwind Max = 15 kt	APPR COR = 1/3 Headwind Max = 10 kt
APPR COR + $\Delta VREF$ limited to 20 kt		APPR COR = 0 kt

\* Multiply the landing distance by an additional factor of 1.1

\*\* In CONF3, add another 5 knot speed increment and multiply the landing distance by an additional factor of 1.2 (instead of 1.1)

=

$$VAPP = VREF + \Delta VREF + APPR COR$$

TO BE INSERTED IN THE MCDU PERF APPR PAGE

(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:


Failure : ALTN LAW  
Flight Conditions : Autothrust ON, ice accretion  
Landing Configuration : CONF 3  
Headwind : 12 kt  
Landing Weight/CG : 48 t/25 %  
VREF determined from the landing weight : 116 kt  
VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt}/3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136$  kt

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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors “WITHOUT REV”** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors “WITH REV”** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note: *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)

Compute the LDG DIST:


- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
	3	10			1.40×1.90×1.1=3.00
RESULT	3	10			


$VREF = 131\text{ kt.}$  Therefore  $VAPP = 131 + 10 + 5 = 146\text{ kt.}$



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FAILURES	Flaps Lever Position for Landing	$\Delta$ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S $\geq$ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



*Continued from the previous page*

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	if there is ice accretion				
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	2.30 2.45	1.90 2.05
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	2.40 2.55	2.35 2.50
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	DUAL IR FAULT/DUAL ADR FAULT	3	10	1.35*	1.30*
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	2.25 2.45	1.70 1.85
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	2.40 2.60	2.30 2.50
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.10 1.20
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
NAV	IR 1+2+3 FAULT	3	10	1.85	1.85
	DUAL IR FAULT/ DUAL ADR FAULT	3	10	1.35*	1.20*
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.00* 1.35*	1.90* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL


<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(f)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*





*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	3.35 3.90	1.60 1.75
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	3.45 3.95	3.30 3.65
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
NAV	IR 1+2+3 FAULT	3	10	1.45	1.45
	DUAL IR FAULT/DUAL ADR FAULT	3	10	1.30*	1.10
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.


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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.



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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
	AIR PACK 1(2) REGUL FAULT	ACSC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B W21 and W22 on 122VU</li> <li>- Pull C/B X21 and X22 on 122VU</li> <li>- Pull C/B Y18, Y20 and Y21 on 122VU</li> <li>- Pull C/B D8 on 49VU</li> <li>- Wait 5 s before pushing all the C/Bs.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	AUTO FLT FCU 1(2) FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>







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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.           </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.           </div>





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT and/or Loss of Passenger Address and/or Loss of Cabin Interphone	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: P13  and P14  on 121VU, G01 and G02 on 49VU, M05 and M06 on 121VU.</li> <li>- Wait 10 s, then:</li> <li>- Push the C/B in the following order: M05, M06, G01, G02, P13 , P14 .</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M06 on 121VU.</li> </ul> </li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M05 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M06, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: H01 on 49VU, Q14 on 121VU.</li> <li>- Wait 10 s, then:</li> <li>- Push the C/Bs in the following order: Q14, H01.</li> </ul>
24	GPU cannot be connected to the aircraft	GAPCU	<p><b>On ground only:</b></p> <p>The GPU cannot be connected to the electrical network of the aircraft (AVAIL light is OFF):</p> <ul style="list-style-type: none"> <li>• If at least one power source (IDG 1 or 2, APU GEN or batteries) is connected to the electrical network of the aircraft. <ul style="list-style-type: none"> <li>- Reset the EXT PWR pb on 35VU (Press and release)</li> </ul> </li> <li>• If no power source is connected to the electrical network of the aircraft. <ul style="list-style-type: none"> <li>- Set the BAT 1 pb-sw and BAT 2 pb-sw to AUTO.</li> </ul> </li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
26	SMOKE DET FAULT	CIDS-SDF	<b><u>On ground or in flight:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C05 and C06 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>
	SMOKE LAVATORY DET FAULT with all lavatories declared inoperative on the FAP	CIDS or CIDS-SDF	<b><u>On ground or in flight:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs P13 and P14  on 121VU, G01 and G02 on 49VU, M05 or M06 or M07 on 121VU.</li> <li>- Wait 5 s, then</li> <li>- Push the C/Bs in the following order: M05 or M06 and M06 or M07 on 121VU, G01 and G02 on 49VU, P13 and P14  ; on 121VU.</li> </ul> <b><u>If unsuccessful, on ground only:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C06 and C05 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>
	SMOKE FWD (AFT) CARGO DET FAULT SMOKE FWD (AFT) CRG 1 / 2 BTL FAULT	CIDS-SDF	<b><u>On ground:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C05 and C06 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><b>Note:</b></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the 3 C/B:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li><li>• Channel 1 and 2 (L26 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the 3 C/B.</li></ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	BRAKES SYS 1(2) FAULT or BRAKES BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><u>Note:</u>    After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>    After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	WHEEL N.W STEER FAULT or WHEEL N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>    After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	L/G LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:             <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:             <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<u>On ground only:</u> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
	ISIS malfunction	ISIS	<u>On ground only:</u> With aircraft not moving: <ul style="list-style-type: none"> <li>- Pull C/B F12 on 49VU,</li> <li>- Wait 5 s, then push the C/B,</li> <li>- Normal operation is expected after approximately 2 min.</li> </ul> <p><i>Note:</i>     <i>In the case of small aircraft motion during the C/B reset (refueling, cargo loading conditions, etc.), the ATT red flag may appear on the ISIS. In this case, press the RST P/B for 2 s, and wait 2 min to recover normal operation.</i></p>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus. <p><u>On ground, or in flight:</u></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

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# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

# CONTAMINATED RUNWAY OPERATIONS

● **TAKEOFF**

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

● **MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING**

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note:     The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

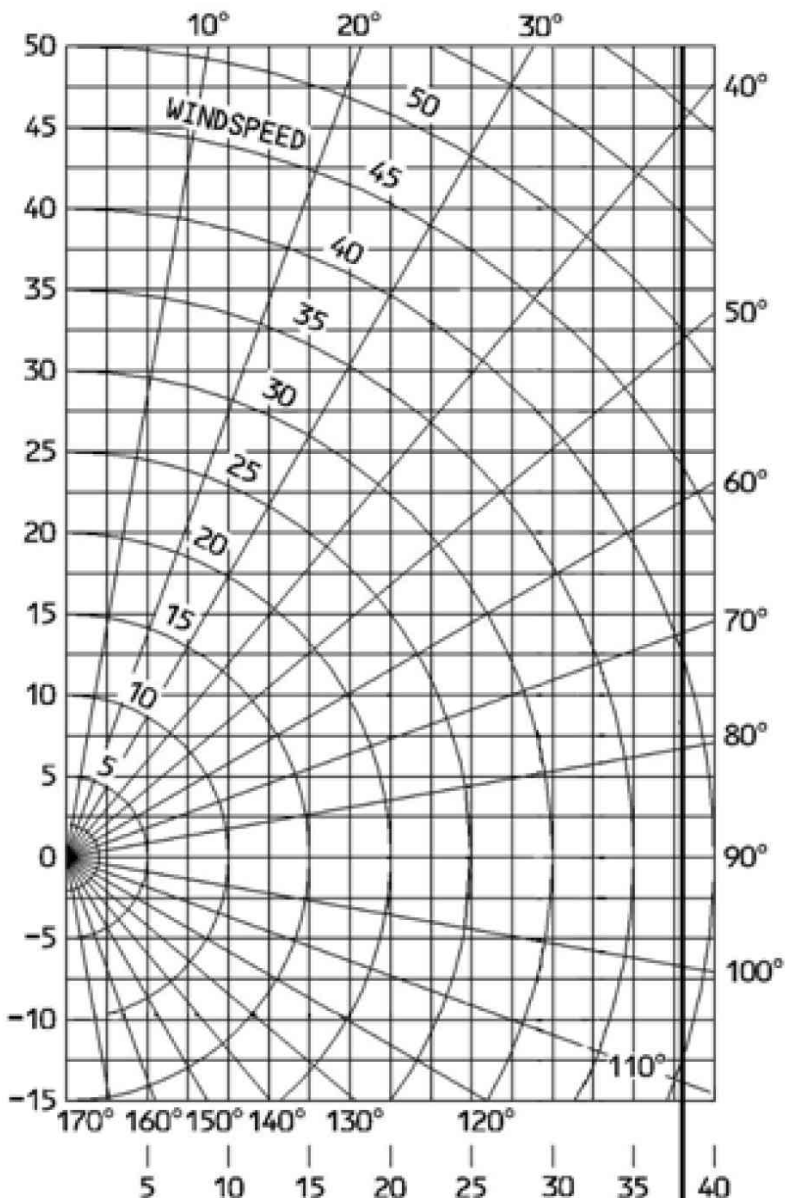
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320E

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT		01	
	EMER ELEC CONFIG		08		if there is ice accretion			
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		BRK RELEASED		02	
			S ≥ 1		03	ALTN L(R) RELEASED if NORM BRK FAULT		03
	1 ≤ FLAPS < 2	S < 1	04		ALTN L(R) RELEASED if G SYS LO PR		04	
			S ≥ 1		05	NORM BRK FAULT		05
	2 ≤ FLAPS < 3	S < 1	06		NORM + ALTN BRK FAULT		06	
			S ≥ 1	07	NAV	IR 1+2+3 FAULT		01
	FLAP = 3	S < 1	08	DUAL IR FAULT/DUAL ADR FAULT		02		
		1 ≤ S ≤ 3	09	ALL ADR OFF		03		
		S > 3	10	BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01	
	FLAP > 3	S < 1	11		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	12			REV UNLOCK with buffet (CONF 3)		02
		S > 3	13	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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**IN FLIGHT PERFORMANCE**

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**SPEEDS**

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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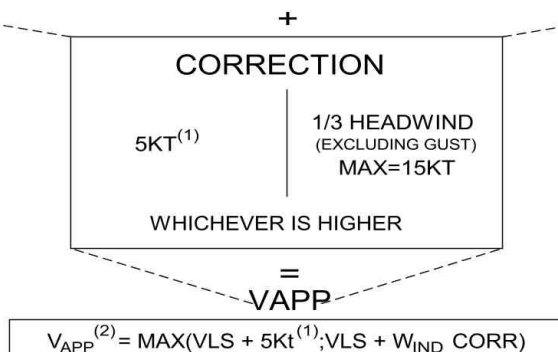
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

**LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3**

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)										
WEIGHT (1000 KG)		46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1250
	WET		970	1040	1110	1180	1260	1340	1420	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3600

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %	+16 %	+24 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+3 %
2 reversers operative	-5 %	-12 %	-15 %	-14 %	-12 %	-27 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 x 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 x 1.06 x 1.08 = 1 020 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

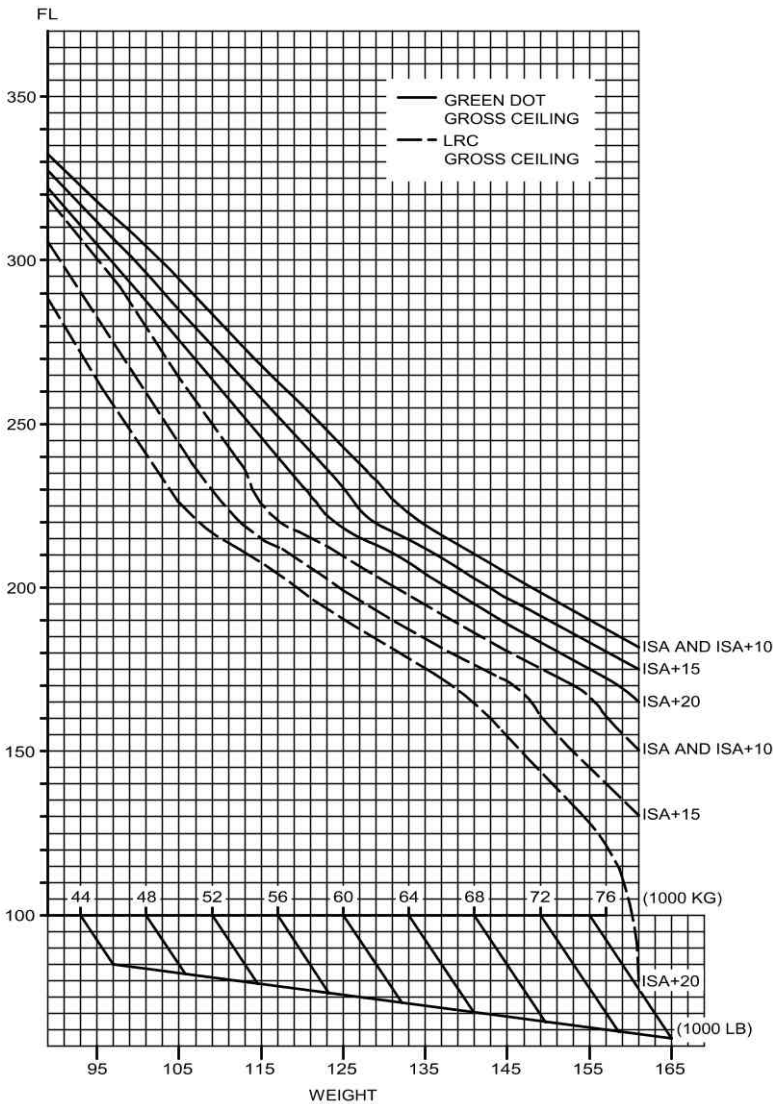
- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).



# CEILINGS

**ONE ENGINE OUT**

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT											
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)			
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)			
ANTI ICE OFF				LEVEL OFF (FT)							
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL										
	250	290	310	330	350	370	390				
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200				
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300				
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200				
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200				
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600				
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100				
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800				
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400				
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100				
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600				
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000					
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400					
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800					
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200					
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600						
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON					
FUEL		+ 14 %				+ 28 %					
TIME		+ 13 %				+ 26 %					
DISTANCE		+ 12 %				+ 23 %					
LEVEL OFF		- 700 ft				- 1800 ft					

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b>
		30 MAR 12

## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)	MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584	
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241	
<b>52</b>	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594	
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246	
<b>54</b>	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602	
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249	
<b>56</b>	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600	
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248	
<b>58</b>	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585	
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242	
<b>60</b>	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562	
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232	
<b>62</b>	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570		
	2434 285	2287 272	2225 266	2248 268	2055 246		
<b>64</b>	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544		
	2454 284	2382 279	2317 272	2272 267	2037 234		
<b>66</b>	1.243 .513	1.322 .556	1.397 .591	1.421 .585			
	2476 284	2432 281	2399 277	2264 263			
<b>68</b>	1.247 .512	1.330 .558	1.412 .599	1.426 .570			
	2499 283	2472 282	2473 280	2253 256			
<b>70</b>	1.254 .514	1.338 .560	1.426 .604	1.436 .543			
	2550 285	2516 283	2537 283	2232 243			
<b>72</b>	1.262 .517	1.351 .567	1.428 .598				
	2604 287	2592 286	2533 280				
<b>74</b>	1.270 .521	1.365 .575	1.432 .587				
	2666 289	2673 290	2523 274				
<b>76</b>	1.290 .539	1.381 .585	1.438 .571				
	2805 299	2767 296	2509 267				
<b>78</b>	1.308 .554	1.395 .593	1.450 .537				
	2927 307	2850 300	2478 250				
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>4/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG PACK FLOW HI ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)  TIME (H.MIN)			
AIR	DIST. FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
(NM)							100	150	200
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %					TOTAL ANTI ICE ON △FUEL = + 6 %				

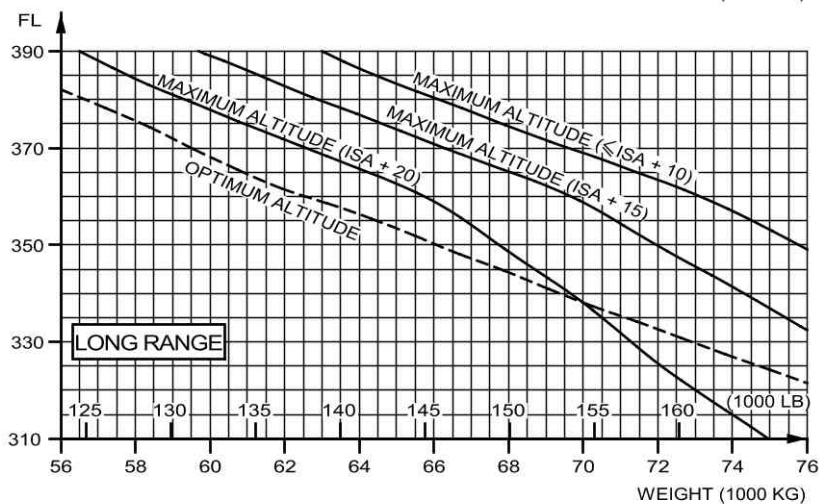
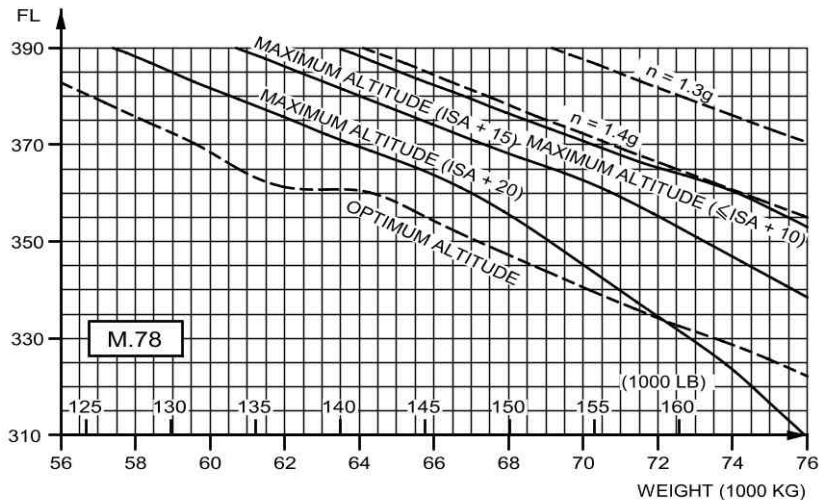
PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NO-04-08-140





## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-AEO</b> <b>2/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

### ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)  TIME (H.MIN)			
AIR  DIST.  (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING ΔFUEL = - 0.4 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %			TOTAL ANTI ICE ON ΔFUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NO-04-10-140

## COST INDEX FOR LONG RANGE CRUISE SPEED

### ALL ENGINES

For a quick determination of the  $CI_{LRC}$ , use:

- $CI_{LRC} = 40$  kg/min in the FMGC.
- or
- $CI_{LRC} = 55$  (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									IAS (KT)
	45				65				
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 3 %			ΔFUEL = + 7 %			

CL-W0-04-13-140





# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

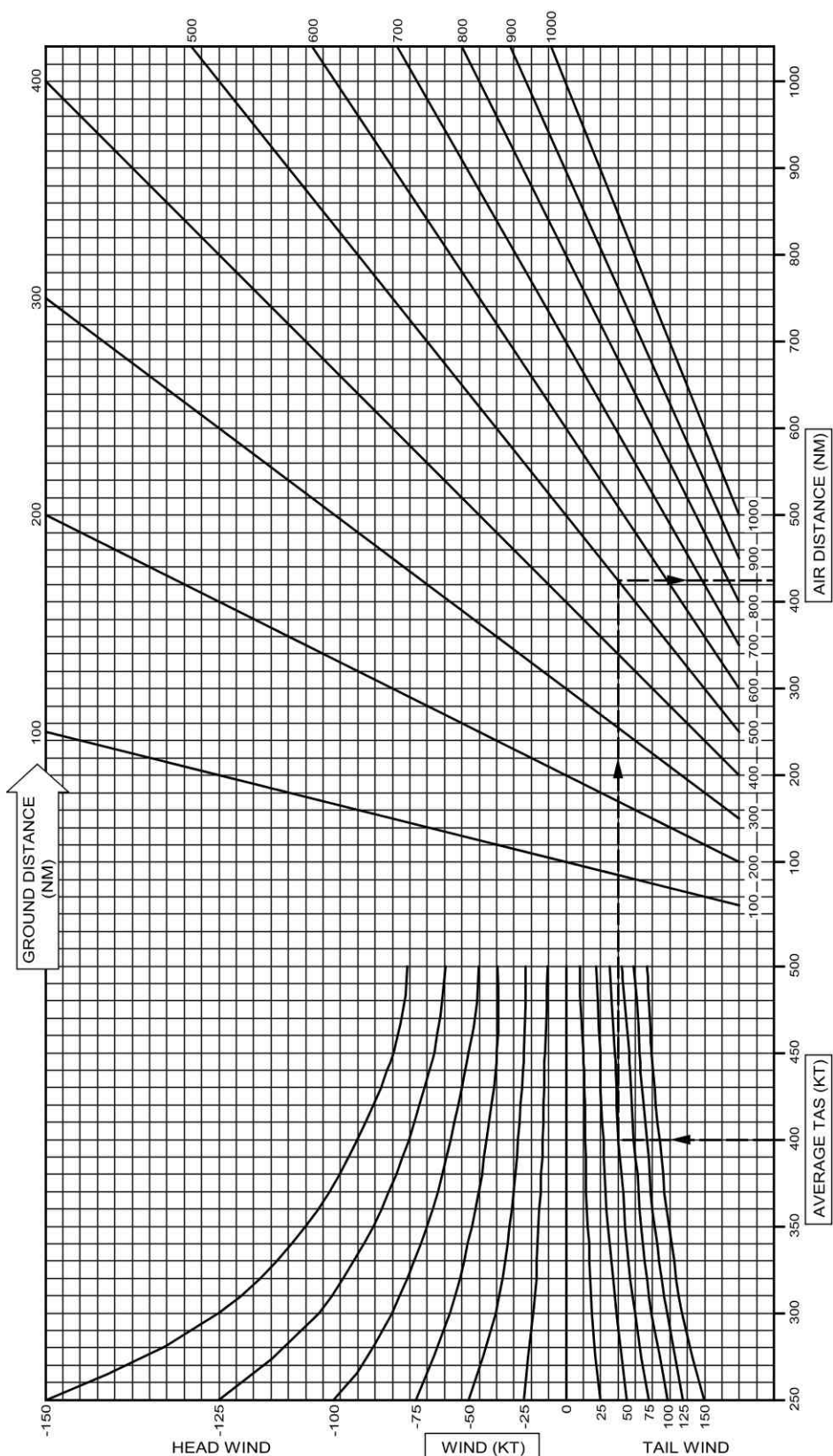
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING ANTI-icing OFF		ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46
260	1870 1.03	1936 1.00	2004 0.59	2074 0.57	2148 0.55	2222 0.52	2277 0.50
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.58	2396 0.55	2456 0.53
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.58	2634 0.56
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.59
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35
AIR CONDITIONING OFF ΔFUEL = - 1.5 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %		TOTAL ANTI ICE ON ΔFUEL = + 6 %		

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	IN FLIGHT PERFORMANCE	FPE-CAB <b>2/2</b>
		30 MAR 12

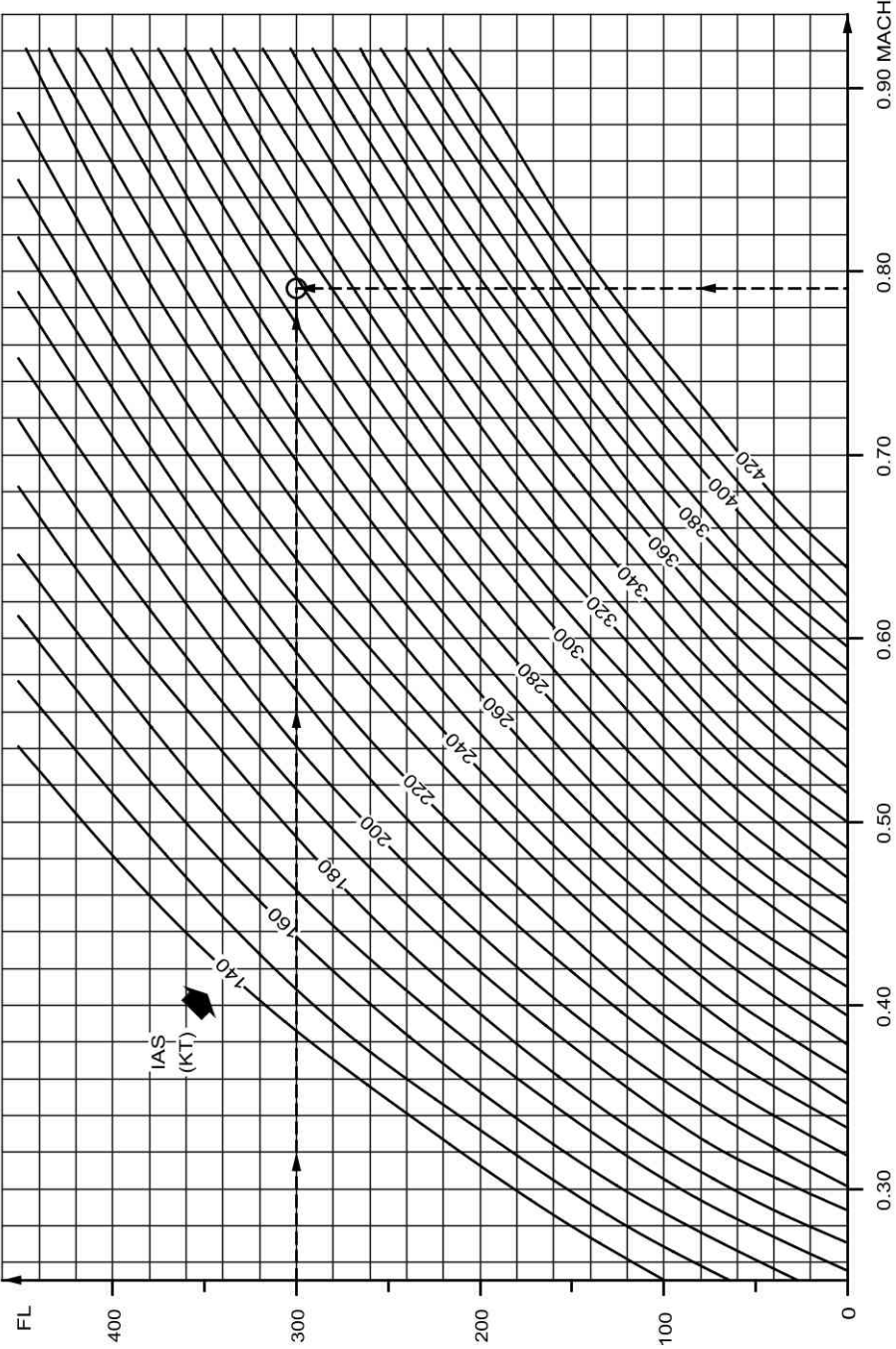
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

***Note:** In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEI condition). The flight crew must still compute and monitor the actual fuel consumption.*

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$
 This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$
 This additional fuel must be added to the fuel predictions provided by the FMS.

***Note:** Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:*

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**


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**SEVERE TURBULENCE..... OPS.01**

**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

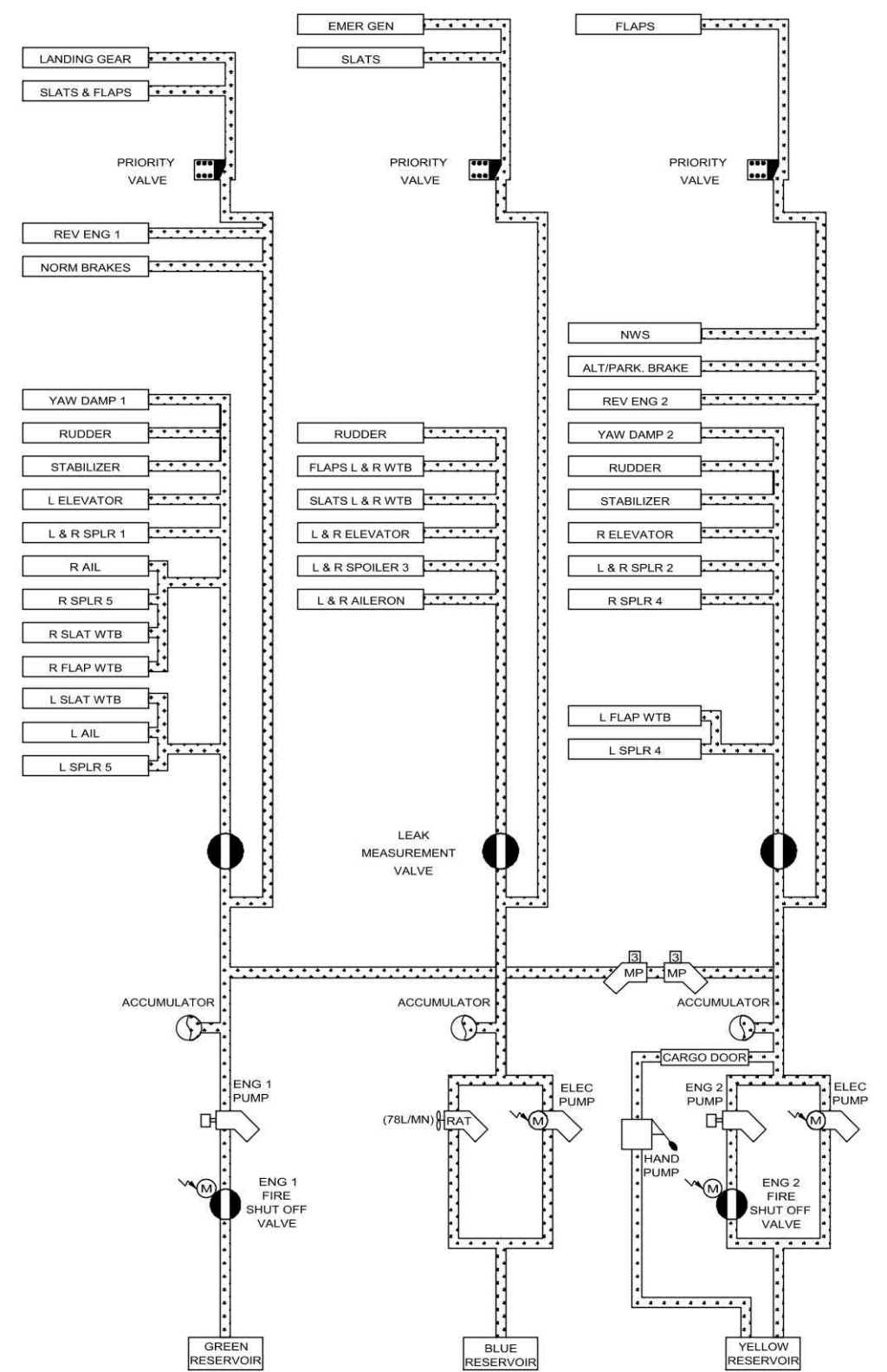
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

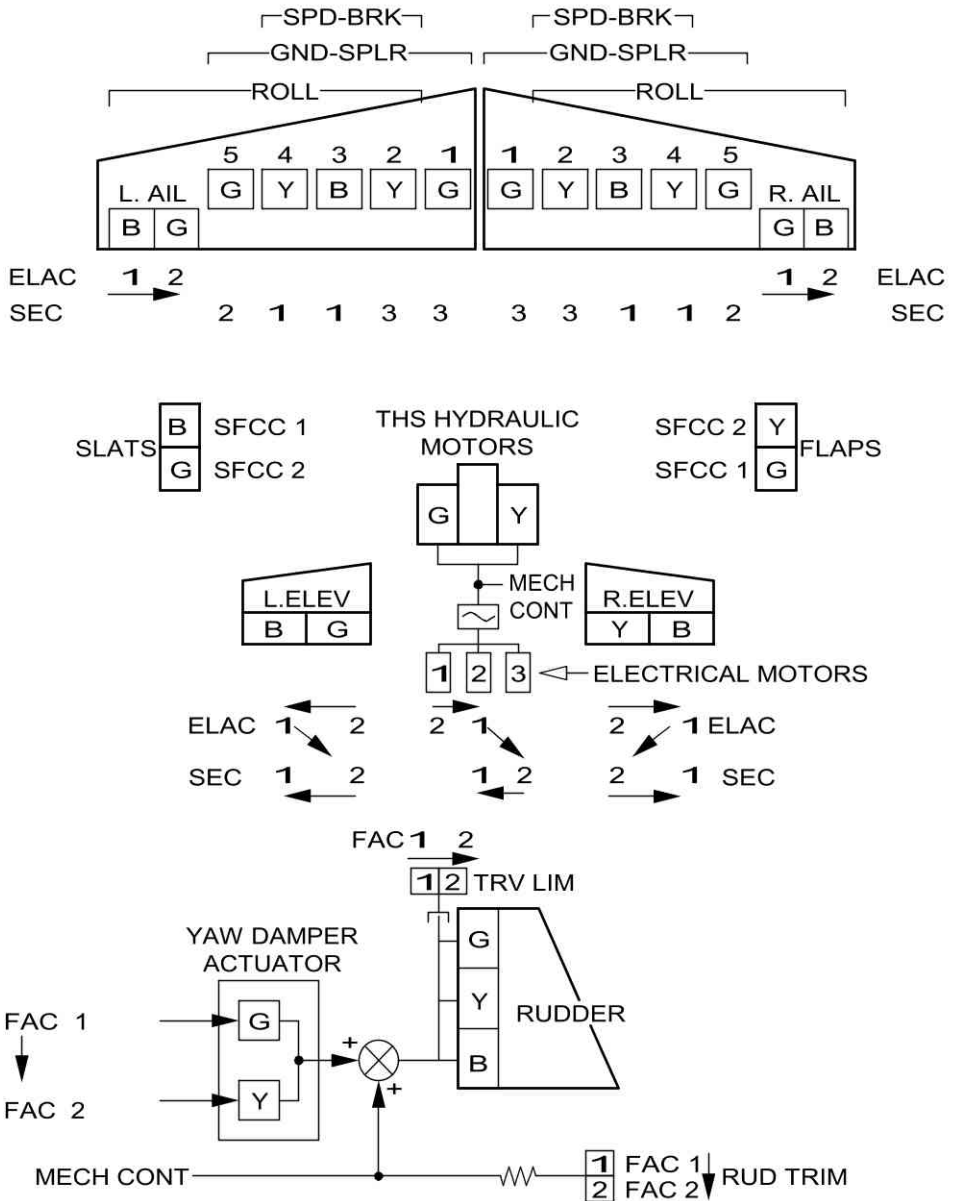
A/THR in managed speed.....USE

# HYDRAULIC ARCHITECTURE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.



# **OPERATIONS ENGINEERING BULLETINS**

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**OEBPROC-17 Dual FM Reset upon Radial Fix Info Entry**

**Dual FM Reset upon Radial Fix Info Entry..... 17.00**  
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**OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

**Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....31.00**  
**Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....31.01**

**OEBPROC-36 No SRS Engagement During Go Around in the Case of EPR Mode Fault**

**No SRS Engagement During Go Around in the Case of EPR Mode Fault.....36.00**  
**No SRS Engagement During Go Around in the Case of EPR Mode Fault.....36.01**

**OEBPROC-38 Erroneous Radio Altimeter Height Indication**

**Erroneous Radio Altimeter Height Indication..... 38.00**  
**Erroneous Radio Altimeter Height Indication..... 38.01**

**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**


**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.00**  
**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.01**

**OEBPROC-43 F/CTL SPOILER FAULT**

**F/CTL SPOILER FAULT..... 43.00**  
**F/CTL SPOILER FAULT..... 43.01**

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

**L/G GEAR NOT DOWNLOCKED..... 44.00**  
**■ L/G GEAR NOT DOWNLOCKED ■..... 44.01**

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSO				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSO				



## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

*Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).*

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSO				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSO				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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# OEB36 Issue 1.0

## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSO					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSO					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	<b>BLANK</b>
		30 MAR 12

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSO				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSO				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

 <div>DRAGONAIR</div> <div>A320/A321</div> <div>QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSO				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSO				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



# AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).





## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSO				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSO				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above  $V_{FE_{NEXT}}$ , the flight crew should deselect A/THR, decelerate to  $V_{FE_{NEXT}}$ , and select CONF 1 when below  $V_{FE_{NEXT}}$ . When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>44.00</b> 30 MAR 12
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## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSO				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSO				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

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		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSP**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date

No filing instructions


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSP</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HSP</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HSP</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HSP</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSP</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSP</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSP</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12


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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-31	<b>MULTIPLE UNDUE ECAM ALERTS</b>	00013755.0001001	30 MAR 12
	Criteria: 31A1220, 31-1276, P8671, P9824 <b>Applicable to: B-HSP</b> <i>Impacted DU: NONE</i> <u>Reason for issue:</u> <i>This Temporary Revision is issued to give a procedure to the crew in the case of multiple suspected undue ECAM alerts.</i>			

	ABN-80	<b>Computer Reset Table</b>	NG00824	
	ABN-80	<b>Computer Reset Table - 21 - Air Conditioning/Ventilation/Pressurization</b>	00013738.0001001	30 MAR 12
	Criteria: K10463 <b>Applicable to: B-HSP</b> <i>Impacted DU: NONE</i>			
	ABN-80	<b>Computer Reset Table - 27 - Flight Controls</b>	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSP</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:

- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.


M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	4247	HDA 0058	B-HSP	320-232

(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P9355		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - REMOVE WXR TRANSCIEVER COLLINS -623 AND DEACTIVATE PWS (ANTI-MOD 32740/26560)
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P9907		07 APR 11	INDICATING RECORDING SYSTEM - FLIGHT WARNING COMPUTER (FWC)- INSTALL FWC STANDARD H2-F4
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K9458		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL IMPROVED AIR COND. SYSTEM CONTROLLER PN 1803B0000-01
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	K11694		30 AUG 10	E/F -MISCELLANEOUS EMERGENCY EQUIPMENT- INSTALL ELT (406AFN) WITH RCP IN COCKPIT AND NAV PROVISIONS - HONEYWELL
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	<b>Applicable to: ALL</b>			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P10267		07 APR 11	NAVIGATION - RADIO MAGNETIC INFORMATION SWITCHING AND INDICATING - RE-INSTALL THALES DDRMI VOR/DME INDICATORS
	<b>Applicable to: ALL</b>			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	<b>Applicable to: ALL</b>			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	<b>Applicable to: ALL</b>			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	<b>Applicable to: ALL</b>			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	<b>Applicable to: ALL</b>			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	<b>Applicable to: ALL</b>			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	<b>Applicable to: ALL</b>			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF RAIN REPELLENT SYSTEM
	<b>Applicable to: ALL</b>			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	<b>Applicable to: ALL</b>			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	<b>Applicable to: ALL</b>			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	<b>Applicable to: ALL</b>			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			


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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	P7062		30 AUG 10	OXYGEN - CREW OXYGEN - INSTALL ALTERNATIVE 115CU FT FLIGHT CREW OXYGEN CYLINDER COMPOSITE SCOTT P/N 897940-15
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	Applicable to: ALL			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	Applicable to: ALL			
	K6443		07 APR 11	AIR CONDITIONING-AIR COOLING- INSTALL A NEW ECS
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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**GEN-PLP PRELIMINARY PAGES**

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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### CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure


PACK 1 or 2..... OFF  
BLOWER + EXTRACT..... OVRD  
*Cabin air is extracted overboard.*  
 $\Delta P$ ..... FREQUENTLY MONITOR

● If  $\Delta P > 9$  PSI  
PACK 1+2..... OFF

**LAND ASAP**

Before 10 min from landing:  
PACK 1+2..... OFF  
BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.
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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.


Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		



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ELEC EMER CONFIG SYS REMAINING				
ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1+ N° 2	N° 1+ N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	ABCU	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



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ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
PNEU	ISIS	Norm	Norm	Norm
	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
APU	X BLEED (MAN CTL)	Norm	Inop	Inop
	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
PWR PLT	FUEL PUMP	Norm	Norm	Norm
	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
MISC	HP FUEL VALVE closure	Norm	Norm	Norm
	MECH HORN	Norm	Norm	Norm

(a)

Restored, when speed is below 100 kt.

(b)

Crew oxygen valve inoperative.

(c)

Lost, when speed is below 50 kt.

(d)

Lost 30 s after last engine shutdown.

(e)


IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f)

For APU start only.

(g)

Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
<b>DRY Runway</b>	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
 In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK  
*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.  
 The system may be recovered by performing the following steps:

Cockpit door..... OPEN  
 COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:


COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT..... ON
- **If fuel vapors:**

CAB FANS.....ON
 

PACK 1+2..... OFF
- **If no fuel vapors:**

CAB FANS..... OFF
 

PACK FLOW..... HI
- LDG ELEV..... 10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE
- ATC..... NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*
- **At FL 100 OR MEA:**

APU MASTER SW (if in ELEC EMER CONFIG)... ON
 

PACK 1+2..... OFF
 

MODE SEL.....MAN
 

MAN V/S CTL..... FULL UP
 

RAM AIR.....ON
 

APU MASTER SW.....OFF

● **If smoke persists, open CKPT window:**

MAX SPEED.....200 KT
 

COCKPIT DOOR.....OPEN
 

HEADSETS..... ON
 

PNF COCKPIT WINDOW..... OPEN
- 
- HDA A320/A321 For A/C: B-HSP

**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE





## SMOKE/FUMES/AVNCS SMOKE

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

● **IF REQUIRED:**

CREW OXY MASKS..... ON/100%/EMERG

● **IF SMOKE SOURCE IMMEDIATELY OBVIOUS,  
ACCESSIBLE, AND EXTINGUISHABLE:**

FAULTY EQPT..... ISOLATE

● **IF SMOKE SOURCE NOT IMMEDIATELY  
ISOLATE:**

DIVERSION..... INITIATE

DESCENT (FL 100, or MEA, or minimum obstacle  
clearance altitude)..... INITIATE

● **AT ANY TIME of the procedure, if SMOKE/FUMES  
becomes the GREATEST THREAT :**

SMOKE/FUMES REMOVAL..... CONSIDER

ELEC EMER CONFIG..... CONSIDER

*Refer to the end of the procedure to Set ELEC  
EMER CONFIG*

● **At ANY TIME of the procedure, if situation  
becomes UNMANAGEABLE :**

IMMEDIATE LANDING..... CONSIDER



## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

### AIR COND SMOKE/CAB EQUIPMENT SMOKE

● **IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 PACK 1..... OFF

● **If smoke continues:**

PACK 1..... ON  
 PACK 2..... OFF

● **If smoke still continues:**

PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

● **IF CAB EQUIPMENT SMOKE SUSPECTED:**

● **If smoke continues:**

EMER EXIT LIGHT..... ON  
 COMMERCIAL..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE

● **If smoke still continues or if faulty  
equipment confirmed isolated:**

COMMERCIAL..... NORM

SMOKE/FUMES REMOVAL..... CONSIDER





## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

#### ● WHEN EMER GEN AVAIL:

APU GEN.....OFF  
GEN 2..... OFF

### ELEC EMER CONFIG


APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

#### ● AT 3 min OR 2 000 ft AAL BEFORE LANDING:

GEN 2..... ON  
EMER ELEC GEN 1 LINE.....ON

#### ● WHEN A/C IS STOPPED:

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

### ■ Repeat the following until landing configuration is reached:

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.

### ● As speed reduces through VFE NEXT:

FLAPS LEVER..... ONE STEP DOWN

### ■ When landing configuration is established:

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

### ■ IF SLATS FAULT:

#### ● FOR CIRCUIT:

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

#### ● FOR DIVERSION

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

### ■ IF FLAPS FAULT:

#### ● FOR CIRCUIT:

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

#### ● FOR DIVERSION:

##### ● If FLAPS jammed at 0

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- **If FLAPS jammed > 0**


MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


- Note:
- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
  - In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED						
Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	200 kt		200 kt	185 kt	177 kt	
S > 3	177 kt		177 kt	177 kt	177 kt	

<b>CAUTION</b>	For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.
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<b>SIDESTICK/RUDDER PEDALS STIFF</b>		
<p>Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:</p> <ul style="list-style-type: none"><li>- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or</li><li>- One sidestick and the rudder pedals at the same time.</li></ul> <p>The piloting technique remains the same: The aircraft remains responsive. However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.</p> <p>AP DISENGAGEMENT.....CONFIRM</p> <p>CONSIDER TRANSFERRING CONTROL TO PNF</p> <p>● <b>FOR DECRAB, ROLLOUT, OR ENGINE FAILURE</b></p> <p>BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL</p>		





## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

STABILIZER JAM
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The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

- **IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV  
*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

- **IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3  
*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP

FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON

- **On the lighter side and in the center tank:**  
FUEL PUMPS.....OFF
- **When fuel is balanced:**  
FUEL PUMPS (WING + CTR)..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.


FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



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**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*
- **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**  
 CTR TK PUMP 1+2..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75								
<b>CONTA runway (CONF 3)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● WHEN SPD 200 KT	
L/G.....	GRVTY EXTN
● WHEN L/G down: USE MAN PITCH TRIM	
For Flaps extension: SPD SEL.....	VFE NEXT- 5KT
When in landing CONF: DECELERATE TO CALCULATED VAPP	

LANDING
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law
<b>SPOILERS:</b> Only 2 per wing
<b>REVERSER:</b> Only N°2
<b>BRAKING:</b> ALTERNATE

GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt
<b>● For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt


ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
<b>WET runway</b>	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
<b>CONTA runway</b>	<i>Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95</i>								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (*Refer to VAPP Calculation*).



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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/0.77  
 MANEUVER WITH CARE  
 ALTN LAW : PROT LOST

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

### APPROACH

CAT 2 INOP  
 SLATS SLOW / FLAPS JAMMED  
 GPWS FLAP MODE..... OFF  
 ● **For Flaps extension:**  
 SPD SEL..... VFE NEXT - 5KT  
 When in landing CONF : DECELERATE TO CALCULATED VAPP  
 Stabilize at VAPP before L/G down, to be trimmed for approach.  
 L/G GRAVITY EXTENSION

### LANDING


**FLARE:** PITCH AUTHORITY REDUCED (No stabilizer).  
 MAN TRIM Unusable  
 Only 1 spoiler per wing – Direct law  
**SPOILERS:** Only 1 per wing  
**NO REVERSER**  
**BRAKING:** BRK Y ACCU PR ONLY (7 applications)  
 MAX BRK PR 1 000 PSI  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption  
 ● **For circuit:**  
 MAINTAIN SLATS/FLAPS CONFIGURATION  
 Recommended speed: MAX SPD - 10 kt  
 ● **For diversion:**  
 ● **If Flaps at zero:**  
 SELECT CLEAN CONFIGURATION  
 Normal operating speeds  
 ● **If Flaps not at zero:**  
 MAINTAIN SLATS/FLAPS CONFIG  
 Recommended speed: MAX SPD - 10 kt

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV										
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78	
<b>DRY runway</b>	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15									
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10									
<b>CORRECTIONS</b>	+ 1 000 ft above SL					+ 10 kt tailwind				
<b>DRY runway</b>	+ 3 %					+ 18 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or INVALID DATA message),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, ECAM DUs or MCDU 1 is(are) affected.

GEN 1 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 1 ..... ON

#### ■ If DUs stop flashing:

GEN 1 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 2 ..... ON

#### ■ If DUs stop flashing:

GEN 2 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ DU is blank (with or without a large letter “F” in amber), or the display is distorted:

DU (affected) ..... AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected) ..... USE

*Transfer SD to the F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected) ..... USE

### ■ INVALID DISPLAY UNIT message is displayed:

This may be caused by a DU failure.

FOR AUTOMATIC DU RECOVERY ..... WAIT MORE THAN 40 s



DISPLAY UNIT FAILURE (Cont'd)

- **IF DU IS AUTOMATICALLY RECOVERED:**  
 No crew action is required.
- **IF DU IS NOT RECOVERED:**  
 Non-recovered DU..... AS RQRD  
*The DU can be switched off.*
- **INVALID DATA message appears (not on all DUs):**  
 EIS DMC SWITCHING..... AS RQRD
- **If unsuccessful:**  
 DU (affected)..... OFF THEN ON  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVALID DATA message appears on all DUs:**  
 The autopilot, autothrust and MCDU navigation data are still available, and may be used.  
 FOR AUTOMATIC DUs RECOVERY ..... WAIT MORE THAN 40 s
- **IF ALL DUs ARE AUTOMATICALLY RECOVERED:**  
 No crew action is required.
- **IF ONE OR MORE DUs ARE NOT RECOVERED:**  
 Non-recovered DUs..... OFF FOR 40 s  
 Non-recovered DUs..... BACK ON sequentially
  - **If the initial failure re-occurs (INVALID DATA message appears on all DUs), when switching a given DU back ON:**  
 Apply the entire procedure again, from the beginning.  
 Leave this specific DU permanently OFF.
- **INVERSION OF THE EWD AND THE SD:**  
 ECAM UPPER DISPLAY ..... OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

MULTIPLE UNDUE ECAM ALERTS

- In the case of multiple undue ECAM alerts concerning :
- ENG 1(2) N1(N2) (EGT) (FF) OVER LIMIT or
  - ENG 1(2) N1(N2) (EGT) (EPR) (FF) DISCREPANCY or,
  - NAV ATT(ALT) (HDG) DISCREPANCY or,
  - NAV FM/GPS POS DISAGREE or,
  - FUEL F.USED/FOB DISAGREE or,
  - MINIMUM or HUNDRED ABOVE callouts,

possibly associated with EFIS red flags, apply the below procedure :

AFFECTED PARAMETERS..... CROSSCHECK

*Crosscheck the affected parameters on the E/WD, PFD, ND or on the related SD page to confirm that the alerts are spurious.*

- **If it is confirmed that the ECAM alerts are spurious, identify the faulty DMC :**  
EIS DMC SWITCH.....CAPT 3  
*DMC 3 replaces DMC 1. If the undue alerts stop, DMC 1 is the faulty DMC.*
- **If unsuccessful :**  
EIS DMC SWITCH.....F/O 3  
*DMC 3 replaces DMC 2. If the undue alerts stop, DMC 2 is the faulty DMC.*



LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*

L/G GRAVITY EXTENSION

CAUTION	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <u>WHEEL</u> SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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GRAVITY GEAR EXTN handcrank.....PULL AND TURN  
*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*  
 L/G lever..... DOWN  
 GEAR DOWN indications (if available)..... CHECK

- Note:
1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
  2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
  3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
  4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

■ **If successful:**

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

Note:     *The free-fall system may be reset in flights used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed.  
 The flight crew should not reset the free-fall system on the ground after flight.*

■ **If unsuccessful:**

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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**PREPARATION**

- CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF  
*Consider fuel reduction to a safe minimum.*
- **If NOSE L/G abnormal:**  
 CG location (if possible).....AFT
    - 10 passengers from front to rear moves the CG roughly 4 % aft.
    - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.
  - **If one MAIN L/G abnormal:**  
 FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*
- OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

**APPROACH**

- GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI
- **If one or both MAIN L/G abnormal:**  
 GROUND SPOILERS.....DO NOT ARM

**BEFORE LANDING**

- RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER
- **If the external light condition is poor at landing:**  
 DOME LT.....DIM

**FLARE, TOUCH DOWN AND ROLL OUT**

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.





## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

ASYMMETRIC BRAKING


Normal braking is faulty, or the green hydraulic system is in low pressure, and all brakes of one gear are released.

Apply brake progressively on the available side. Counter swing with the rudder.  
Avoid crosswind in excess of 10 knots from the side of the available brake.

- **If only one reverse is available:**  
Do not use Reverse on the side of the available brake.

LDG DIST PROC..... APPLY

*Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables; in case of NORM BRK FAULT or G SYS LO PR.*

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ALL ADR OFF

SPD.....FLY THE GREEN  
*Fly within the green area of the speed scale to ensure safe flight. For slats/flaps retraction, it is better to fly at the top of the green area of the speed scale.*

**CAUTION** | *The altitude displayed on the PFD is a GPS altitude.*

BACK UP NAV..... USE  
*When ADRs are OFF, both FMIs are lost.  
Revert to Back Up Nav via the NAV B/UP prompt on the MCDU MENU page.*

NAVAID TUNING..... USE RMP  
*Set both RMPs to NAV.*

MANUAL CABIN PRESSURE CONTROL

MODE SEL..... MAN  
MAN V/S CTL..... AS RQRD  
MAN CAB PR CTL  
TGT V/S : CLIMB 500 ft/min  
DESC 300 ft/min

A/C GPS ALT	CAB ALT TGT
410	8000
350	7000
300	5500
250	3000
<200	0

FOR APPROACH

SPD.....FLY THE GREEN  
*Before extending the slats/flaps, it is better to fly at the bottom of the speed scale green area, and to be in straight flight.*

FOR LDG.....USE FLAP 3  
LDG DIST PROC..... APPLY  
*Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables*

APPR SPD.....FLY THE BUG  
*During the approach, the bug indicates VAPP.*

● WHEN FLAP 2

LDG GRVTY EXTN.....DOWN

**CAUTION** | *All gear doors remain open.*

● WHEN L/G DOWNLOCKED:

L/G lever.....DOWN  
GEAR DOWN indications..... CHECK

● DURING FINAL APPROACH:

MAN V/S CTL.....FULL UP

**CAUTION** | *Check that the outflow valve is fully open and that cabin altitude is at airfield elevation before opening the doors.*

STATUS



INOP SYS

REAC W/S DET





ALL ADR OFF (Cont'd)

	<div>PRED W/S DET </div> <div>F/CTL PROT</div> <div>ADR 1+2+3</div> <div>RUD TRV LIM</div> <div>AP 1+2</div> <div>A/THR</div> <div>CAB PR 1+2</div> <div>GPWS</div> <div>GPWS TERR </div> <div><b><u>Other INOP SYS</u></b></div> <div>RAT automatic extension</div> <div>ATC ALTI MODE</div> <div>TCAS</div> <div>L/G RETRACT</div>
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

● **If the message occurs during ILS/LOC approach (LOC green):**

DISREGARD it.

● **If the message occurs in climb, cruise, or descent:**

CHECK navigation accuracy, using raw data.

■ **If the check is positive:**

NAV mode and ND ARC/ROSE NAV may be used.

■ **If the check is negative:**

HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

■ **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**

Use the associated FD/AP.

■ **If not:**

Deselect GPS and revert to basic information.

● **If the message occurs during a Non Precision Approach (NPA):**

■ **Overlay approach:**

SELECT HDG, or TRK, and use raw data.

■ **GPS or RNAV approach:**

GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
Aircraft must stay level with constant speed during 30 s.

MODE SELECTOR..... ATT  
LEVEL A/C ATTITUDE..... HOLD  
CONSTANT A/C SPEED..... MAINTAIN

● MCDU INITIALIZATION:

DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*  
IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*  
A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and  $V_{MAX}$ .*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS

Respect Stall Warning.  
To monitor speed, refer to IRS Ground Speed or GPS Ground Speed variations.

CAUTION	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

**AFFECTED ADR IDENTIFICATION**

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

- **If at least one ADR is reliable:**  
 Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM

*Alternates sources may be used to evaluate the air data:*  
 - GPS altitude.  
 - GPS and IRS ground speeds, taking into account altitude and wind effect.

- **If affected ADR(s) cannot be identified, or if all ADRs are affected:**
  - **When above FL 250:**  
 ONE ADR..... KEEP ON  
 TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*  
 For flight continuation, *Refer to Climb, Cruise and Descent tables.*
  - **When below FL 250, if speed still unreliable:**  
 ALL ADRs P/B..... OFF  
*All ADRs must be switched OFF to replace the PFD's normal speed scale and altitude indication to the Back Up Speed Scale and GPS altitude indication.*  
 SPD..... FLY THE GREEN  
 NAV ADR 1+2+3 FAULT

**CLIMB**  
 Set the thrust to CL.

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
FL 250 - FL 320	275 kt	4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

**CRUISE**  
 Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
FL 250 - FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

**DESCENT**  
 Set the thrust to IDLE.



UNRELIABLE SPEED INDICATION/ADR  
CHECK PROC (Cont'd)

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320 - FL 250	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE





## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :  
 X BLEED..... CHECK OPEN  
 DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
 APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
 WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
 APU BLEED..... ON  
 MAX FL200  
 AVOID ICING CONDITIONS
  - IF ICE ACCRETION  
 APPR SPD.....VLS + 10 KT  
 LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :  
**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THR LEVERS..... IDLE  
FAC 1.....OFF THEN ON  
ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT


*Note:* In the case of an “ENG DUAL FAILURE” during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.

In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).

LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE  
ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**  
ENG MASTERS..... OFF 30 S/ON  
*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**  
CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**  
APU (IF AVAIL)..... START

● **WHEN BELOW FL 200**  
WING ANTI ICE..... OFF  
APU BLEED..... ON  
ENG MASTERS (one at a time)..... OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



**ENG DUAL FAILURE - FUEL REMAINING (Cont'd)**

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


<b>Weight (1 000 kg)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>Vapp</b>	150	150	150	150	150	154	159	163	167	171	172

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)**  
 L/G lever..... CHECK UP

**AT 2 000 FT AGL**  
 CABIN..... NOTIFY FOR DITCHING  
 DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.*  
*If that causes a strong crosswind, ditch into the wind.*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*

**AT 500 FT AGL**  
 BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**  
 ENG MASTERS..... OFF  
 APU MASTER SW..... OFF

**AFTER DITCHING**  
 ATC (VHF 1).....NOTIFY  
 FIRE pushbutton (ENG and APU).....PUSH  
 AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
 EVACUATION..... INITIATE  
 ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*



## ENG DUAL FAILURE - NO FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THRUST LEVERS..... IDLE  
FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....220 KT/GREEN DOT

*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1 /ATC1.....USE

ATC.....NOTIFY

CREW OXY MASKS (Above FL 100).....ON

CABIN AND COCKPIT.....PREPARE

SIGNS.....ON

COMMERCIAL.....OFF

USE RUDDER WITH CARE

### ● WHEN BELOW FL 150

RAM AIR.....ON

## COMMON ACTIONS FOR THE APPROACH

### APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).

BARO.....SET

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

## IF FORCED LANDING ANTICIPATED

### APPROACH

FOR LDG.....USE FLAP 3

*Only slats extend, and slowly.*

MIN APPR SPEED.....150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**


ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

  - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT





ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF


AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

## ENG RELIGHT (IN FLIGHT)

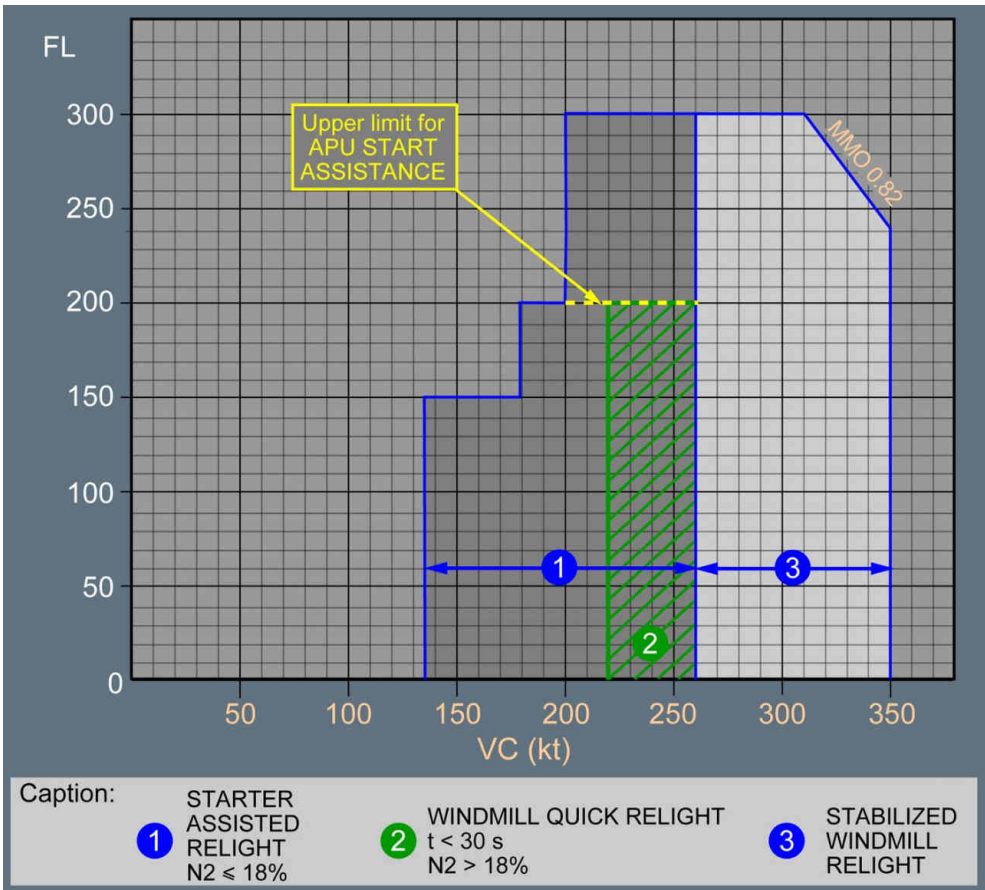
- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.

Engine light up should be achieved within 30 s after fuel flow increases.

- **When idle is reached (AVAIL indication pulses in green) :**
- |                                                                                                       |             |
|-------------------------------------------------------------------------------------------------------|-------------|
| ENG MODE SEL.....                                                                                     | NORM        |
| TCAS MODE SEL  ..... | check TA/RA |
- Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.
- |                   |         |
|-------------------|---------|
| Affected SYS..... | RESTORE |
|-------------------|---------|

- **If no relight :**
- |                            |     |
|----------------------------|-----|
| ENG MASTER (affected)..... | OFF |
|----------------------------|-----|
- Wait 30 s before attempting a new start (to drain the engine).





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
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MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

- When burning has stopped :  
MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF


ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

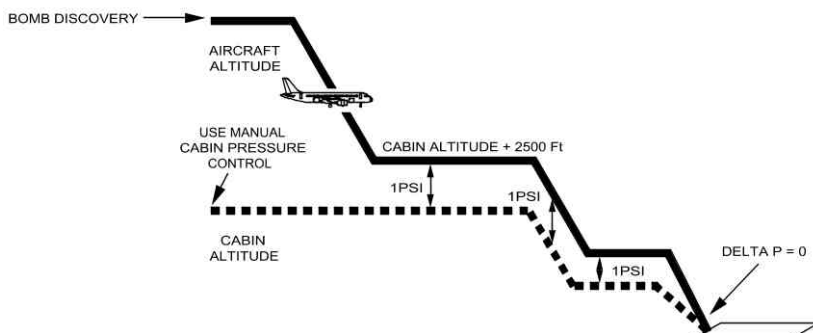
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN





BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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BOMB ON BOARD (Cont'd)

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

*The cabin crews must command passengers to switch off all portable electronic devices.*

BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

● If the bomb can be moved:

RH AFT CABIN DOOR SLIDE..... DISARM

LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

CAUTION

DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

BOMB INDICATION LINE..... POSITION

*Note:* *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

BOMB..... MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

CAUTION

Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.





## BOMB ON BOARD (Cont'd)

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

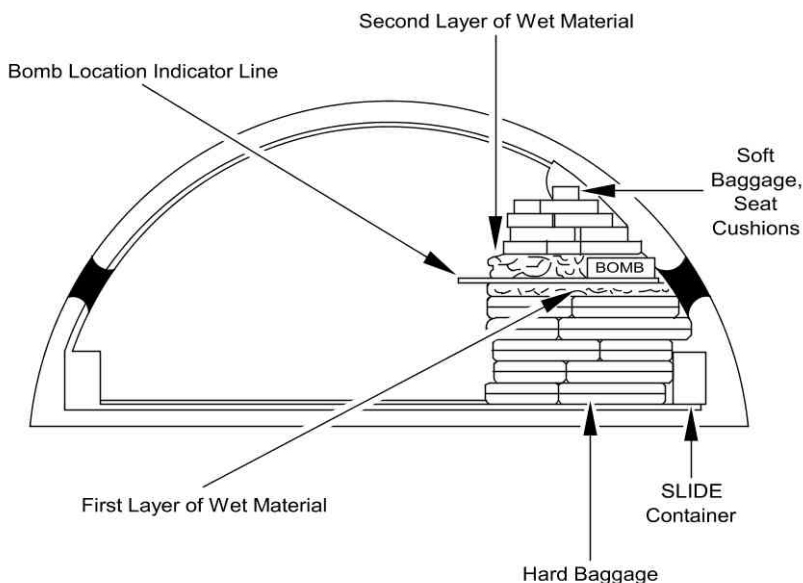
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



PASSENGERS.....MOVE/ADVISE


*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
<i>Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".</i>		
<i>Use all available airport facilities to disembark without delay.</i>		



## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT.....ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE



	FORCED LANDING (Cont'd)	
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ELT..... CHECK EMITTING <i>If not, switch on the transmitter.</i>		
■ <b>If Evacuation not required:</b>		
CABIN CREW and PASSENGERS (PA)..... NOTIFY		

## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


### WHEN DESCENT ESTABLISHED

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

<b>CAUTION</b>	<i>Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.</i>
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*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: *The recommendation is to descend with the autopilot engaged.  
 Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*



OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.

Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown

REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								

## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**  
*This will reduce angle of attack*

*Note:     In case of lack of pitch down authority, reducing thrust may be necessary.*

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

*Note:     In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

**SPEEDBRAKES..... CHECK RETRACTED**  
**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

*Note:     If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**  
**BANK..... WINGS LEVEL**

*Note:     When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.*

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.  
Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- **If the aircraft enters a volcanic ash cloud:**

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
PACK FLOW.....	HI

*Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.*

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

*If airspeed is unreliable or lost, Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.*

*Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed. In case of engine failure, switch off the wing anti ice before engine restart.*

*Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

*Due to the increased noise level, pay particular attention to visual warnings.*



## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.





## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*


Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

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<b>WINDSHIELD/WINDOW ARCING</b>		
<p>Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL</p> <p><i>Pull the circuit breaker of the affected window/windshield heating system, in case of :</i></p> <ul style="list-style-type: none"><li>- <i>Electrical arcing of the cockpit windshield/window, or</i></li><li>- <i>Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.</i></li></ul> <p><i>On the rear C/B panel :</i></p> <ul style="list-style-type: none"><li>• ANTI ICE L WSHLD C/B AF10 (123VU)</li><li>• ANTI ICE R WSHLD C/B AF03 (123VU)</li><li>• ANTI ICE/WINDOWS L C/B X14 (122VU)</li><li>• ANTI ICE/WINDOWS R C/B W14 (122VU)</li></ul>		





## WINDSHIELD/WINDOW CRACKED

**DIAGNOSIS OF INNER PLY.....PERFORM**

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

**MAX FL.....230/MEA**

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

**CAB PRESS MODE SEL.....MAN**

**MAN V/S CTL.....AS RQRD**

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


**CAB PRESS MODE SEL.....AUTO**

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

**CAB PRESS MODE SEL.....MAN**

**MAN V/S CTL.....FULL UP**

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>
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SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
OXY	Cockpit oxygen bottle pressure < 600 PSI.	If mask is not being used, check if it is correctly stowed.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).



## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION

$$VAPP = VREF + \Delta VREF + APPR COR$$

=

VREF												
Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78	
VREF (KT) = VLS CONF FULL	CG < 25%	108	113	118	123	127	131	136	140	144	148	149
	CG ≥ 25%	106	111	116	121	125	129	134	138	142	146	147

+

$\Delta VREF^{(1)}$
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+

APPRoach CORrection		
if $\Delta VREF \leq 10$ kt	if $10 \text{ kt} < \Delta VREF < 20$ kt	if $\Delta VREF \geq 20$ kt
APPR COR is the Highest of		
5 kt * if A/THR ON and / or in case of ice accretion**	1/3 Headwind Max = 15 kt	APPR COR = 1/3 Headwind Max = 10 kt
APPR COR + $\Delta VREF$ limited to 20 kt		APPR COR = 0 kt

\* Multiply the landing distance by an additional factor of 1.1

\*\* In CONF3, add another 5 knot speed increment and multiply the landing distance by an additional factor of 1.2 (instead of 1.1)

=

$$VAPP = VREF + \Delta VREF + APPR COR$$

TO BE INSERTED IN THE MCDU PERF APPR PAGE

(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:


Failure : ALTN LAW  
Flight Conditions : Autothrust ON, ice accretion  
Landing Configuration : CONF 3  
Headwind : 12 kt  
Landing Weight/CG : 48 t/25 %  
VREF determined from the landing weight : 116 kt  
VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt}/3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136 \text{ kt}$$

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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors "WITHOUT REV"** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors "WITH REV"** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note: *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column ("WITH REV." or "WITHOUT REV.")
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:


FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
	3	10			1.40×1.90×1.1=3.00
RESULT	3	10			

$VREF = 131\text{ kt.}$  Therefore  $VAPP = 131 + 10 + 5 = 146\text{ kt.}$

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FAILURES	Flaps Lever Position for Landing	$\Delta$ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S $\geq$ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



*Continued from the previous page*

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	if there is ice accretion				
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	2.30 2.45	1.90 2.05
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	2.40 2.55	2.35 2.50
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	DUAL IR FAULT/DUAL ADR FAULT	3	10	1.35*	1.30*
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*





*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	2.25 2.45	1.70 1.85
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	2.40 2.60	2.30 2.50
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.10 1.20
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
NAV	IR 1+2+3 FAULT	3	10	1.85	1.85
	DUAL IR FAULT/ DUAL ADR FAULT	3	10	1.35*	1.20*
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.00* 1.35*	1.90* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL


<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(f)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*



*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	3.35 3.90	1.60 1.75
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	3.45 3.95	3.30 3.65
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
NAV	IR 1+2+3 FAULT	3	10	1.45	1.45
	DUAL IR FAULT/DUAL ADR FAULT	3	10	1.30*	1.10
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.


<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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COMPUTER RESET TABLE
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B Y 17 on 122VU</li><li>- Wait 1 s before pushing the C/B.</li></ul>
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B Y 17 on 122VU</li><li>- Wait 1 s before pushing the C/B.</li></ul>
	AIR PACK 1(2) REGUL FAULT	ACSC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B W21 and W22 on 122VU</li><li>- Pull C/B X21 and X22 on 122VU</li><li>- Pull C/B Y18, Y20 and Y21 on 122VU</li><li>- Pull C/B D8 on 49VU</li><li>- Wait 5 s before pushing all the C/Bs.</li></ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	AUTO FLT FCU 1(2) FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>







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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>







*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT and/or Loss of Passenger Address and/or Loss of Cabin Interphone	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: P13  and P14  on 121VU, G01 and G02 on 49VU, M05 and M06 on 121VU.</li> <li>- Wait 10 s, then:</li> <li>- Push the C/B in the following order: M05, M06, G01, G02, P13 , P14 .</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M06 on 121VU.</li> </ul> </li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M05 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M06, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: H01 on 49VU, Q14 on 121VU.</li> <li>- Wait 10 s, then:</li> <li>- Push the C/Bs in the following order: Q14, H01.</li> </ul>
24	GPU cannot be connected to the aircraft	GAPCU	<p><b>On ground only:</b></p> <p>The GPU cannot be connected to the electrical network of the aircraft (AVAIL light is OFF):</p> <ul style="list-style-type: none"> <li>• If at least one power source (IDG 1 or 2, APU GEN or batteries) is connected to the electrical network of the aircraft. <ul style="list-style-type: none"> <li>- Reset the EXT PWR pb on 35VU (Press and release)</li> </ul> </li> <li>• If no power source is connected to the electrical network of the aircraft. <ul style="list-style-type: none"> <li>- Set the BAT 1 pb-sw and BAT 2 pb-sw to AUTO.</li> </ul> </li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
26	SMOKE DET FAULT	CIDS-SDF	<b><u>On ground or in flight:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C05 and C06 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>
	SMOKE LAVATORY DET FAULT with all lavatories declared inoperative on the FAP	CIDS or CIDS-SDF	<b><u>On ground or in flight:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs P13 and P14  on 121VU, G01 and G02 on 49VU, M05 or M06 or M07 on 121VU.</li> <li>- Wait 5 s, then</li> <li>- Push the C/Bs in the following order: M05 or M06 and M06 or M07 on 121VU, G01 and G02 on 49VU, P13 and P14  ; on 121VU.</li> </ul> <b><u>If unsuccessful, on ground only:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C06 and C05 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>
	SMOKE FWD (AFT) CARGO DET FAULT SMOKE FWD (AFT) CRG 1 / 2 BTL FAULT	CIDS-SDF	<b><u>On ground:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C05 and C06 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>





*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><b>Note:</b></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the 3 C/B:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li><li>• Channel 1 and 2 (L26 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the 3 C/B.</li></ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	BRAKES SYS 1(2) FAULT or BRAKES BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><u>Note:</u>    After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>    After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	WHEEL N.W STEER FAULT or WHEEL N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>    After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	L/G LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:             <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:             <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<u>On ground only:</u> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
	ISIS malfunction	ISIS	<u>On ground only:</u> With aircraft not moving: <ul style="list-style-type: none"> <li>- Pull C/B F12 on 49VU,</li> <li>- Wait 5 s, then push the C/B,</li> <li>- Normal operation is expected after approximately 2 min.</li> </ul> <p><u>Note:</u>     <i>In the case of small aircraft motion during the C/B reset (refueling, cargo loading conditions, etc.), the ATT red flag may appear on the ISIS. In this case, press the RST P/B for 2 s, and wait 2 min to recover normal operation.</i></p>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus. <p><u>On ground, or in flight:</u></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

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# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strokes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits: AUTOLAND and MANUAL LAND (HWC30 / TWC10 / XWC20)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## **RNAV (GNSS) / RNAV (RNP) APPROACH**

### **● APPROACH PREPARATION**

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### **● APPROACH GUIDANCE**

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### **● AFTER COMMENCING APPROACH: NAVIGATION ALERTS**

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

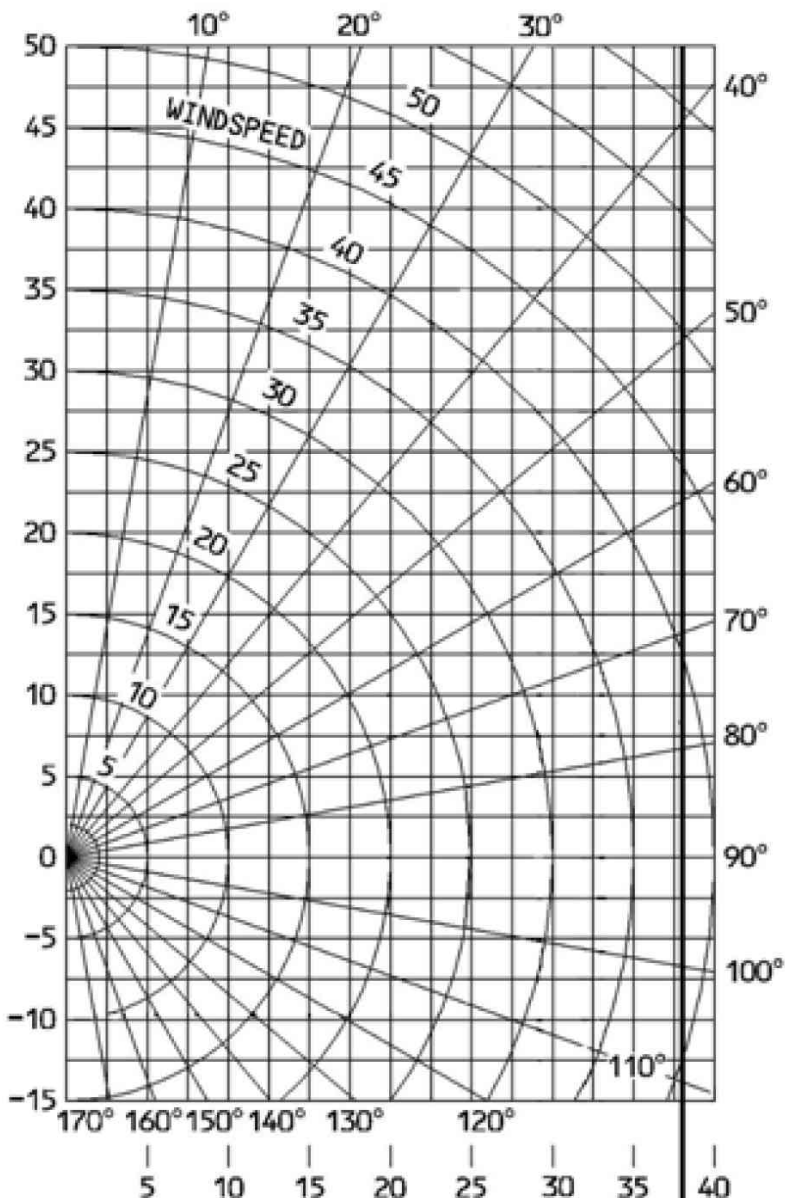
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

CAT II Autoland  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320E

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT		01	
	EMER ELEC CONFIG		08		if there is ice accretion			
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		BRK RELEASED		02	
			S ≥ 1		03	ALTN L(R) RELEASED if NORM BRK FAULT		03
	1 ≤ FLAPS < 2	S < 1	04		ALTN L(R) RELEASED if G SYS LO PR		04	
			S ≥ 1		05	NORM BRK FAULT		05
	2 ≤ FLAPS < 3	S < 1	06		NORM + ALTN BRK FAULT		06	
			S ≥ 1	07	NAV	IR 1+2+3 FAULT		01
	FLAP = 3	S < 1	08	DUAL IR FAULT/DUAL ADR FAULT		02		
		1 ≤ S ≤ 3	09	ALL ADR OFF		03		
		S > 3	10	BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01	
	FLAP > 3	S < 1	11		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	12			REV UNLOCK with buffet (CONF 3)		02
		S > 3	13	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	COMPANY PROCEDURES	CP-FAIL <b>2/2</b>
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**IN FLIGHT PERFORMANCE**

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SPEEDS

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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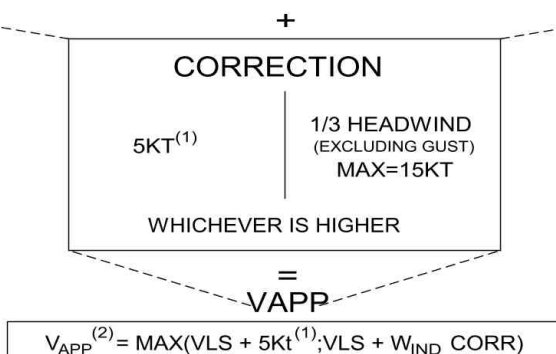


## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

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**LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3**

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600
CORRECTION ON ACTUAL LANDING DISTANCE											
RUNWAY CONDITION	dry runway	wet runway	runway covered with								
			standing water	slush		compacted snow	ice				
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %		+4 %	+5 %				
per 10 kt headwind	No correction for headwind due to wind correction on approach speed										
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %		+16 %	+24 %				
forward C.G.	+2 %	+3 %	+3 %	+3 %		+3 %	+3 %				
2 reversers operative	-5 %	-12 %	-15 %	-14 %		-12 %	-27 %				
Per 5 kt speed increment (and no failure) add 8 % (all runways)											

Note:    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
 Pressure altitude correction: 3 x 2 = +6 %  
 Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 x 1.06 x 1.08 = 1 020 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:*    - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING

- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING

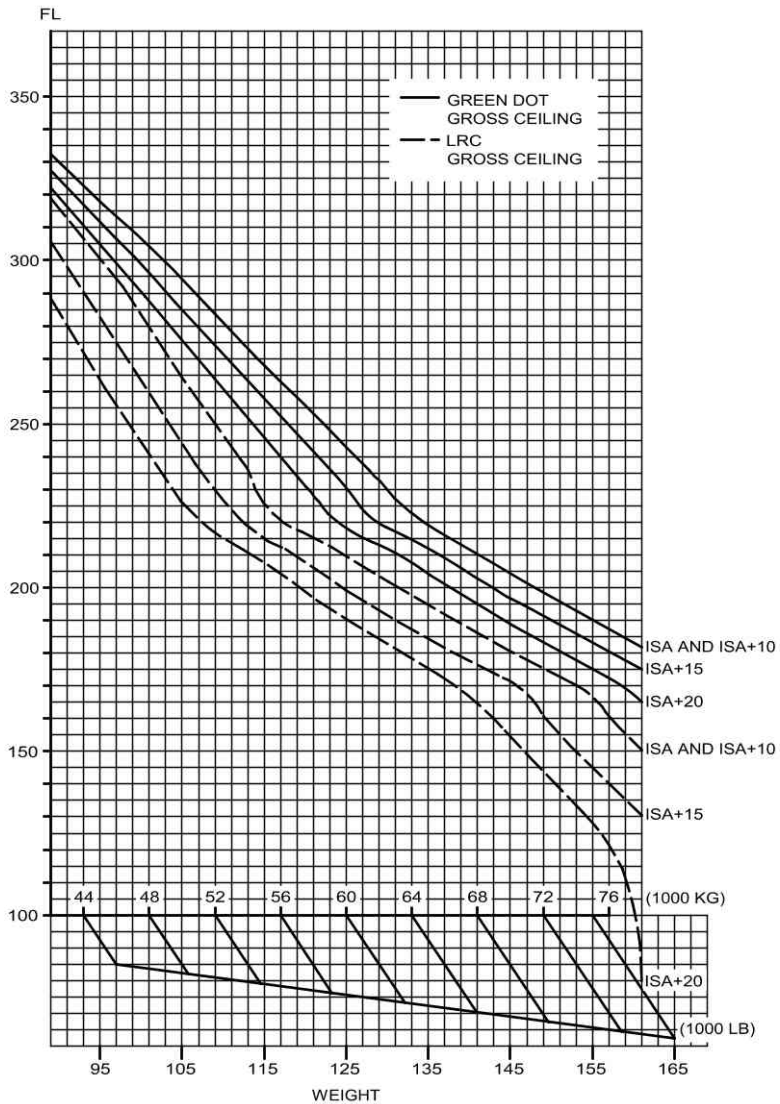
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).



## CEILINGS

### ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT											
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)			
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)			
ANTI ICE OFF				LEVEL OFF (FT)							
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL										
	250	290	310	330	350	370	390				
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200				
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300				
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200				
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200				
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600				
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100				
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800				
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400				
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100				
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600				
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000					
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400					
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800					
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200					
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600						
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON					
FUEL		+ 14 %				+ 28 %					
TIME		+ 13 %				+ 26 %					
DISTANCE		+ 12 %				+ 23 %					
LEVEL OFF		- 700 ft				- 1800 ft					



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## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT								
MAX. CONTINUOUS THRUST LIMITS			ISA	EPR		MACH		
PACK FLOW HI			CG=33.0%	FUEL FLOW (KG/H)		IAS (KT)		
ANTI-ICING OFF								
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250		
50	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584		
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241		
52	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594		
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246		
54	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602		
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249		
56	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600		
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248		
58	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585		
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242		
60	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562		
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232		
62	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570			
	2434 285	2287 272	2225 266	2248 268	2055 246			
64	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544			
	2454 284	2382 279	2317 272	2272 267	2037 234			
66	1.243 .513	1.322 .556	1.397 .591	1.421 .585				
	2476 284	2432 281	2399 277	2264 263				
68	1.247 .512	1.330 .558	1.412 .599	1.426 .570				
	2499 283	2472 282	2473 280	2253 256				
70	1.254 .514	1.338 .560	1.426 .604	1.436 .543				
	2550 285	2516 283	2537 283	2232 243				
72	1.262 .517	1.351 .567	1.428 .598					
	2604 287	2592 286	2533 280					
74	1.270 .521	1.365 .575	1.432 .587					
	2666 289	2673 290	2523 274					
76	1.290 .539	1.381 .585	1.438 .571					
	2805 299	2767 296	2509 267					
78	1.308 .554	1.395 .593	1.450 .537					
	2927 307	2850 300	2478 250					
ENGINE ANTI ICE ON				TOTAL ANTI ICE ON				
△FUEL = + 2.5 %				△FUEL = + 6 %				

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## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG PACK FLOW HI ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)  TIME (H.MIN)			
AIR	DIST. FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
(NM)							100	150	200
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %					TOTAL ANTI ICE ON △FUEL = + 6 %				

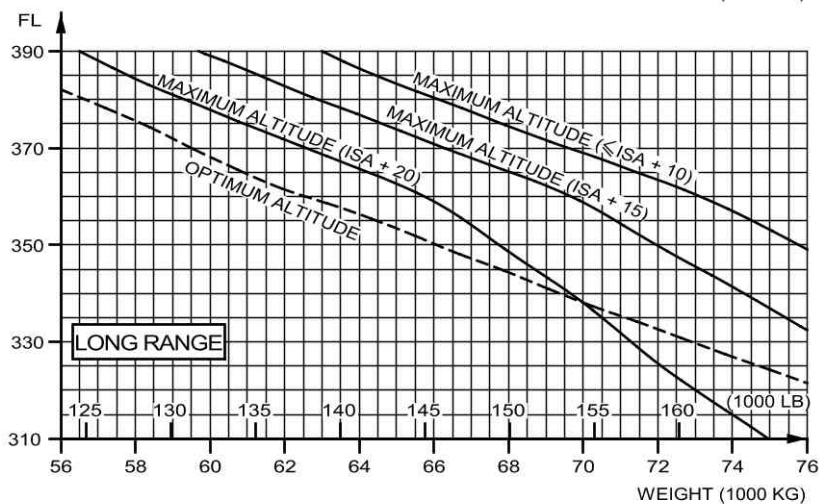
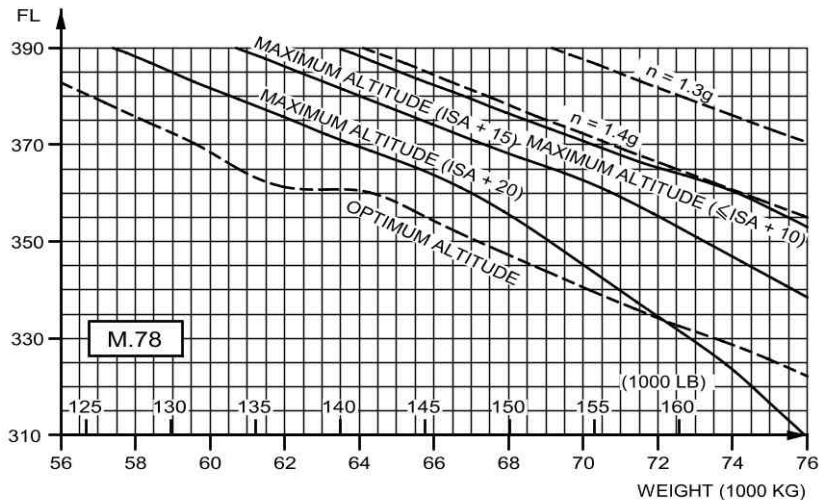
PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NO-04-08-140





## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
≤ ISA + 10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA + 15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA + 20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

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## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

**ALL ENGINES**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
							TIME (H.MIN)		
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	290	310	330	350	370	390	(KG/1000KG)		
	FL290	FL330	FL370						
	FL310	FL350	FL390						
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING ΔFUEL = - 0.4 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %			TOTAL ANTI ICE ON ΔFUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP

CL-NQ-04-10-140

## COST INDEX FOR LONG RANGE CRUISE SPEED

**ALL ENGINES**

For a quick determination of the  $CI_{LRC}$ , use:

- $CI_{LRC} = 40$  kg/min in the FMGC.
- or
- $CI_{LRC} = 55$  (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									IAS (KT)
	45				65				
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 3 %			ΔFUEL = + 7 %			

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# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

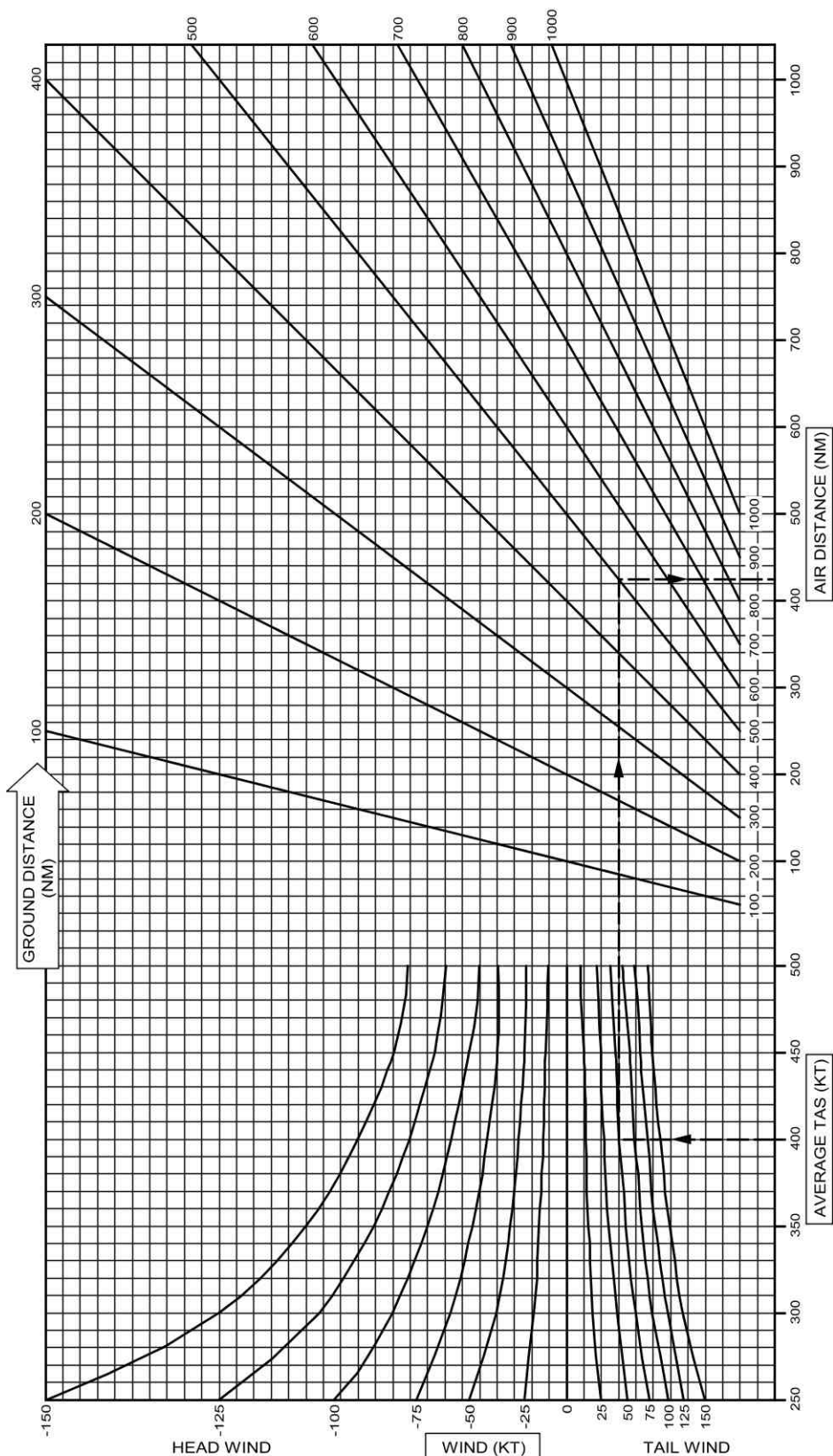
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING ANTI-ICING OFF		ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46
260	1870 1.03	1936 1.00	2004 0.99	2074 0.97	2148 0.95	2222 0.92	2277 0.90
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.98	2396 0.95	2456 0.93
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.99	2634 0.96
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.99
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35
AIR CONDITIONING OFF △FUEL = - 1.5 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 6 %		

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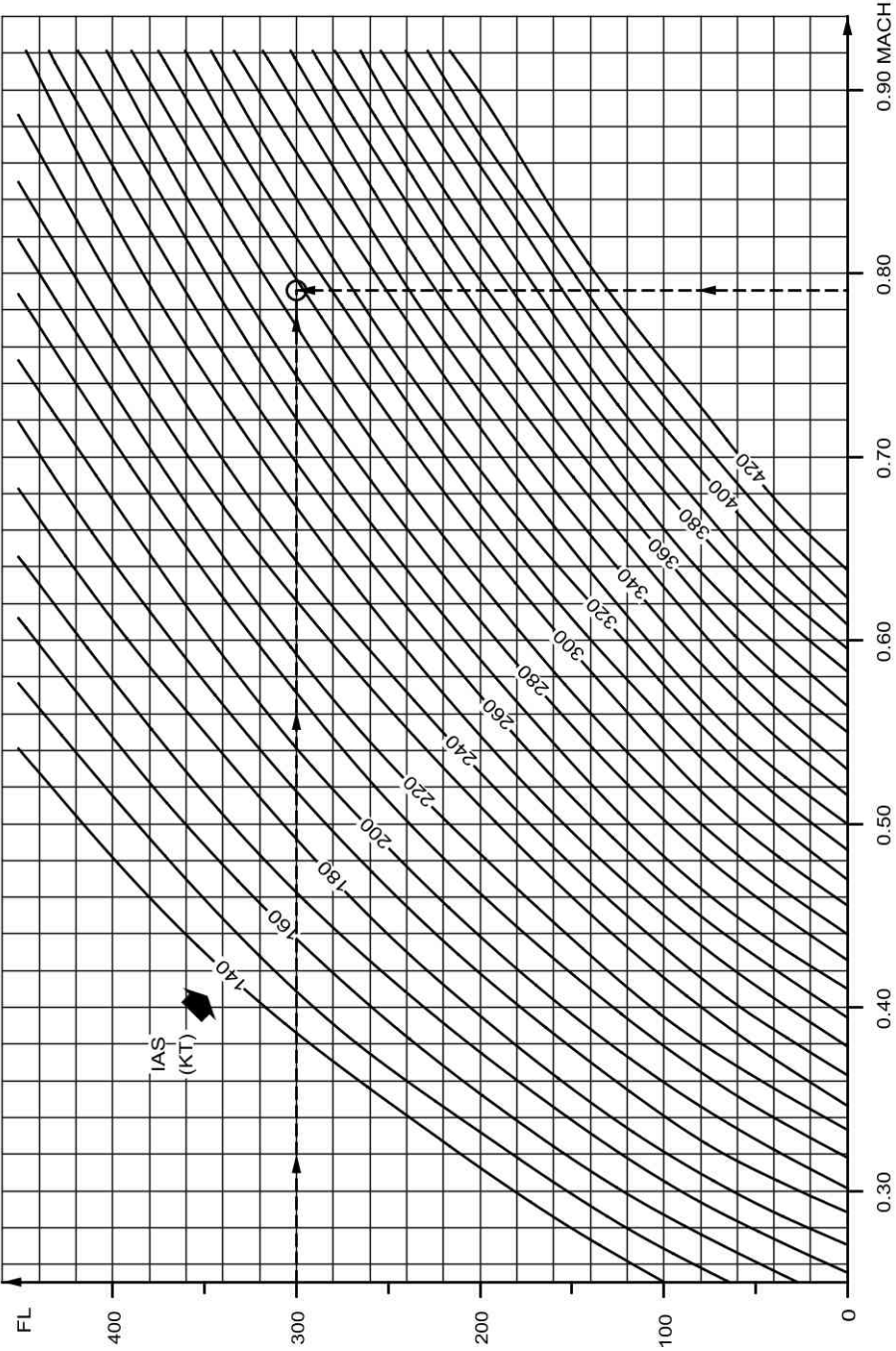
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: *In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.*

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$
 This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$
 This additional fuel must be added to the fuel predictions provided by the FMS.

Note: *Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:*

- *Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or*
- *If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.*

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

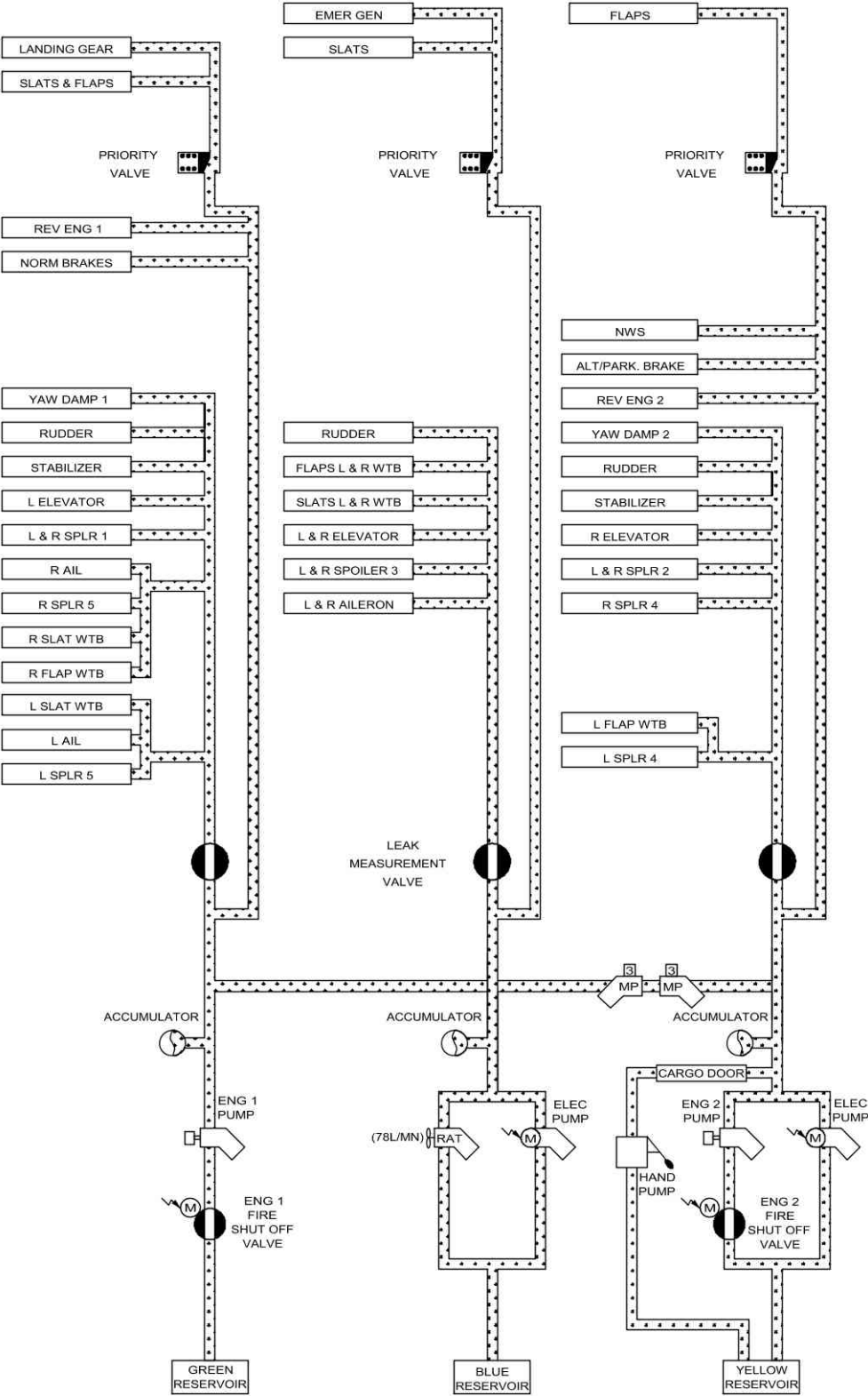
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

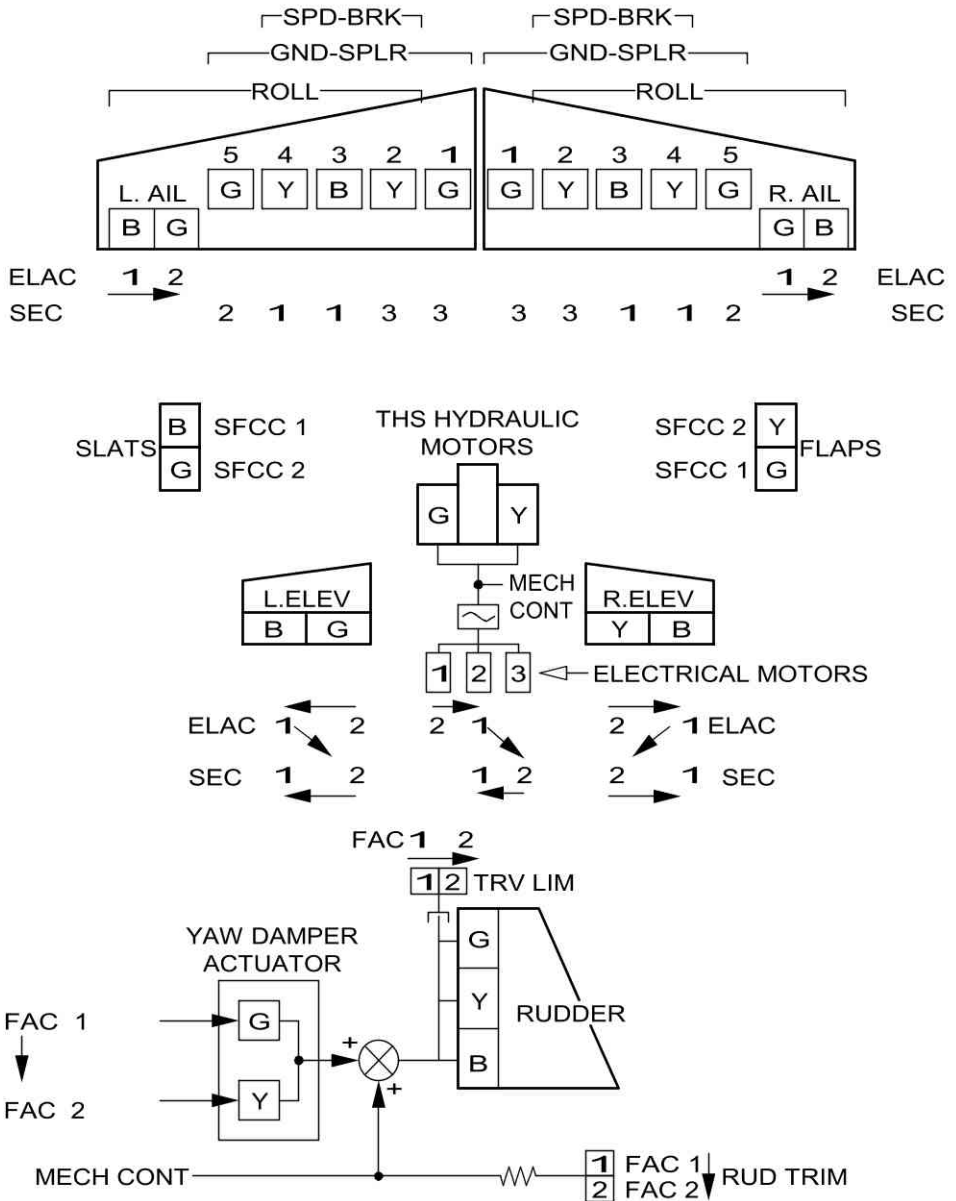
A/THR in managed speed.....USE

HYDRAULIC ARCHITECTURE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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## **OEBPROC-PLP PRELIMINARY PAGES**

<b>TABLE OF CONTENTS.....</b>	<b>1/2</b>
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## **OEBPROC-17 Dual FM Reset upon Radial Fix Info Entry**

<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.00</b>
<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.01</b>

## **OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.00</b>
<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.01</b>

## **OEBPROC-36 No SRS Engagement During Go Around in the Case of EPR Mode Fault**

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.00</b>
<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.01</b>

## **OEBPROC-38 Erroneous Radio Altimeter Height Indication**

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.00</b>
<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.01</b>

## **OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**


<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.00</b>
<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.01</b>

## **OEBPROC-43 F/CTL SPOILER FAULT**

<b>F/CTL SPOILER FAULT.....</b>	<b>43.00</b>
<b>F/CTL SPOILER FAULT.....</b>	<b>43.01</b>

## **OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

<b>L/G GEAR NOT DOWNLOCKED.....</b>	<b>44.00</b>
<b>■ L/G GEAR NOT DOWNLOCKED ■.....</b>	<b>44.01</b>

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		17.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSP				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HSP				



## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

*Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).*

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSP				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HSP				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB36 Issue 1.0

### NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		36.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSP					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSP					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

Action performed by the PNF on PF request.

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

Rotate to 12.5 ° in case of engine failure.

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSP				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSP				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSP				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSP				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



<b>AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)</b>
--------------------------------------------------------------------------------

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).



## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSP				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSP				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>44.00</b> 30 MAR 12
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## OEB44 Issue 2.0

# L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSP				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSP				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	<b>BLANK</b>
		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSQ**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>		<b>1/2</b>
			30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Identification</b>	<b>T<sup>(2)</sup></b>	<b>E<sup>(3)</sup></b>	<b>Rev. Date</b>	<b>Title</b>
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSQ</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HSQ</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSQ</b>				
	OEB41 issue 1.0	W	N	30 MAR 12	Erroneous Alternate Fuel Predictions Upon Modification of a Company Route in the Alternate Flight Plan
	Criteria: P10763 <b>Applicable to: B-HSQ</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSQ</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSQ</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12


<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-41	Erroneous Alternate Fuel Predictions Upon Modification of a Company Route in the Alternate Flight Plan	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	1/2
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-31	<b>MULTIPLE UNDUE ECAM ALERTS</b>	00013755.0001001	30 MAR 12
	Criteria: 31A1220, 31-1276, P8671, P9824 <b>Applicable to: B-HSQ</b> Impacted DU: NONE <u>Reason for issue:</u> This Temporary Revision is issued to give a procedure to the crew in the case of multiple suspected undue ECAM alerts.			

	ABN-80	<b>Computer Reset Table</b>	NG00824	
	ABN-80	<b>Computer Reset Table - 21 - Air Conditioning/Ventilation/Pressurization</b>	00013738.0001001	30 MAR 12
	Criteria: K10463 <b>Applicable to: B-HSQ</b> Impacted DU: NONE			
	ABN-80	<b>Computer Reset Table - 23 - Communications</b>	00013850.0024001	30 MAR 12
	Criteria: K12824, K12825, K3901, K8400, SA <b>Applicable to: B-HSQ</b> Impacted DU: 00010910 Computer Reset Table - 23 - Communications <u>Reason for issue:</u> CIDS Director Hardware 333B and On Board Replacement Module (OBRM) 33A are sensitive to short power supply interruptions. These power supply interruptions occur when the aircraft is supplied by external power. As a consequence, ECAM caution "COM CIDS 1+2 FAULT" or CIDS Maintenance status 'CIDS 1' or 'CIDS 2' could be spuriously triggered. In such event, the flight crew should verify that the CIDS is functioning normally by checking the PA, Cabin Interphone and Cabin lighting function. If the ECAM caution is spurious, it can be removed by resetting the CIDS when the aircraft is powered by the APU.			
	ABN-80	<b>Computer Reset Table - 27 - Flight Controls</b>	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSQ</b> Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls <u>Reason for issue:</u> This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	5024		B-HSQ	320-232


(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
		30 MAR 12


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			

 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>2/6</b>
		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	Applicable to: ALL			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	Applicable to: ALL			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	Applicable to: ALL			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	Applicable to: ALL			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	Applicable to: ALL			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	Applicable to: ALL			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	Applicable to: ALL			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	Applicable to: ALL			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	Applicable to: ALL			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	Applicable to: ALL			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	Applicable to: ALL			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	Applicable to: ALL			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	Applicable to: ALL			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	Applicable to: ALL			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	Applicable to: ALL			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	Applicable to: ALL			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	Applicable to: ALL			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	Applicable to: ALL			




M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	<b>Applicable to: ALL</b>			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	<b>Applicable to: ALL</b>			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	<b>Applicable to: ALL</b>			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	<b>Applicable to: ALL</b>			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	<b>Applicable to: ALL</b>			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	Applicable to: ALL			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	Applicable to: ALL			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	Applicable to: ALL			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	Applicable to: ALL			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	Applicable to: ALL			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	Applicable to: ALL			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	Applicable to: ALL			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	Applicable to: ALL			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	Applicable to: ALL			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	Applicable to: ALL			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	Applicable to: ALL			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	Applicable to: ALL			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	Applicable to: ALL			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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**GEN-PLP PRELIMINARY PAGES**

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Important..... GEN.01

Use of Summaries..... GEN.02

General Information..... GEN.03

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IMPORTANT		

### **SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
 As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

### **TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

#### **PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

#### **PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

### **Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

### **ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

### **ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.



## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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## **ABN-PLP PRELIMINARY PAGES**

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## **ABN-21 Air Conditioning/Ventilation/Pressurization**

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## **ABN-22 Auto Flight**

<b>LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset).....</b>	<b>22.01</b>
<b>LOW ENERGY WARNING.....</b>	<b>22.02</b>

## **ABN-24 Electrical**

<b>ELEC EMER CONFIG SYS Remaining.....</b>	<b>24.01</b>
<b>ELEC EMER CONFIG Summary.....</b>	<b>24.02</b>

## **ABN-25 Equipment**

<b>COCKPIT DOOR FAULT.....</b>	<b>25.01</b>
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## **ABN-26 Fire Protection**

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<b>SIDESTICK/RUDDER PEDALS STIFF.....</b>	<b>27.03</b>
<b>RUDDER JAM.....</b>	<b>27.04</b>
<b>STABILIZER JAM.....</b>	<b>27.05</b>

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<b>HYD G + B SYS LO PR Summary.....</b>	<b>29.02</b>
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■ TCAS WARNINGS ■.....	34.06
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**CABIN OVERPRESSURE**

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.
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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered (i.e. when the FMGC prompt is available and selectable on the MCDU MENU page)

- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The “CAB PR LDG ELEV FAULT” message is displayed on the ECAM
- A “MAP NOT AVAIL” message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.


Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>				
<b>ELEC EMER CONFIG SYS REMAINING</b>		<b>EMER GEN RUNNING</b>	<b>BAT ONLY</b>	
			<b>IN FLIGHT</b>	<b>ON THE GROUND</b>
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1+ N° 2	N° 1+ N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	ABCU	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



*Continued from the previous page*

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	ISIS	Norm	Norm	Norm
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a) Restored, when speed is below 100 kt.

(b) Crew oxygen valve inoperative.


(c) Lost, when speed is below 50 kt.

(d) Lost 30 s after last engine shutdown.

(e) IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f) For APU start only.

(g) Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
DRY Runway	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
 In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:


COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT..... ON
- If fuel vapors:**
- CAB FANS.....ON  
 PACK 1+2..... OFF
- If no fuel vapors:**
- CAB FANS..... OFF  
 PACK FLOW..... HI
- LDG ELEV..... 10 000 FT/MEA  
 DESCENT (FL 100, or MEA, or minimum obstacle  
 clearance altitude)..... INITIATE  
 ATC..... NOTIFY  
 SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE
- While descending, continue applying the appropriate  
 steps of the SMOKE/FUMES/AVNCS SMOKE  
 procedure depending on the suspected smoke source.*
- At FL 100 OR MEA:**
- APU MASTER SW (if in ELEC EMER CONFIG)... ON  
 PACK 1+2..... OFF  
 MODE SEL.....MAN  
 MAN V/S CTL..... FULL UP  
 RAM AIR.....ON  
 APU MASTER SW.....OFF
- If smoke persists, open CKPT window:**
- MAX SPEED.....200 KT  
 COCKPIT DOOR.....OPEN  
 HEADSETS..... ON  
 PNF COCKPIT WINDOW..... OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMERG
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT.....ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATE:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL.....CONSIDER  
 ELEC EMER CONFIG.....CONSIDER  
*Refer to the end of the procedure to Set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING.....CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

- **IF AIR COND SMOKE SUSPECTED:**  
 APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 PACK 1..... OFF  
 ● **If smoke continues:**  
 PACK 1..... ON  
 PACK 2..... OFF  
 ● **If smoke still continues:**  
 PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ● **IF CAB EQUIPMENT SMOKE SUSPECTED:**  
 ● **If smoke continues:**  
 EMER EXIT LIGHT..... ON  
 COMMERCIAL..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE  
 ● **If smoke still continues or if faulty  
equipment confirmed isolated:**  
 COMMERCIAL..... NORM  
 SMOKE/FUMES REMOVAL..... CONSIDER





## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

#### ● WHEN EMER GEN AVAIL:

APU GEN.....OFF  
GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

#### ● AT 3 min OR 2 000 ft AAL BEFORE LANDING:

GEN 2..... ON  
EMER ELEC GEN 1 LINE.....ON

#### ● WHEN A/C IS STOPPED:

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt

Note:


- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED


Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
Slats					
S = 0	NO LIMITATION	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1	230 kt				177 kt
S = 1					
1 < S ≤ 3	200 kt		200 kt	185 kt	
S > 3	177 kt		177 kt	177 kt	177 kt

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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<b>SIDESTICK/RUDDER PEDALS STIFF</b>		
<p>Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:</p> <ul style="list-style-type: none"><li>- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or</li><li>- One sidestick and the rudder pedals at the same time.</li></ul> <p>The piloting technique remains the same: The aircraft remains responsive. However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.</p> <p>AP DISENGAGEMENT.....CONFIRM</p> <p>CONSIDER TRANSFERRING CONTROL TO PNF</p> <p>● <b>FOR DECRAB, ROLLOUT, OR ENGINE FAILURE</b></p> <p>BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL</p>		



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

# STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.  
 AP..... OFF  
 MAN PITCH TRIM.....CHECK  
*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

- IF MAN TRIM AVAIL:**  
 TRIM FOR NEUTRAL ELEV  
*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

## APPR PROC

- IF MAN TRIM NOT AVAIL:**  
 FOR LDG.....USE FLAP 3  
*Do not select configuration full so as not to degrade the handling qualities.*  
 GPWS LDG FLAP 3..... ON  
 CAT 2 INOP

**FUEL IMBALANCE**

FOB..... CHECK  
 Compare the FOB + FU, with the FOB at departure.  
 If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. Refer to ABN-28 FUEL LEAK.
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FUEL X FEED..... ON  
 ● On the lighter side and in the center tank:  
   FUEL PUMPS.....OFF  
 ● When fuel is balanced:  
   FUEL PUMPS (WING + CTR)..... ON  
   FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.
- The destination EFOB turns to amber on the F.PLN (or on the FUEL PRED) page, or
- "DEST EFOB BELOW MIN" appears on the MCDU scratchpad.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

**LAND ASAP**

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

#### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*





FUEL LEAK (Cont'd)

● If leak continues (after engine shutdown):

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.

ENGINE RESTART..... CONSIDER

CAUTION	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:

A leak from the Center tank or the APU feeding line may be suspected.

● If fuel smell in the cabin:

APU (if ON)..... OFF

*This prevents additional fuel loss through the APU feeding line.*

● When fuel quantity in one inner tank is less than 3 t (6 600 lb):

CTR TK PUMP 1+2..... ON

FOR LANDING

CAUTION	Do not use reversers.
---------	-----------------------

GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75								
<b>CONTA runway (CONF 3)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

**HYD G + B SYS LO PR SUMMARY**

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● WHEN SPD 200 KT	
L/G.....	GRVTY EXTN
● WHEN L/G down: USE MAN PITCH TRIM	
For Flaps extension: SPD SEL.....	VFE NEXT- 5KT
When in landing CONF: DECELERATE TO CALCULATED VAPP	

LANDING											
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law											
<b>SPOILERS:</b> Only 2 per wing											
<b>REVERSER:</b> Only N°2											
<b>BRAKING:</b> ALTERNATE											


GO-AROUND											
NO GEAR RETRACTION. Increased fuel consumption											
<ul style="list-style-type: none"> <li>● <b>For circuit:</b></li> <li style="padding-left: 20px;">MAINTAIN SLATS/FLAPS CONFIGURATION</li> <li style="padding-left: 20px;">Recommended speed: MAX SPD - 10 kt</li> <li>● <b>For diversion:</b></li> <li style="padding-left: 20px;">SELECT CLEAN CONFIGURATION</li> <li style="padding-left: 20px;">If Slats at zero: Normal operating speeds</li> <li style="padding-left: 20px;">If Slats not at zero: Recommended speed MAX SPD -10 kt</li> </ul>											

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (*Refer to VAPP Calculation*).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

### APPROACH

CAT 2 INOP
SLATS SLOW / FLAPS JAMMED
GPWS FLAP MODE..... OFF
<b>● For Flaps extension:</b> SPD SEL..... VFE NEXT - 5KT
When in landing CONF : DECELERATE TO CALCULATED VAPP
Stabilize at VAPP before L/G down, to be trimmed for approach.
L/G GRAVITY EXTENSION

### LANDING

<b>FLARE:</b> PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law
<b>SPOILERS:</b> Only 1 per wing
<b>NO REVERSER</b>
<b>BRAKING:</b> BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI
<b>NO NOSEWHEEL STEERING</b>

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt
<b>● For diversion:</b> <b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds <b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV										
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78	
<b>DRY runway</b>	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15									
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10									
<b>CORRECTIONS</b>	+ 1 000 ft above SL					+ 10 kt tailwind				
<b>DRY runway</b>	+ 3 %					+ 18 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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**DOUBLE AOA HEAT FAILURE**

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or INVALID DATA message),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, ECAM DUs or MCDU 1 is(are) affected.

GEN 1 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 1 ..... ON

#### ■ If DUs stop flashing:

GEN 1 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 2 ..... ON

#### ■ If DUs stop flashing:

GEN 2 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ DU is blank (with or without a large letter “F” in amber), or the display is distorted:

DU (affected) ..... AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected) ..... USE

*Transfer SD to the F/O or CAPT ND.*


PFD/ND XFR (if the EFIS DUs are affected) ..... USE

### ■ INVALID DISPLAY UNIT message is displayed:

This may be caused by a DU failure.

FOR AUTOMATIC DU RECOVERY ..... WAIT MORE THAN 40 s



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<b>DISPLAY UNIT FAILURE (Cont'd)</b>		
<div> <div> <ul style="list-style-type: none"> <li>● <b>IF DU IS AUTOMATICALLY RECOVERED:</b> No crew action is required.</li> <li>● <b>IF DU IS NOT RECOVERED:</b> Non-recovered DU..... AS RQRD <i>The DU can be switched off.</i></li> </ul> </div> <div> <p>■ <b>INVALID DATA message appears (not on all DUs):</b> EIS DMC SWITCHING..... AS RQRD</p> <ul style="list-style-type: none"> <li>● <b>If unsuccessful:</b> DU (affected)..... OFF THEN ON</li> </ul> <p><i>Note: The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.</i></p> </div> <div> <p>■ <b>INVALID DATA message appears on all DUs:</b> The autopilot, autothrust and MCDU navigation data are still available, and may be used. FOR AUTOMATIC DUs RECOVERY ..... WAIT MORE THAN 40 s</p> <ul style="list-style-type: none"> <li>● <b>IF ALL DUs ARE AUTOMATICALLY RECOVERED:</b> No crew action is required.</li> <li>● <b>IF ONE OR MORE DUs ARE NOT RECOVERED:</b> Non-recovered DUs..... OFF FOR 40 s Non-recovered DUs..... BACK ON sequentially               <ul style="list-style-type: none"> <li>● <b>If the initial failure re-occurs (INVALID DATA message appears on all DUs), when switching a given DU back ON:</b> Apply the entire procedure again, from the beginning. Leave this specific DU permanently OFF.</li> </ul> </li> </ul> </div> <div> <p>■ <b>INVERSION OF THE EWD AND THE SD:</b> ECAM UPPER DISPLAY ..... OFF THEN ON <i>The same action on the EIS DMC SWITCHING selector produces the same effect.</i></p> </div> </div>		



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

MULTIPLE UNDUE ECAM ALERTS

- In the case of multiple undue ECAM alerts concerning :
- ENG 1(2) N1(N2) (EGT) (FF) OVER LIMIT or
  - ENG 1(2) N1(N2) (EGT) (EPR) (FF) DISCREPANCY or,
  - NAV ATT(ALT) (HDG) DISCREPANCY or,
  - NAV FM/GPS POS DISAGREE or,
  - FUEL F.USED/FOB DISAGREE or,
  - MINIMUM or HUNDRED ABOVE callouts,

possibly associated with EFIS red flags, apply the below procedure :

AFFECTED PARAMETERS..... CROSSCHECK

Crosscheck the affected parameters on the E/WD, PFD, ND or on the related SD page to confirm that the alerts are spurious.

- If it is confirmed that the ECAM alerts are spurious, identify the faulty DMC :  
EIS DMC SWITCH.....CAPT 3  
DMC 3 replaces DMC 1. If the undue alerts stop, DMC 1 is the faulty DMC.
- If unsuccessful :  
EIS DMC SWITCH.....F/O 3  
DMC 3 replaces DMC 2. If the undue alerts stop, DMC 2 is the faulty DMC.

LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

- Note:
1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
  2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
  3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
  4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

Note: The free-fall system may be reset in flights used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed. The flight crew should not reset the free-fall system on the ground after flight.

### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <u>WHEEL</u> SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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**PREPARATION**

CABIN CREW.....	NOTIFY
ATC.....	NOTIFY
GALLEY.....	OFF
<i>Consider fuel reduction to a safe minimum.</i>	
● <b>If NOSE L/G abnormal:</b>	
CG location (if possible).....	AFT
- 10 passengers from front to rear moves the CG roughly 4 % aft.	
- 10 passengers from mid to rear moves the CG roughly 2.5 % aft.	
● <b>If one MAIN L/G abnormal:</b>	
FUEL IMBALANCE.....	CONSIDER
<i>Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.</i>	
OXYGEN CREW SUPPLY.....	OFF
SIGNS.....	ON
CABIN and COCKPIT.....	PREPARE
- Loose equipment secured.	
- Survival equipment prepared.	
- Belts and shoulder harness locked.	

**APPROACH**

GPWS SYS.....	OFF
L/G lever.....	CHECK DOWN
GRVTY GEAR EXTN handcrank.....	TURN BACK TO NORMAL
AUTOBRAKE.....	DO NOT ARM
EMER EXIT LT.....	ON
CABIN REPORT.....	OBTAIN
A/SKID & N/W STRG.....	OFF
MAX BRAKE PR.....	1000 PSI
● <b>If one or both MAIN L/G abnormal:</b>	
GROUND SPOILERS.....	DO NOT ARM

**BEFORE LANDING**

RAM AIR.....	ON
BRACE FOR IMPACT.....	ORDER
● <b>If the external light condition is poor at landing:</b>	
DOME LT.....	DIM

**FLARE, TOUCH DOWN AND ROLL OUT**

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.

Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.







## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*


**ASYMMETRIC BRAKING**

Normal braking is faulty, or the green hydraulic system is in low pressure, and all brakes of one gear are released.

Apply brake progressively on the available side. Counter swing with the rudder.  
Avoid crosswind in excess of 10 knots from the side of the available brake.

- **If only one reverse is available:**  
Do not use Reverse on the side of the available brake.

LDG DIST PROC..... **APPLY**  
*Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables; in case of NORM BRK FAULT or G SYS LO PR.*

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ALL ADR OFF

SPD.....FLY THE GREEN  
*Fly within the green area of the speed scale to ensure safe flight. For slats/flaps retraction, it is better to fly at the top of the green area of the speed scale.*

**CAUTION**    *The altitude displayed on the PFD is a GPS altitude.*

MANUAL CABIN PRESSURE CONTROL

MODE SEL..... MAN  
MAN V/S CTL..... AS RQRD  
MAN CAB PR CTL  
TGT V/S     :    CLIMB 500 ft/min  
                  DESC 300 ft/min

A/C GPS ALT	CAB ALT TGT
410	8000
350	7000
300	5500
250	3000
<200	0

FOR APPROACH

SPD.....FLY THE GREEN  
*Before extending the slats/flaps, it is better to fly at the bottom of the speed scale green area, and to be in straight flight.*


FOR LDG.....USE FLAP 3  
LDG DIST PROC..... APPLY  
*Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables*  
APPR SPD.....FLY THE BUG  
*During the approach, the bug indicates VAPP.*

- **WHEN FLAP 2:**  
LDG GRVTY EXTN.....DOWN  
*All gear doors remain open.*
- **WHEN L/G DOWNLOCKED:**  
L/G lever.....DOWN  
GEAR DOWN indications..... CHECK
- **DURING FINAL APPROACH:**  
MAN V/S CTL.....FULL UP

**CAUTION**    *Check that the outflow valve is fully open and that cabin altitude is at airfield elevation before opening the doors.*


STATUS

INOP SYS

REAC W/S DET  
PRED W/S DET   
F/CTL PROT  
ADR 1+2+3  
RUD TRV LIM  
AP 1+2  
A/THR  
CAB PR 1+2  
GPWS



ALL ADR OFF (Cont'd)

	<div>GPWS TERR </div> <div><u>Other INOP SYS</u></div> <div>RAT automatic extension ATC ALTI MODE TCAS L/G RETRACT</div>
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**NAV FM / GPS POS DISAGREE**

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 ° ,
- 0.9 min for latitudes at or above 55 ° and below 70 ° ,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

● **If the message occurs during ILS/LOC approach (LOC green):**

DISREGARD it.

● **If the message occurs in climb, cruise, or descent:**

CHECK navigation accuracy, using raw data.

■ **If the check is positive:**

NAV mode and ND ARC/ROSE NAV may be used.

■ **If the check is negative:**

HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

■ **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**

Use the associated FD/AP.

■ **If not:**

Deselect GPS and revert to basic information.

● **If the message occurs during a Non Precision Approach (NPA):**

■ **Overlay approach:**

SELECT HDG, or TRK, and use raw data.

■ **GPS or RNAV approach:**

GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.

During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure. Aircraft must stay level with constant speed during 30 s.

MODE SELECTOR..... ATT  
LEVEL A/C ATTITUDE..... HOLD  
CONSTANT A/C SPEED..... MAINTAIN

● MCDU INITIALIZATION:

DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*  
IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*  
A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*





## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS

Respect Stall Warning.  
To monitor speed, refer to IRS Ground Speed or GPS Ground Speed variations.

CAUTION	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

**AFFECTED ADR IDENTIFICATION**

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

- **If at least one ADR is reliable:**

Faulty ADR(s)..... OFF

REMAINING AIR DATA..... CONFIRM

*Alternates sources may be used to evaluate the air data:*

  - GPS altitude.
  - GPS and IRS ground speeds, taking into account altitude and wind effect.

- **If affected ADR(s) cannot be identified, or if all ADRs are affected:**

■ **When above FL 250:**

ONE ADR..... KEEP ON

TWO ADRs..... OFF

*This prevents the flight control laws from using two coherent but unreliable ADR data.*

For flight continuation, *Refer to Climb, Cruise and Descent tables.*

■ **When below FL 250, if speed still unreliable:**

ALL ADRs P/B..... OFF

*All ADRs must be switched OFF to replace the PFD's normal speed scale and altitude indication to the Back Up Speed Scale and GPS altitude indication.*

SPD..... FLY THE GREEN

NAV ADR 1+2+3 FAULT

**CLIMB**

Set the thrust to CL.

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
FL 250 - FL 320	275 kt	4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

**CRUISE**

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
FL 250 - FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

**DESCENT**

Set the thrust to IDLE.



UNRELIABLE SPEED INDICATION/ADR  
CHECK PROC (Cont'd)

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320 - FL 250	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE



## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL225/MEA..... INITIATE

*Descend rapidly to FL 225, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL225 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL225

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 225, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

##### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

##### ■ If ENG 2 BLEED is lost first:

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative:  
X BLEED..... CHECK OPEN  
DESCENT TO FL225/MEA.....CONTINUE  
*Descend rapidly to FL 225, to recover the bleed supply from the APU.*  
APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL225 :  
WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
APU BLEED..... ON  
MAX FL225  
AVOID ICING CONDITIONS
- IF ICE ACCRETION  
APPR SPD.....VLS + 10 KT  
LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**

CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**

APU (IF AVAIL).....START

● **WHEN BELOW FL 200**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172







## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*
  - GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*


ENG DUAL FAILURE - NO FUEL REMAINING

The flight crew should apply this paper procedure and then, if time permits, clear ECAM warnings and check the ECAM STATUS page.

THRUST LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
*Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.*  
 OPTIMUM SPEED.....220 KT/GREEN DOT  
*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*  
 EMER ELEC POWER (if EMER GEN not in line).....MAN ON  
 VHF1/HF1  /ATC1.....USE  
 ATC.....NOTIFY  
 CREW OXY MASKS (Above FL 100).....ON  
 CABIN AND COCKPIT.....PREPARE  
 SIGNS.....ON  
 COMMERCIAL.....OFF  
 USE RUDDER WITH CARE  
 ● **WHEN BELOW FL 150**  
   RAM AIR..... ON

**COMMON ACTIONS FOR THE APPROACH**

**APPROACH PREPARATION**

*Note:*     *Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).*

BARO..... SET  
 CREW MASKS/OXY SUPPLY (below FL 100).....OFF

**IF FORCED LANDING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
 MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**


ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

  - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*


## ENG RELIGHT (IN FLIGHT)

MAX ALTITUDE.....See below  
 ENG MASTER (affected).....OFF  
 THR LEVER (affected)..... IDLE  
 ENG MODE SEL..... IGN  
 X BLEED ..... OPEN  
 WING A. ICE (for starter assist).....OFF  
 ENG MASTER (affected)..... ON

*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*

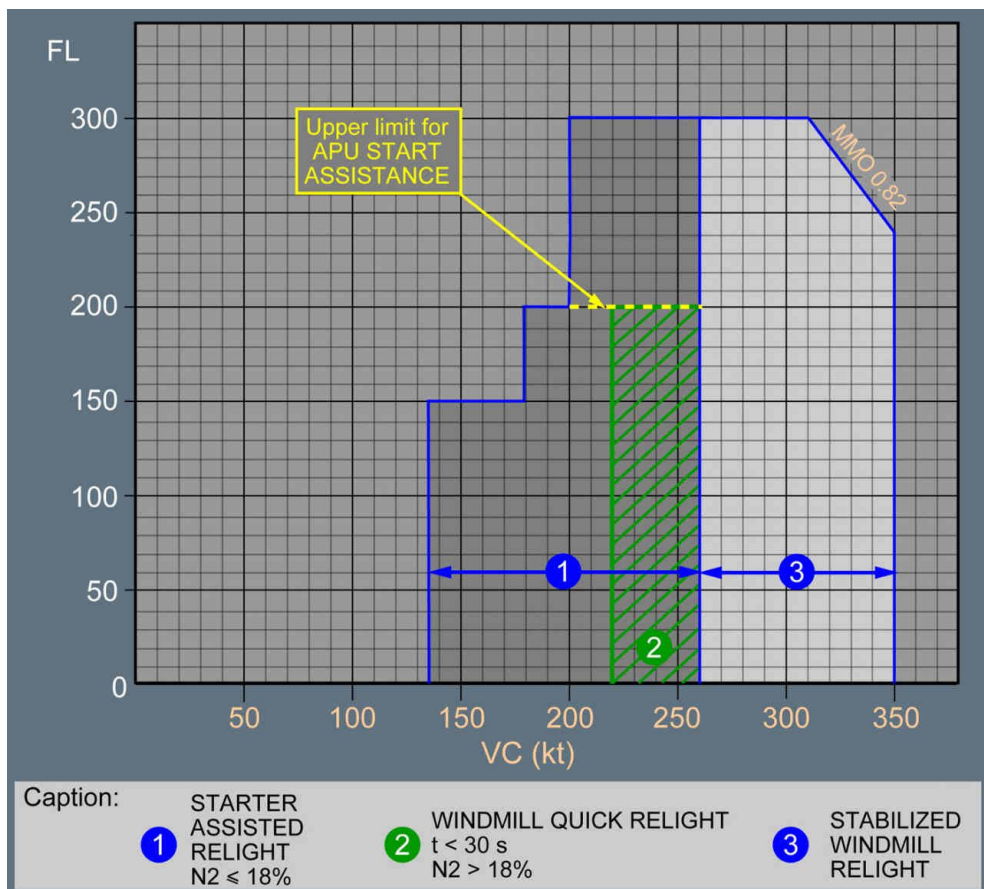
*Engine light up should be achieved within 30 s after fuel flow increases.*

■ **When idle is reached (AVAIL indication pulses in green) :**

ENG MODE SEL..... NORM  
 TCAS MODE SEL  ..... check TA/RA  
*Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*  
 Affected SYS..... RESTORE

■ **If no relight :**

ENG MASTER (affected)..... OFF  
*Wait 30 s before attempting a new start (to drain the engine).*





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
---------	---------------------------------------------------------------------------------------------------------------------------------------------

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

- When burning has stopped :  
MAN START.....OFF  
ENG MODE SEL..... NORM





## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

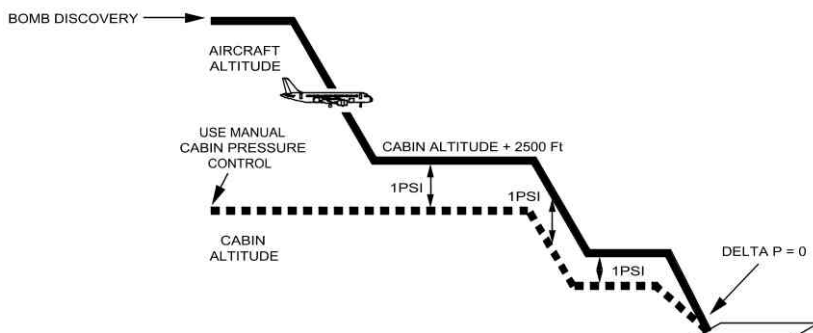
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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BOMB ON BOARD (Cont'd)

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

*The cabin crews must command passengers to switch off all portable electronic devices.*

BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

● If the bomb can be moved:

RH AFT CABIN DOOR SLIDE..... DISARM

LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

CAUTION

DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

BOMB INDICATION LINE..... POSITION

*Note: A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

BOMB..... MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

CAUTION

Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.





## BOMB ON BOARD (Cont'd)

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

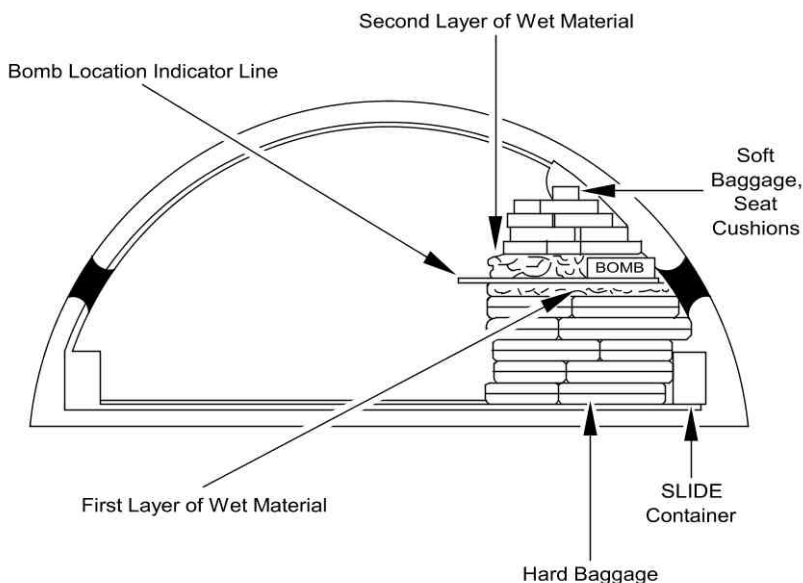
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



PASSENGERS.....MOVE/ADVISE


*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
<i>Evacuate through normal and emergency exits on the opposite side of the “bomb” location. Do not use the door just opposite the “bomb”.</i>		
<i>Use all available airport facilities to disembark without delay.</i>		





## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS..... MAX AVAIL

GND SPLR.....ARM

MAX BRK PR..... 1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE



	FORCED LANDING (Cont'd)	
--	-------------------------	--

ELT..... CHECK EMITTING <i>If not, switch on the transmitter.</i>
■ <b>If Evacuation not required:</b> CABIN CREW and PASSENGERS (PA)..... NOTIFY

## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


### WHEN DESCENT ESTABLISHED

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

**CAUTION** Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: The recommendation is to descend with the autopilot engaged.  
 Use of the autopilot is also permitted in EXPEDITE mode .

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.

**OVERWEIGHT LANDING**

**LDG CONF..... AS REQUIRED**

*Use the ECAM flap setting, if required for abnormal operations. In all other cases :*

- *FULL is preferred for optimized landing performance*
  - *If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.*
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.*

Note:     *For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.*

**LDG DIST.....CHECK**

**PACK 1 and 2.....OFF or supplied by APU**

*Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.*

● **In the final approach stages**

**TARGET SPEED..... VLS**

*Reduce the selected speed on the FCU to reach VLS at runway threshold.*

*Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).*

● **At main landing gear touchdown**

**REVERSE THRUST..... USE MAX AVAILABLE**

● **After nosewheel touchdown**

**BRAKES.....APPLY AS NECESSARY**

*Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.*

● **Landing complete**

**BRAKE FANS  ..... ON**

*Be prepared for tire deflation, if temperatures exceed 800 °C.*

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								

# STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note:     *In case of lack of pitch down authority, reducing thrust may be necessary.*

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note:     *In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note:     *If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

# STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note:     *When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.*

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.  
Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- If the aircraft enters a volcanic ash cloud:
 

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
PACK FLOW.....	HI

Note:     If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

If airspeed is unreliable or lost,Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

Note:     If all engines flame out and speed indications are lost,Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note:     If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

Due to the increased noise level, pay particular attention to visual warnings.





## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

■ **At takeoff**

■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.





## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*


Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

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<b>WINDSHIELD/WINDOW ARCING</b>		
<p>Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL</p> <p><i>Pull the circuit breaker of the affected window/windshield heating system, in case of :</i></p> <ul style="list-style-type: none"><li>- <i>Electrical arcing of the cockpit windshield/window, or</i></li><li>- <i>Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.</i></li></ul> <p><i>On the rear C/B panel :</i></p> <ul style="list-style-type: none"><li>• ANTI ICE L WSHLD C/B AF10 (123VU)</li><li>• ANTI ICE R WSHLD C/B AF03 (123VU)</li><li>• ANTI ICE/WINDOWS L C/B X14 (122VU)</li><li>• ANTI ICE/WINDOWS R C/B W14 (122VU)</li></ul>		



## WINDSHIELD/WINDOW CRACKED

**DIAGNOSIS OF INNER PLY.....PERFORM**

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

**MAX FL.....230/MEA**

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

**CAB PRESS MODE SEL.....MAN**

**MAN V/S CTL.....AS RQRD**

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


**CAB PRESS MODE SEL.....AUTO**

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

**CAB PRESS MODE SEL.....MAN**

**MAN V/S CTL.....FULL UP**

*Due to the increased noise level, pay particular attention to visual warnings.*

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>80.13</b>
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<b>ECAM ADVISORY CONDITIONS</b>
---------------------------------

SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
OXY	Cockpit oxygen bottle pressure < 600 PSI.	If mask is not being used, check if it is correctly stowed.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).



## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION

$$VAPP = VREF + \Delta VREF + APPR COR$$

=

VREF												
Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78	
VREF (KT) = VLS CONF FULL	CG < 25%	108	113	118	123	127	131	136	140	144	148	149
	CG ≥ 25%	106	111	116	121	125	129	134	138	142	146	147

+

$\Delta VREF^{(1)}$

+

APPRoach CORrection		
if $\Delta VREF \leq 10$ kt	if $10 \text{ kt} < \Delta VREF < 20$ kt	if $\Delta VREF \geq 20$ kt
APPR COR is the Highest of		
5 kt * if A/THR ON and / or in case of ice accretion**	1/3 Headwind Max = 15 kt	APPR COR = 1/3 Headwind Max = 10 kt
APPR COR + $\Delta VREF$ limited to 20 kt		APPR COR = 0 kt

\* Multiply the landing distance by an additional factor of 1.1

\*\* In CONF3, add another 5 knot speed increment and multiply the landing distance by an additional factor of 1.2 (instead of 1.1)

=

$$VAPP = VREF + \Delta VREF + APPR COR$$

TO BE INSERTED IN THE MCDU PERF APPR PAGE

(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:

Failure : ALTN LAW  
Flight Conditions : Autothrust ON, ice accretion  
Landing Configuration : CONF 3  
Headwind : 12 kt  
Landing Weight/CG : 48 t/25 %  
VREF determined from the landing weight : 116 kt  
VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt}/3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136$  kt

USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

- Use the **LDG DIST factors “WITHOUT REV”** when:
- All reversers are inoperative, or
  - Maximum reverse thrust on available reverser(s) is not selected, or
  - The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors “WITH REV”** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:      *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

- Determine the FLAPS lever position for landing to be selected
- Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$
- Determine the  $\Delta VREF$
  - Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)
- Compute the LDG DIST:
- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
  - Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES


- Only combine PRIMARY or INDEPENDENT failures
- Determine the Flaps lever position for landing to be selected:
- Use the lowest Flaps Lever Position for landing(i.e. if FULL and 3, use 3)
- Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$
- Use the highest  $\Delta VREF$  to compute VAPP
  - Determine the APPRoach CORrection (*Refer to VAPP Calculation*)
- Compute the LDG DIST:
- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
  - Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
  - Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
	3	10			1.40x1.90x1.1=3.00
RESULT	3	10			


VREF = 131 kt. Therefore VAPP = 131 +10 +5=146 kt.



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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



*Continued from the previous page*

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	if there is ice accretion				
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	2.30 2.45	1.90 2.05
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	2.40 2.55	2.35 2.50
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	DUAL IR FAULT/DUAL ADR FAULT	3	10	1.35*	1.30*
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	2.25 2.45	1.70 1.85
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	2.40 2.60	2.30 2.50
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.10 1.20
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
NAV	IR 1+2+3 FAULT	3	10	1.85	1.85
	DUAL IR FAULT/ DUAL ADR FAULT	3	10	1.35*	1.20*
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.00* 1.35*	1.90* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL


<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(f)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*



*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	3.35 3.90	1.60 1.75
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	3.45 3.95	3.30 3.65
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
NAV	IR 1+2+3 FAULT	3	10	1.45	1.45
	DUAL IR FAULT/DUAL ADR FAULT	3	10	1.30*	1.10
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.


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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.



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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
	AIR PACK 1(2) REGUL FAULT	ACSC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B W21 and W22 on 122VU</li> <li>- Pull C/B X21 and X22 on 122VU</li> <li>- Pull C/B Y18, Y20 and Y21 on 122VU</li> <li>- Pull C/B D8 on 49VU</li> <li>- Wait 5 s before pushing all the C/Bs.</li> </ul>





*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	AUTO FLT FCU 1(2) FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>







*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT and/or Loss of Passenger Address and/or Loss of Cabin Interphone	CIDS	<p><b>Confirm if spurious:</b></p> <ul style="list-style-type: none"> <li>- Check PA function</li> <li>- Check Cabin Interphone function</li> <li>- Check Cabin Lighting function</li> </ul> <p>If spurious, reset the CIDS when aircraft is self powered (APU or engine).</p> <p><b>On ground or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: P13  and P14  on 121VU, G01 and G02 on 49VU, M05 and, M06 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: M05, M06, G01, G02, P13 , P14 .</li> <li>- After CIDS reset, wait approximately 4 min before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:             <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M06 on 121VU.</li> </ul> </li> <li>• IF UNSUCCESSFUL:             <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M05 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M06, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: H01 on 49VU, Q14 on 121VU.</li> <li>- Wait 10 s, then:</li> <li>- Push the C/Bs in the following order: Q14, H01.</li> </ul>
24	GPU cannot be connected to the aircraft	GAPCU	<p><b>On ground only:</b></p> <p>The GPU cannot be connected to the electrical network of the aircraft (AVAIL light is OFF):</p> <ul style="list-style-type: none"> <li>• If at least one power source (IDG 1 or 2, APU GEN or batteries) is connected to the electrical network of the aircraft.             <ul style="list-style-type: none"> <li>- Reset the EXT PWR pb on 35VU (Press and release)</li> </ul> </li> <li>• If no power source is connected to the electrical network of the aircraft.             <ul style="list-style-type: none"> <li>- Set the BAT 1 pb-sw and BAT 2 pb-sw to AUTO.</li> </ul> </li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
26	SMOKE DET FAULT	CIDS-SDF	<b><u>On ground or in flight:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C05 and C06 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>
	SMOKE LAVATORY DET FAULT with all lavatories declared inoperative on the FAP	CIDS or CIDS-SDF	<b><u>On ground or in flight:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs P13 and P14  on 121VU, G01 and G02 on 49VU, M05 or M06 or M07 on 121VU.</li> <li>- Wait 5 s, then</li> <li>- Push the C/Bs in the following order: M05 or M06 and M06 or M07 on 121VU, G01 and G02 on 49VU, P13 and P14  ; on 121VU.</li> </ul> <b><u>If unsuccessful, on ground only:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C06 and C05 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>
	SMOKE FWD (AFT) CARGO DET FAULT SMOKE FWD (AFT) CRG 1 / 2 BTL FAULT	CIDS-SDF	<b><u>On ground:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C05 and C06 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><b>Note:</b></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the 3 C/B:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li><li>• Channel 1 and 2 (L26 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the 3 C/B.</li></ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	BRAKES SYS 1(2) FAULT or BRAKES BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><u>Note:</u>    After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>    After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	WHEEL N.W STEER FAULT or WHEEL N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>    After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	L/G LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:             <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:             <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<u>On ground only:</u> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
	ISIS malfunction	ISIS	<u>On ground only:</u> With aircraft not moving: <ul style="list-style-type: none"> <li>- Pull C/B F12 on 49VU,</li> <li>- Wait 5 s, then push the C/B,</li> <li>- Normal operation is expected after approximately 2 min.</li> </ul> <p><u>Note:</u>     <i>In the case of small aircraft motion during the C/B reset (refueling, cargo loading conditions, etc.), the ATT red flag may appear on the ISIS. In this case, press the RST P/B for 2 s, and wait 2 min to recover normal operation.</i></p>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus. <p><u>On ground, or in flight:</u></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

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# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

- **LHS Captain is PF. During the C-TWO + briefing review:**

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strokes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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**LOW TEMPERATURE ALTIMETRY**

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

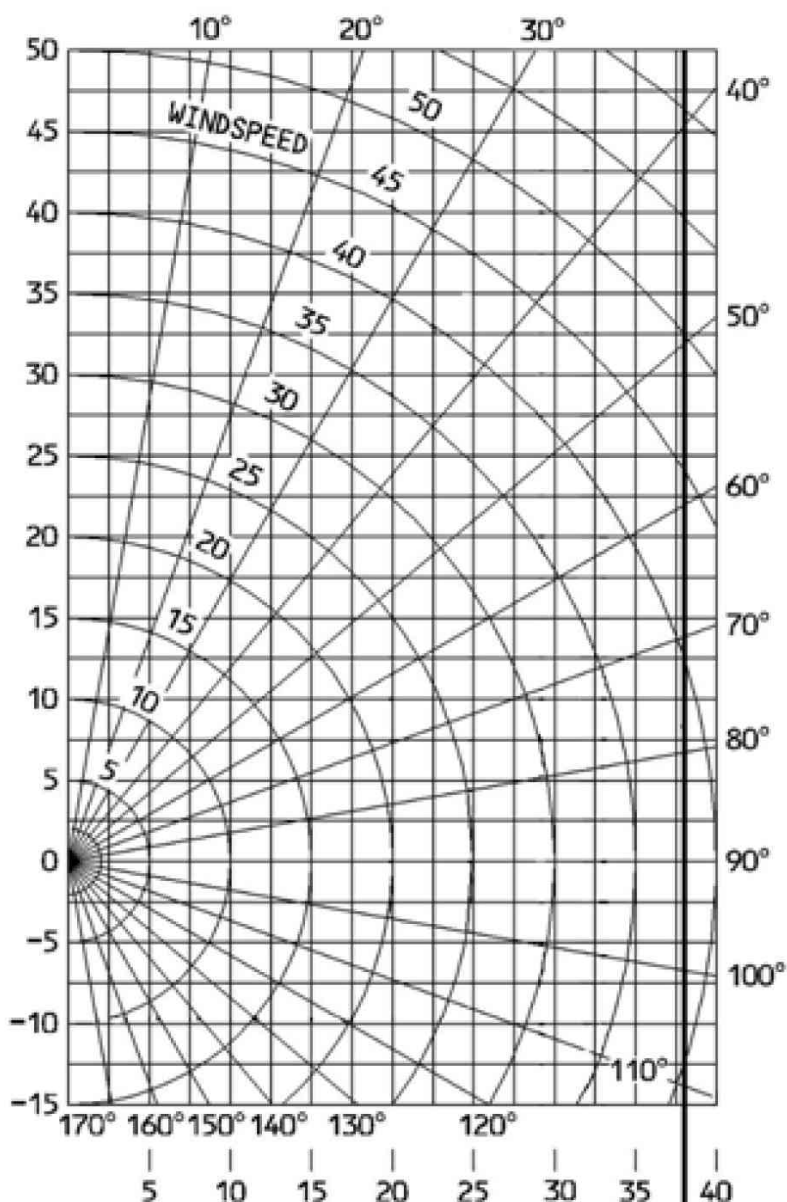
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320E

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT		01	
	EMER ELEC CONFIG		08		if there is ice accretion			
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		BRK RELEASED		02	
			S ≥ 1		03	ALTN L(R) RELEASED if NORM BRK FAULT		03
	1 ≤ FLAPS < 2	S < 1	04		ALTN L(R) RELEASED if G SYS LO PR		04	
			S ≥ 1		05	NORM BRK FAULT		05
	2 ≤ FLAPS < 3	S < 1	06		NORM + ALTN BRK FAULT		06	
			S ≥ 1	07	NAV	IR 1+2+3 FAULT		01
	FLAP = 3	S < 1	08	DUAL IR FAULT/DUAL ADR FAULT		02		
		1 ≤ S ≤ 3	09	ALL ADR OFF		03		
		S > 3	10	BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01	
	FLAP > 3	S < 1	11		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	12			REV UNLOCK with buffet (CONF 3)		02
		S > 3	13	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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**IN FLIGHT PERFORMANCE**

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**SPEEDS**

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

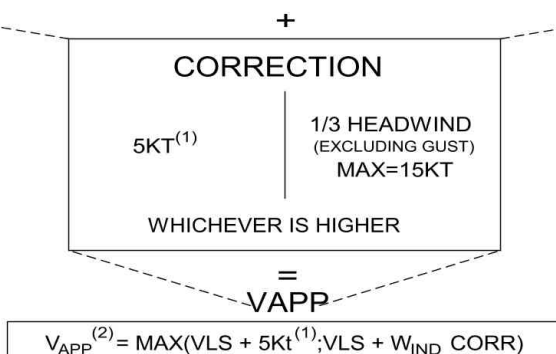
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600
CORRECTION ON ACTUAL LANDING DISTANCE											
RUNWAY CONDITION	dry runway	wet runway	runway covered with								
			standing water	slush		compacted snow	ice				
per 1 000 ft above SL	+3 %	+4 %	+4 %		+5 %		+4 %		+5 %		
per 10 kt headwind	No correction for headwind due to wind correction on approach speed										
per 10 kt tailwind	+17 %	+21 %	+24 %		+22 %		+16 %		+24 %		
forward C.G.	+2 %	+3 %	+3 %		+3 %		+3 %		+3 %		
2 reversers operative	-5 %	-12 %	-15 %		-14 %		-12 %		-27 %		
Per 5 kt speed increment (and no failure) add 8 % (all runways)											

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 x 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 x 1.06 x 1.08 = 1 020 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:*    - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

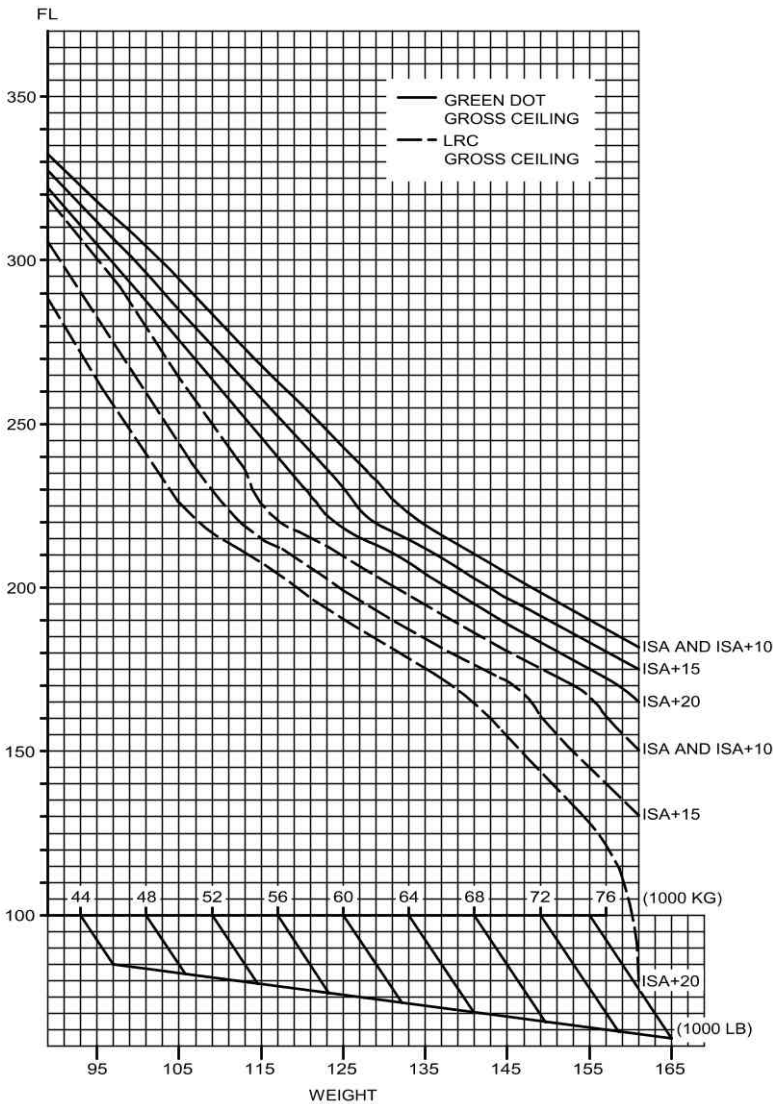
- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).



CEILINGS

**ONE ENGINE OUT**

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT											
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)			
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)			
ANTI ICE OFF				LEVEL OFF (FT)							
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL										
	250	290	310	330	350	370	390				
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200				
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300				
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200				
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200				
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600				
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100				
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800				
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400				
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100				
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600				
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000					
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400					
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800					
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200					
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600						
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON					
FUEL		+ 14 %				+ 28 %					
TIME		+ 13 %				+ 26 %					
DISTANCE		+ 12 %				+ 23 %					
LEVEL OFF		- 700 ft				- 1800 ft					

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b>
		30 MAR 12

## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)	MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.151 .430	1.236 .511	1.267 .515	1.316 .550	1.344 .556	1.393 .584	
	1811 237	1968 258	1792 240	1841 247	1777 239	1801 241	
<b>52</b>	1.158 .435	1.240 .511	1.292 .535	1.327 .553	1.363 .567	1.412 .594	
	1879 240	1987 257	1907 250	1881 248	1855 244	1874 246	
<b>54</b>	1.170 .447	1.245 .510	1.312 .550	1.338 .555	1.385 .581	1.431 .602	
	1983 247	2011 257	1999 256	1925 249	1947 251	1942 249	
<b>56</b>	1.183 .461	1.250 .510	1.323 .553	1.355 .565	1.404 .592	1.440 .600	
	2098 255	2040 257	2044 258	2001 253	2024 255	1963 248	
<b>58</b>	1.226 .510	1.260 .514	1.333 .555	1.374 .576	1.417 .595	1.444 .585	
	2373 283	2095 259	2086 259	2086 259	2071 257	1952 242	
<b>60</b>	1.233 .514	1.270 .519	1.346 .561	1.394 .588	1.420 .585	1.452 .562	
	2415 285	2156 261	2145 262	2174 264	2065 252	1935 232	
<b>62</b>	1.236 .514	1.294 .540	1.362 .570	1.410 .596	1.426 .570		
	2434 285	2287 272	2225 266	2248 268	2055 246		
<b>64</b>	1.239 .513	1.311 .552	1.381 .582	1.418 .595	1.435 .544		
	2454 284	2382 279	2317 272	2272 267	2037 234		
<b>66</b>	1.243 .513	1.322 .556	1.397 .591	1.421 .585			
	2476 284	2432 281	2399 277	2264 263			
<b>68</b>	1.247 .512	1.330 .558	1.412 .599	1.426 .570			
	2499 283	2472 282	2473 280	2253 256			
<b>70</b>	1.254 .514	1.338 .560	1.426 .604	1.436 .543			
	2550 285	2516 283	2537 283	2232 243			
<b>72</b>	1.262 .517	1.351 .567	1.428 .598				
	2604 287	2592 286	2533 280				
<b>74</b>	1.270 .521	1.365 .575	1.432 .587				
	2666 289	2673 290	2523 274				
<b>76</b>	1.290 .539	1.381 .585	1.438 .571				
	2805 299	2767 296	2509 267				
<b>78</b>	1.308 .554	1.395 .593	1.450 .537				
	2927 307	2850 300	2478 250				
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>4/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG				ISA		FUEL CONSUMED (KG)			
PACK FLOW HI				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %					TOTAL ANTI ICE ON △FUEL = + 6 %				

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP

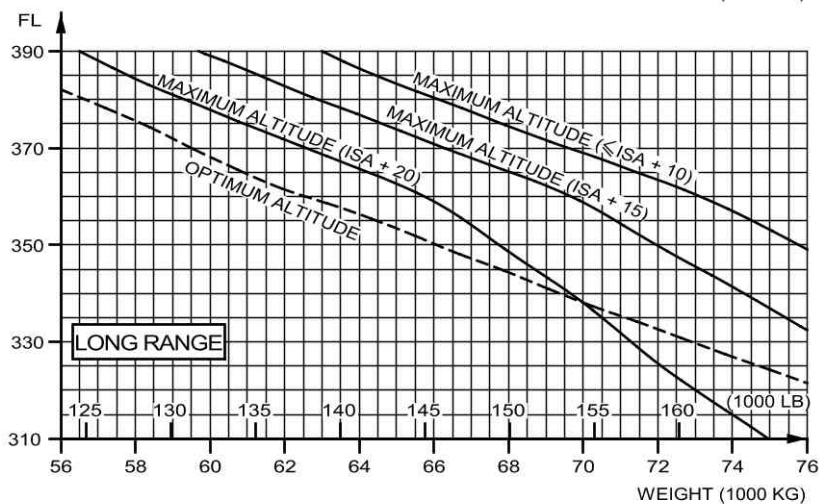
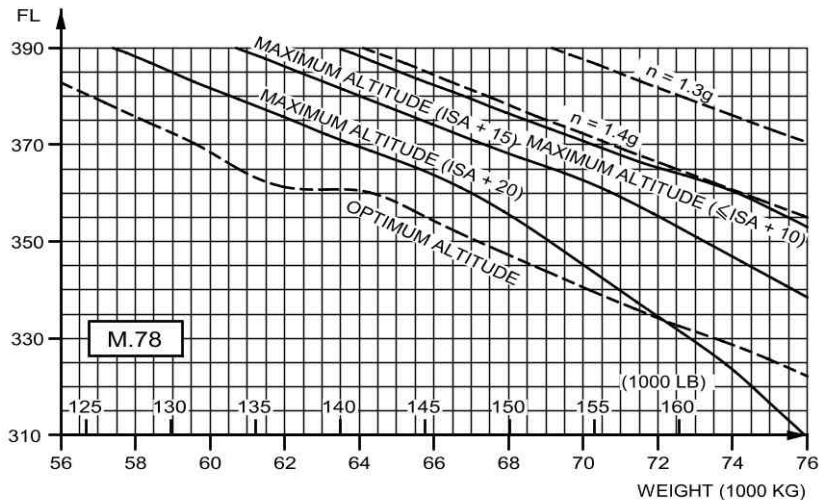
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## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

# IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

**ALL ENGINES**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
						TIME (H.MIN)			
AIR	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION		
DIST.							(KG/1000KG)		
(NM)	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING △FUEL = - 0.4 %			ENGINE ANTI ICE ON △FUEL = + 3 %			TOTAL ANTI ICE ON △FUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NQ-04-10-140

# COST INDEX FOR LONG RANGE CRUISE SPEED

**ALL ENGINES**

- For a quick determination of the  $CI_{LRC}$ , use:
- $CI_{LRC}$  = 40 kg/min in the FMGC.
  - or
  - $CI_{LRC}$  = 55 (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									IAS (KT)
	45				65				
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF						TIME (H.MIN)			
AIR DIST. (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 3 %			ΔFUEL = + 7 %			

CL-W0-04-13-140





# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

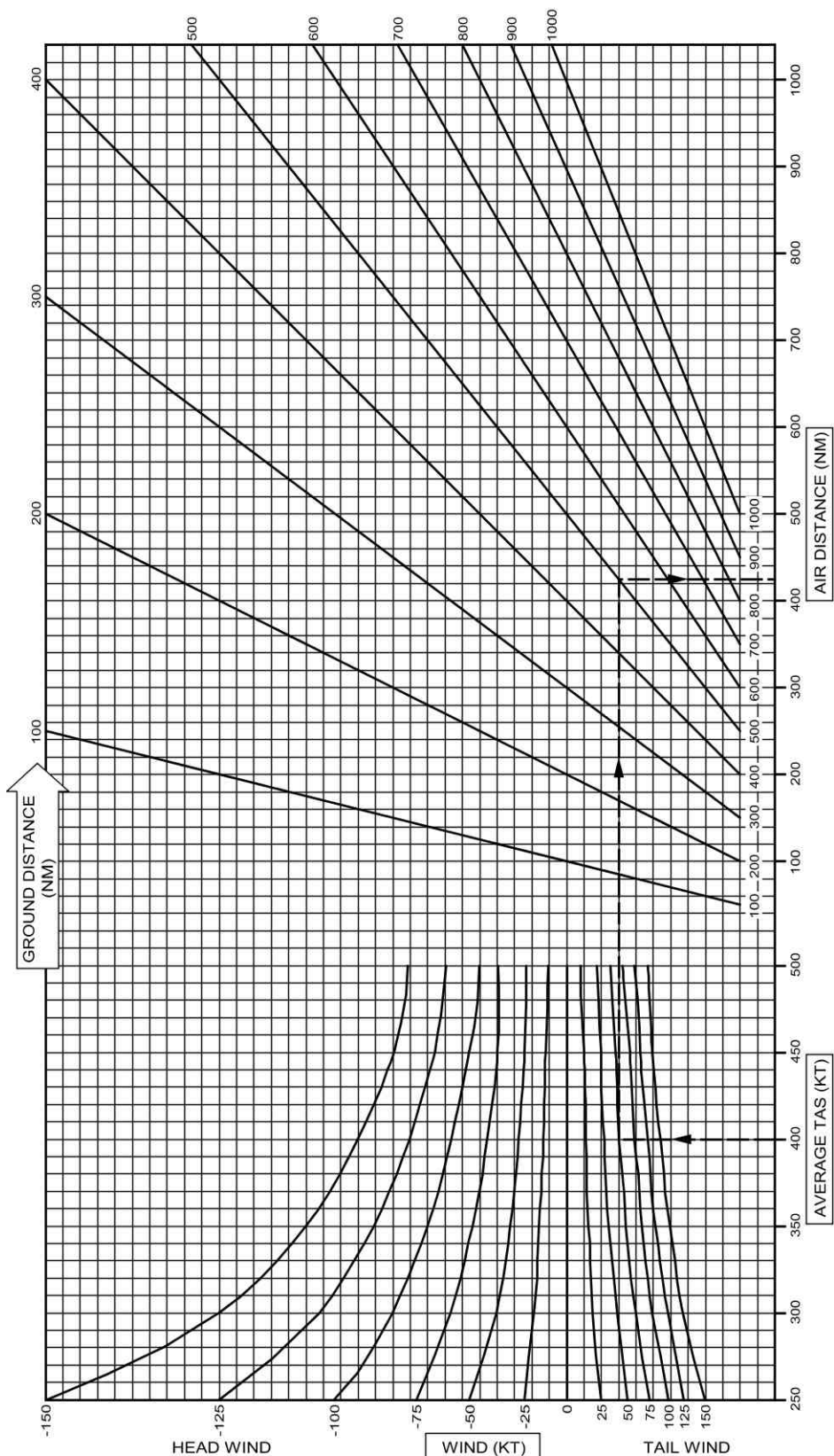
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING		ISA		FUEL CONSUMED (KG)			
ANTI-ICING OFF		CG = 25.0%		TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46
260	1870 1.03	1936 1.00	2004 0.99	2074 0.97	2148 0.95	2222 0.92	2277 0.90
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.98	2396 0.95	2456 0.93
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.99	2634 0.96
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.99
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35
AIR CONDITIONING OFF △FUEL = - 1.5 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 6 %		

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	IN FLIGHT PERFORMANCE	FPE-CAB <b>2/2</b>
		30 MAR 12

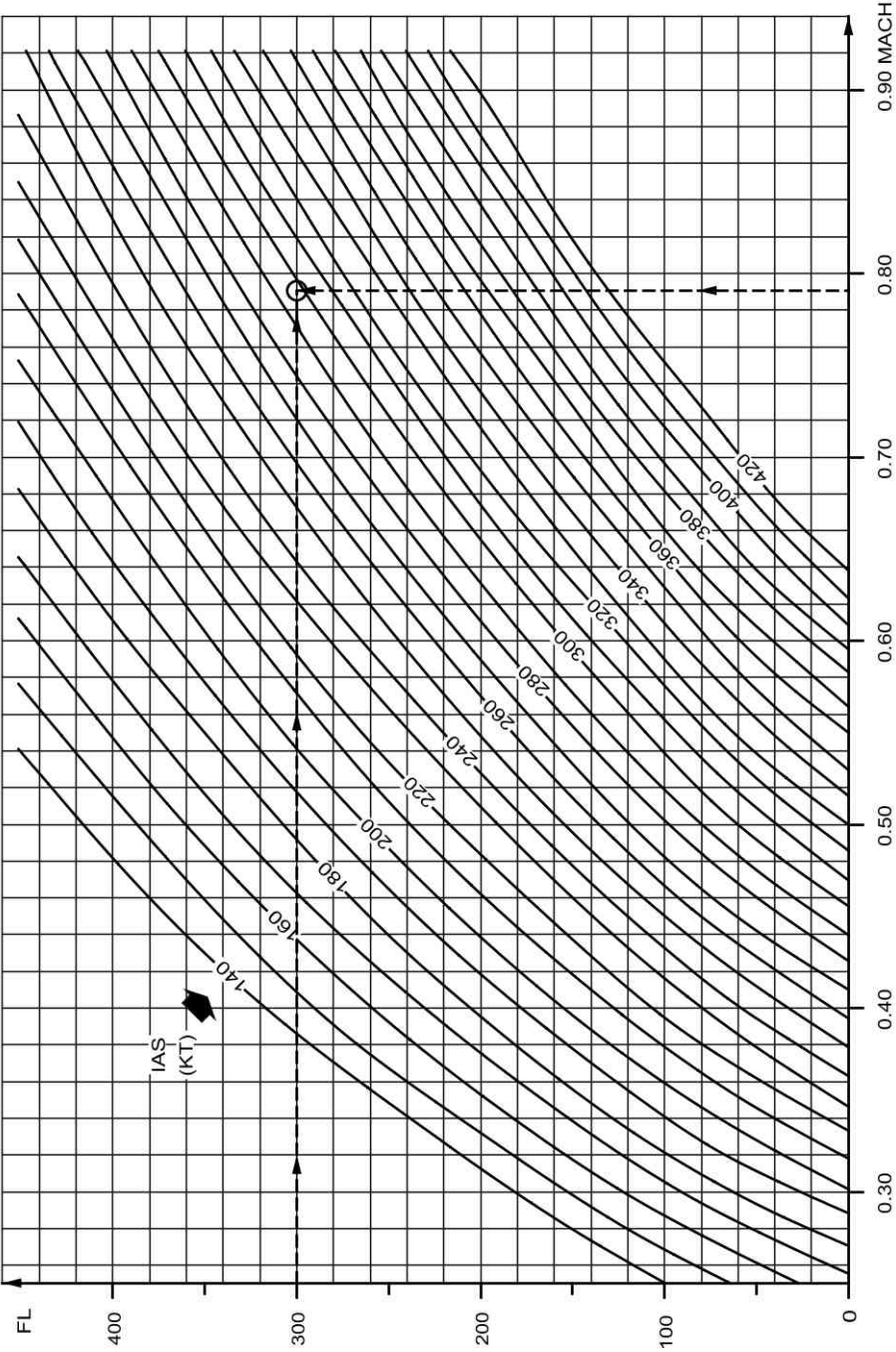
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**







## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

FPF (HYD G SYS LO PR) = 10 %

FPF (INOP SYS: L AIL) = 8 %

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x (10 % + 8 %)

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x 8 %

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT	L/G DOOR	All landing gears doors are extended	15 %
	DOORS NOT CLOSED			

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**


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**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

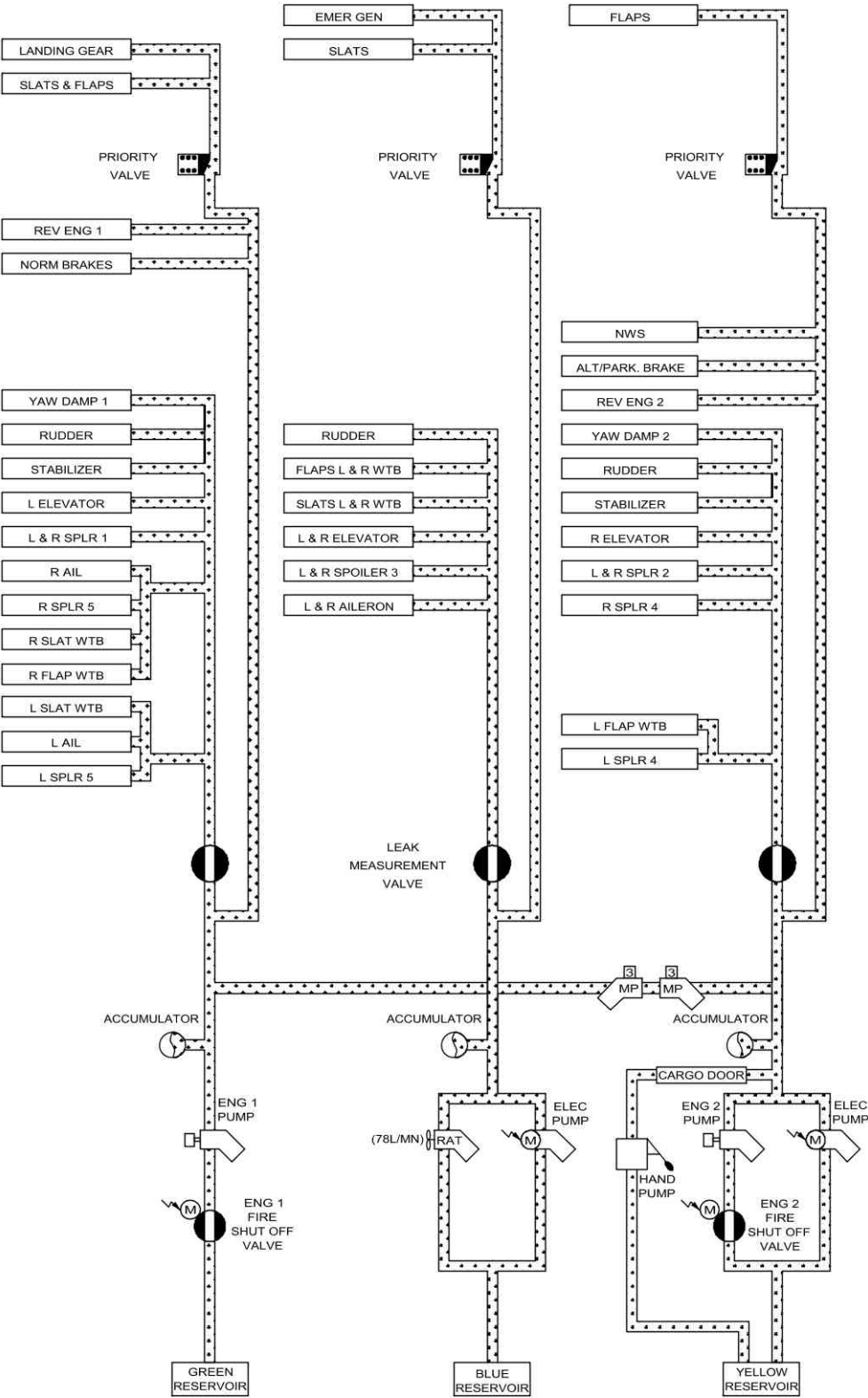
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

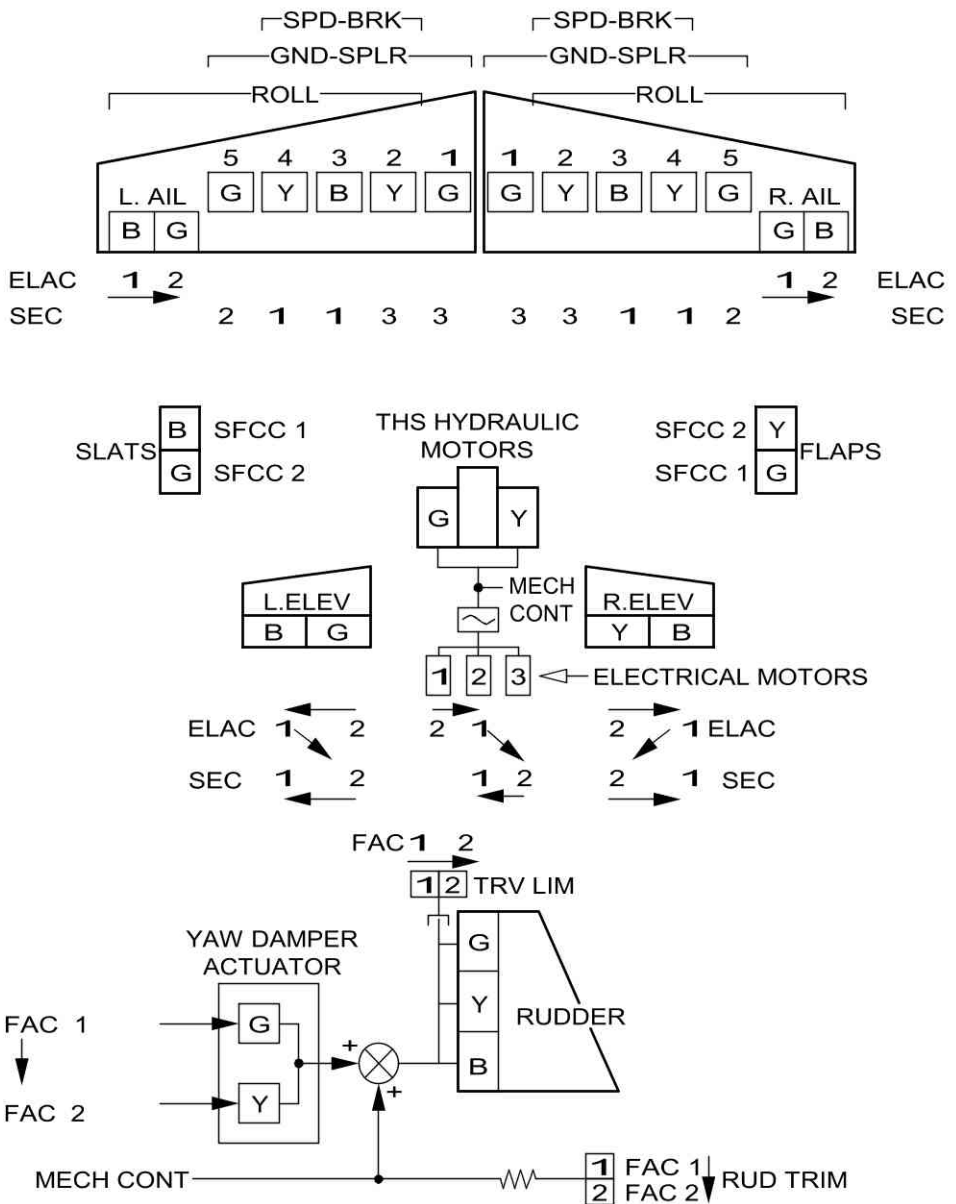
A/THR in managed speed.....USE

HYDRAULIC ARCHITECTURE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.



# **OPERATIONS ENGINEERING BULLETINS**

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**OEBPROC-PLP PRELIMINARY PAGES**

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**OEBPROC-36 No SRS Engagement During Go Around in the Case of  
EPR Mode Fault**

**No SRS Engagement During Go Around in the Case of EPR Mode  
Fault.....36.00**

**No SRS Engagement During Go Around in the Case of EPR Mode  
Fault.....36.01**

**OEBPROC-38 Erroneous Radio Altimeter Height Indication**

**Erroneous Radio Altimeter Height Indication..... 38.00**

**Erroneous Radio Altimeter Height Indication..... 38.01**

**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2)  
BLEED FAULT**

**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED  
FAULT.....40.00**

**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED  
FAULT.....40.01**

**OEBPROC-41 Erroneous Alternate Fuel Predictions Upon  
Modification of a Company Route in the Alternate Flight Plan**

**Erroneous Alternate Fuel Predictions Upon Modification of a  
Company Route in the Alternate Flight Plan.....41.00**

**Erroneous Alternate Fuel Predictions Upon Modification of a  
Company Route in the Alternate Flight Plan.....41.01**

**OEBPROC-43 F/CTL SPOILER FAULT**


**F/CTL SPOILER FAULT..... 43.00**

**F/CTL SPOILER FAULT..... 43.01**

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

**L/G GEAR NOT DOWNLOCKED..... 44.00**

**■ L/G GEAR NOT DOWNLOCKED ■..... 44.01**

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## **OEB36 Issue 1.0**

### **NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT**

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSQ					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSQ					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSQ				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSQ				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSQ				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSQ				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



AIR ENG 1(2) BLEED ABNORMAL PR  
 OR AIR ENG 1(2) BLEED FAULT (Cont'd)

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).





## OEB41 Issue 1.0

# ERRONEOUS ALTERNATE FUEL PREDICTIONS UPON MODIFICATION OF A COMPANY ROUTE IN THE ALTERNATE FLIGHT PLAN

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 204.

This OEB is issued to inform the operators of the following: Erroneous alternate (ALTN) fuel predictions are experienced when the flight crew modifies a company route (CO RTE) previously inserted in the alternate Flight Plan (F-PLN).

This OEB provides an explanation and operational recommendations in case of erroneous ALTN fuel predictions.

**Applicable to:**

Aircraft with Honeywell FMGC Release 1A "H2" (MOD 38778, Airbus SB A320 22-1269 and MOD 38779, Airbus SB A320 22-1270)


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		41.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-41		Erroneous Alternate Fuel Predictions Upon Modification of a Company Route in the Alternate Flight Plan	00013616.0001001	30 MAR 12
Criteria: P10763 Applicable to: B-HSQ					
	OEBPROC-41		Erroneous Alternate Fuel Predictions Upon Modification of a Company Route in the Alternate Flight Plan	00013617.0001001	30 MAR 12
Criteria: P10763 Applicable to: B-HSQ					



## **ERRONEOUS ALTERNATE FUEL PREDICTIONS UPON MODIFICATION OF A COMPANY ROUTE IN THE ALTERNATE FLIGHT PLAN**

### **ECAM ENTRY**

None

### **PROCEDURE**

This OEB PROC N°41 is issued to provide flight crews with the following recommendations:  
This procedure only applies when a CO RTE is used for ALTN F-PLN. In the case of ALTN fuel predictions erroneously set to zero further to a modification of this ALTN F-PLN:

**ENTER** manually a waypoint in the en-route F-PLN (neither in the departure, nor in the arrival), to start a new computation of ALTN fuel predictions

Maintain or delete the entered waypoint at convenience

Check the ALTN fuel predictions are correct

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	BLANK
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>43.00</b> 30 MAR 12
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## OEB43 Issue 2.0

### F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSQ				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSQ				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above  $V_{FE_{NEXT}}$ , the flight crew should deselect A/THR, decelerate to  $V_{FE_{NEXT}}$ , and select CONF 1 when below  $V_{FE_{NEXT}}$ . When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... $V_{REF} + 10KT$

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers.....x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>44.00</b> 30 MAR 12
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## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSQ				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSQ				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

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		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HSR**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	<b>2/2</b>
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date

No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>		<b>1/2</b>
			30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Identification</b>	<b>T<sup>(2)</sup></b>	<b>E<sup>(3)</sup></b>	<b>Rev. Date</b>	<b>Title</b>
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HSR</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HSR</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HSR</b>				
	OEB41 issue 1.0	W	N	30 MAR 12	Erroneous Alternate Fuel Predictions Upon Modification of a Company Route in the Alternate Flight Plan
	Criteria: P10763 <b>Applicable to: B-HSR</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HSR</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HSR</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12


<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-41	Erroneous Alternate Fuel Predictions Upon Modification of a Company Route in the Alternate Flight Plan	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	1/2
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-31	<b>MULTIPLE UNDUE ECAM ALERTS</b>	00013755.0001001	30 MAR 12
	Criteria: 31A1220, 31-1276, P8671, P9824 <b>Applicable to: B-HSR</b> Impacted DU: <i>NONE</i> <u>Reason for issue:</u> <i>This Temporary Revision is issued to give a procedure to the crew in the case of multiple suspected undue ECAM alerts.</i>			

	ABN-80	<b>Computer Reset Table</b>	NG00824	
	ABN-80	<b>Computer Reset Table - 21 - Air Conditioning/Ventilation/Pressurization</b>	00013738.0001001	30 MAR 12
	Criteria: K10463 <b>Applicable to: B-HSR</b> Impacted DU: <i>NONE</i>			
	ABN-80	<b>Computer Reset Table - 23 - Communications</b>	00013850.0024001	30 MAR 12
	Criteria: K12824, K12825, K3901, K8400, SA <b>Applicable to: B-HSR</b> Impacted DU: 00010910 Computer Reset Table - 23 - Communications <u>Reason for issue:</u> <i>CIDS Director Hardware 333B and On Board Replacement Module (OBRM) 33A are sensitive to short power supply interruptions. These power supply interruptions occur when the aircraft is supplied by external power. As a consequence, ECAM caution "COM CIDS 1+2 FAULT" or CIDS Maintenance status 'CIDS 1' or 'CIDS 2' could be spuriously triggered. In such event, the flight crew should verify that the CIDS is functioning normally by checking the PA, Cabin Interphone and Cabin lighting function. If the ECAM caution is spurious, it can be removed by resetting the CIDS when the aircraft is powered by the APU.</i>			
	ABN-80	<b>Computer Reset Table - 27 - Flight Controls</b>	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HSR</b> Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	5030		B-HSR	320-232


(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12


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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>2/6</b>
		30 MAR 12


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	Applicable to: ALL			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	Applicable to: ALL			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	Applicable to: ALL			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	Applicable to: ALL			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	Applicable to: ALL			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	Applicable to: ALL			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	Applicable to: ALL			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	Applicable to: ALL			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	Applicable to: ALL			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	Applicable to: ALL			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	Applicable to: ALL			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	Applicable to: ALL			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	Applicable to: ALL			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	Applicable to: ALL			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	Applicable to: ALL			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	Applicable to: ALL			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	Applicable to: ALL			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	<b>Applicable to: ALL</b>			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	<b>Applicable to: ALL</b>			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	<b>Applicable to: ALL</b>			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	<b>Applicable to: ALL</b>			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	<b>Applicable to: ALL</b>			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	<b>Applicable to: ALL</b>			


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	Applicable to: ALL			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	Applicable to: ALL			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	Applicable to: ALL			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	Applicable to: ALL			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	Applicable to: ALL			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	Applicable to: ALL			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	Applicable to: ALL			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	Applicable to: ALL			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	Applicable to: ALL			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	Applicable to: ALL			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	Applicable to: ALL			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	Applicable to: ALL			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	Applicable to: ALL			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	Applicable to: ALL			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**


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Use of Summaries.....	GEN.02
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IMPORTANT		

### **SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
 As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

### **TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

#### **PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

#### **PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

### **Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

### **ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

### **ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.



## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : Index of the back cover page interior                                                                                           |
| C3              | : Index of the back cover page exterior                                                                                           |
| "BLANK"         | : Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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**ELEC EMER CONFIG Summary.....24.02**

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<b>CABIN OVERPRESSURE</b>		
Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure		
PACK 1 or 2..... OFF		
BLOWER + EXTRACT..... OVRD		
<i>Cabin air is extracted overboard.</i>		
$\Delta P$ ..... FREQUENTLY MONITOR		
● If $\Delta P > 9$ PSI		
PACK 1+2..... OFF		
<b>LAND ASAP</b>		
Before 10 min from landing:		
PACK 1+2..... OFF		
BLOWER + EXTRACT..... AUTO		
<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.	

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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered (i.e. when the FMGC prompt is available and selectable on the MCDU MENU page)

- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The “CAB PR LDG ELEV FAULT” message is displayed on the ECAM
- A “MAP NOT AVAIL” message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>		<b>EMER GEN RUNNING</b>	<b>BAT ONLY</b>	
			<b>IN FLIGHT</b>	<b>ON THE GROUND</b>
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1+ N° 2	N° 1+ N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	ABCU	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



Continued from the previous page

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
PNEU	ISIS	Norm	Norm	Norm
	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
APU	X BLEED (MAN CTL)	Norm	Inop	Inop
	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
PWR PLT	FUEL PUMP	Norm	Norm	Norm
	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
MISC	HP FUEL VALVE closure	Norm	Norm	Norm
	MECH HORN	Norm	Norm	Norm

(a)

Restored, when speed is below 100 kt.

(b)

Crew oxygen valve inoperative.

(c)

Lost, when speed is below 50 kt.

(d)

Lost 30 s after last engine shutdown.

(e)


IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f)

For APU start only.

(g)

Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK UNUSABLE. <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway</b>	2 180	2 300	2 400	2 490	2 620	2 810	3 090	3 380	3 630
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.40								
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind			
<b>DRY Runway</b>	+3 %					+18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
 In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

EMER EXIT LIGHT..... ON

● **If fuel vapors:**

CAB FANS.....ON

PACK 1+2..... OFF

● **If no fuel vapors:**

CAB FANS..... OFF

PACK FLOW..... HI

LDG ELEV..... 10 000 FT/MEA

DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

ATC..... NOTIFY

SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE

*While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*

● **At FL 100 OR MEA:**

APU MASTER SW (if in ELEC EMER CONFIG)... ON

PACK 1+2..... OFF

MODE SEL.....MAN

MAN V/S CTL..... FULL UP

RAM AIR..... ON

APU MASTER SW.....OFF

● **If smoke persists, open CKPT window:**

MAX SPEED.....200 KT

COCKPIT DOOR.....OPEN

HEADSETS..... ON

PNF COCKPIT WINDOW..... OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON-AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMERG
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT.....ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATE:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL.....CONSIDER  
 ELEC EMER CONFIG.....CONSIDER  
*Refer to the end of the procedure to Set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING.....CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

● **IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
BLOWER..... AUTO  
EXTRACT..... AUTO  
PACK 1..... OFF

● **If smoke continues:**

PACK 1..... ON  
PACK 2..... OFF

● **If smoke still continues:**

PACK 2..... ON  
BLOWER..... OVRD  
EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

● **IF CAB EQUIPMENT SMOKE SUSPECTED:**

● **If smoke continues:**

EMER EXIT LIGHT..... ON  
COMMERCIAL..... OFF  
SMOKE DISSIPATION..... CHECK  
FAULTY EQPT..... SEARCH/ISOLATE

● **If smoke still continues or if faulty  
equipment confirmed isolated:**

COMMERCIAL..... NORM

SMOKE/FUMES REMOVAL..... CONSIDER





## **SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

### **UNDETERMINED/AVNCS/ELECTRICAL SMOKE**

- **IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:**  
ELEC EMER CONFIG..... CONSIDER
- **IF SMOKE DISAPPEARS WITHIN 5 MINUTES:**  
NORMAL VENTILATION..... RESTORE

### **TO SET ELEC EMER CONFIG**

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

- **WHEN EMER GEN AVAIL:**

APU GEN.....OFF  
GEN 2..... OFF

### **ELEC EMER CONFIG**

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- **AT 3 min OR 2 000 ft AAL BEFORE LANDING:**

GEN 2..... ON  
EMER ELEC GEN 1 LINE.....ON

- **WHEN A/C IS STOPPED:**

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION


Recommended speed for diversion: MAX SPEED -10 kt

- Note:
- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
  - In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.


MAX SPEED						
Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	230 kt	NO LIMITATION	215 kt	200 kt	185 kt	177 kt (Not allowed)
0 < S < 1						
S = 1						177 kt
1 < S ≤ 3		200 kt		200 kt	185 kt	
S > 3		177 kt		177 kt	177 kt	177 kt

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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<b>SIDESTICK/RUDDER PEDALS STIFF</b>		
<p>Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:</p> <ul style="list-style-type: none"><li>- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or</li><li>- One sidestick and the rudder pedals at the same time.</li></ul> <p>The piloting technique remains the same: The aircraft remains responsive. However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.</p> <p>AP DISENGAGEMENT.....CONFIRM</p> <p>CONSIDER TRANSFERRING CONTROL TO PNF</p> <p>● <b>FOR DECRAB, ROLLOUT, OR ENGINE FAILURE</b></p> <p>BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL</p>		



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

# STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

**● IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

**● IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP

**FUEL IMBALANCE**

FOB..... CHECK  
 Compare the FOB + FU, with the FOB at departure.  
 If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. Refer to ABN-28 FUEL LEAK.
----------------	------------------------------------------------------------------------------------------------------------------------------------

FUEL X FEED..... ON  
 ● On the lighter side and in the center tank:  
   FUEL PUMPS.....OFF  
 ● When fuel is balanced:  
   FUEL PUMPS (WING + CTR)..... ON  
   FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.
- The destination EFOB turns to amber on the F.PLN (or on the FUEL PRED) page, or
- "DEST EFOB BELOW MIN" appears on the MCDU scratchpad.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

## LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK PUMP 1+2..... OFF

*Each engine is fed via its associated inner tank only.*

INNER TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each inner tank.*

#### ■ CASE 1: IF ONE INNER TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 CTR TK PUMP 1+2..... ON  
 FUEL LEAK..... MONITOR

#### ● If leak stops:

If the inner tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*





**FUEL LEAK (Cont'd)**

● **If leak continues (after engine shutdown):**

The inner tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.

ENGINE RESTART..... CONSIDER

CAUTION	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
---------	----------------------------------------------------------------------------------------------------------------------

■ **CASE 2: IF BOTH INNER TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

● **If fuel smell in the cabin:**

APU (if ON)..... OFF

*This prevents additional fuel loss through the APU feeding line.*

● **When fuel quantity in one inner tank is less than 3 t (6 600 lb):**

CTR TK PUMP 1+2..... ON

**FOR LANDING**

CAUTION	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE Flight controls remain in normal law.	
LANDING CONF	APPROACH SPEED
3	VAPP = VREF +6 kt + APPR COR
FULL	VAPP = VREF + APPR COR

<b>W (1 000 KG)</b>	40	44	48	52	56	60	64	68	72	76	78
<b>VREF = VLS CONF FULL</b>	106	111	116	121	125	129	134	138	142	146	147


APPROACH
CAT 2 INOP SLATS SLOW/FLAPS SLOW L/G GRAVITY EXTENSION
LANDING
<b>FLARE</b> Only one ELEV and two spoilers per wing <b>SPOILERS</b> Only 2 per wing <b>REVERSER</b> Only N°1 <b>BRAKING</b> NORMAL <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
<b>DRY runway (CONF full)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>DRY runway (CONF 3)</b>	1 210	1 280	1 330	1 390	1 460	1 560	1 720	1 880	2 020
<b>WET runway (CONF full)</b>	1 700	1 810	1 920	2 060	2 190	2 320	2 460	2 590	2 700
<b>WET runway (CONF 3)</b>	1 740	1 860	1 970	2 110	2 250	2 380	2 520	2 660	2 770
<b>CONTA runway (CONF full)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75								
<b>CONTA runway (CONF 3)</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF 3) and apply LDG DIST Factor = 1.90								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 18 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b>	Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law
<b>SPOILERS:</b>	Only 2 per wing
<b>REVERSER:</b>	Only N°2
<b>BRAKING:</b>	ALTERNATE


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 280	1 360	1 410	1 470	1 540	1 650	1 820	1 980	2 130
WET runway	1 830	1 950	2 080	2 220	2 360	2 510	2 650	2 790	2 920
CONTA runway	Refer to the Landing Distance table without Autobrake ( CONF FULL) and apply LDG DIST Factor = 1.95								

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

CRUISE	
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1 000 KG)	40	44	48	52	56	60	64	68	72	76	78
VREF = VLS CONF FULL	106	111	116	121	125	129	134	138	142	146	147

APPROACH	
CAT 2 INOP	
SLATS SLOW / FLAPS JAMMED	
GPWS FLAP MODE.....	OFF
● For Flaps extension:	
SPD SEL.....	VFE NEXT - 5KT
When in landing CONF : DECELERATE TO CALCULATED VAPP	
Stabilize at VAPP before L/G down, to be trimmed for approach.	
L/G GRAVITY EXTENSION	

LANDING											
<b>FLARE:</b> PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law											
<b>SPOILERS:</b> Only 1 per wing											
<b>NO REVERSER</b>											
<b>BRAKING:</b> BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI											
<b>NO NOSEWHEEL STEERING</b>											


GO-AROUND											
NO GEAR RETRACTION. Increased fuel consumption											
<b>● For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt											
<b>● For diversion:</b> <b>● If Flaps at zero:</b> SELECT CLEAN CONFIGURATION Normal operating speeds <b>● If Flaps not at zero:</b> MAINTAIN SLATS/FLAPS CONFIG Recommended speed: MAX SPD - 10 kt											

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV									
WEIGHT (1 000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1 940	2 050	2 130	2 220	2 330	2 500	2 750	3 000	3 220
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.15								
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.10								
CORRECTIONS	+ 1 000 ft above SL					+ 10 kt tailwind			
DRY runway	+ 3 %					+ 18 %			

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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**DOUBLE AOA HEAT FAILURE**

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or INVALID DATA message),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, ECAM DUs or MCDU 1 is(are) affected.

GEN 1 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 1 ..... ON

#### ■ If DUs stop flashing:

GEN 1 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2 ..... OFF

#### ■ If DUs do not stop flashing:

GEN 2 ..... ON

#### ■ If DUs stop flashing:

GEN 2 ..... KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM ..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR ..... AS RQRD

APU START ..... CONSIDER

### ■ DU is blank (with or without a large letter “F” in amber), or the display is distorted:

DU (affected) ..... AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected) ..... USE

*Transfer SD to the F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected) ..... USE

### ■ INVALID DISPLAY UNIT message is displayed:

This may be caused by a DU failure.

FOR AUTOMATIC DU RECOVERY ..... WAIT MORE THAN 40 s



## DISPLAY UNIT FAILURE (Cont'd)

- **IF DU IS AUTOMATICALLY RECOVERED:**  
No crew action is required.
  
- **IF DU IS NOT RECOVERED:**  
Non-recovered DU..... AS RQRD  
*The DU can be switched off.*
  
- **INVALID DATA message appears (not on all DUs):**  
EIS DMC SWITCHING..... AS RQRD
  
- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note: The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
  
- **INVALID DATA message appears on all DUs:**  
The autopilot, autothrust and MCDU navigation data are still available, and may be used.  
FOR AUTOMATIC DUs RECOVERY ..... WAIT MORE THAN 40 s
  
- **IF ALL DUs ARE AUTOMATICALLY RECOVERED:**  
No crew action is required.
  
- **IF ONE OR MORE DUs ARE NOT RECOVERED:**  
Non-recovered DUs..... OFF FOR 40 s  
Non-recovered DUs..... BACK ON sequentially
  - **If the initial failure re-occurs (INVALID DATA message appears on all DUs), when switching a given DU back ON:**  
Apply the entire procedure again, from the beginning.  
Leave this specific DU permanently OFF.
  
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY ..... OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

MULTIPLE UNDUE ECAM ALERTS

- In the case of multiple undue ECAM alerts concerning :
- ENG 1(2) N1(N2) (EGT) (FF) OVER LIMIT or
  - ENG 1(2) N1(N2) (EGT) (EPR) (FF) DISCREPANCY or,
  - NAV ATT(ALT) (HDG) DISCREPANCY or,
  - NAV FM/GPS POS DISAGREE or,
  - FUEL F.USED/FOB DISAGREE or,
  - MINIMUM or HUNDRED ABOVE callouts,

possibly associated with EFIS red flags, apply the below procedure :

AFFECTED PARAMETERS..... CROSSCHECK

*Crosscheck the affected parameters on the E/WD, PFD, ND or on the related SD page to confirm that the alerts are spurious.*

- **If it is confirmed that the ECAM alerts are spurious, identify the faulty DMC :**  
EIS DMC SWITCH.....CAPT 3  
*DMC 3 replaces DMC 1. If the undue alerts stop, DMC 1 is the faulty DMC.*
- **If unsuccessful :**  
EIS DMC SWITCH.....F/O 3  
*DMC 3 replaces DMC 2. If the undue alerts stop, DMC 2 is the faulty DMC.*

LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

- Note:
1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
  2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
  3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
  4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

Note: The free-fall system may be reset in flights used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed. The flight crew should not reset the free-fall system on the ground after flight.

### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

## LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <b>L/G GEAR NOT DOWN</b> ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### **PREPARATION**

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### **APPROACH**

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### **BEFORE LANDING**

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOMELT.....DIM

### **FLARE, TOUCH DOWN AND ROLL OUT**

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.







## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*


**ASYMMETRIC BRAKING**

Normal braking is faulty, or the green hydraulic system is in low pressure, and all brakes of one gear are released.

Apply brake progressively on the available side. Counter swing with the rudder.  
Avoid crosswind in excess of 10 knots from the side of the available brake.

- **If only one reverse is available:**  
Do not use Reverse on the side of the available brake.

LDG DIST PROC..... **APPLY**  
*Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables; in case of NORM BRK FAULT or G SYS LO PR.*

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ALL ADR OFF

SPD.....FLY THE GREEN  
*Fly within the green area of the speed scale to ensure safe flight. For slats/flaps retraction, it is better to fly at the top of the green area of the speed scale.*

**CAUTION**    *The altitude displayed on the PFD is a GPS altitude.*

MANUAL CABIN PRESSURE CONTROL

MODE SEL..... MAN  
MAN V/S CTL..... AS RQRD  
MAN CAB PR CTL  
TGT V/S    :    CLIMB 500 ft/min  
                  DESC 300 ft/min

A/C GPS ALT	CAB ALT TGT
410	8000
350	7000
300	5500
250	3000
<200	0

FOR APPROACH

SPD.....FLY THE GREEN  
*Before extending the slats/flaps, it is better to fly at the bottom of the speed scale green area, and to be in straight flight.*


FOR LDG.....USE FLAP 3  
LDG DIST PROC..... APPLY  
*Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables*  
APPR SPD.....FLY THE BUG  
*During the approach, the bug indicates VAPP.*

- **WHEN FLAP 2:**  
LDG GRVTY EXTN.....DOWN  
*All gear doors remain open.*
- **WHEN L/G DOWNLOCKED:**  
L/G lever.....DOWN  
GEAR DOWN indications..... CHECK
- **DURING FINAL APPROACH:**  
MAN V/S CTL.....FULL UP

**CAUTION**    *Check that the outflow valve is fully open and that cabin altitude is at airfield elevation before opening the doors.*


STATUS

INOP SYS

REAC W/S DET  
PRED W/S DET   
F/CTL PROT  
ADR 1+2+3  
RUD TRV LIM  
AP 1+2  
A/THR  
CAB PR 1+2  
GPWS



ALL ADR OFF (Cont'd)
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	<div>GPWS TERR </div> <div><u>Other INOP SYS</u></div> <div>RAT automatic extension ATC ALTI MODE TCAS L/G RETRACT</div>
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## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

- The following procedure is not displayed on the ECAM:
- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.
  - **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.
    - **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
    - **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
  - **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure. Aircraft must stay level with constant speed during 30 s.

MODE SELECTOR..... ATT  
LEVEL A/C ATTITUDE..... HOLD  
CONSTANT A/C SPEED..... MAINTAIN

● MCDU INITIALIZATION:

DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*  
IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*  
A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*





## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and  $V_{MAX}$ .*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- **If the safe conduct of the flight is impacted:**

**MEMORY ITEMS**

AP/FD.....	OFF
A/THR.....	OFF
<b>PITCH/THRUST:</b>	
Below THRUST RED ALT.....	15°/TOGA
Above THRUST RED ALT and Below FL 100.....	10°/CLB
Above THRUST RED ALT and Above FL 100.....	5°/CLB
FLAPS.....	Maintain current CONFIG
SPEEDBRAKES.....	Check retracted
L/G.....	UP
When at, or above MSA or Circuit Altitude:	
Level off for troubleshooting	
GPS ALTITUDE.....	Display on MCDU

- **To level off for troubleshooting:**

AP/FD.....	OFF
A/THR.....	OFF

*Note:      Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 67 t	67 t-57 t	Below 57 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	7.5/61.8	7.5/57.5	7.5/53.0
2	F	9.0/61.6	9.0/57.3	9.0/52.8
1 + F	S	4.5/60.2	4.5/56.1	4.5/51.2
1	S	7.5/58.0	7.5/53.9	7.5/48.9
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	250 kt	4.0/62.4	3.0/60.1	2.0/58.3
FL 200 -FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

**FLYING TECHNIQUE TO STABILIZE SPEED :**

Adjust pitch in order to fly the required flight path.  
 When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

**WHEN FLIGHT PATH IS STABILIZED**

PROBE/WINDOW HEAT.....ON

**TECHNICAL RECOMMENDATIONS**

Respect Stall Warning.  
 To monitor speed, refer to IRS Ground Speed or GPS Ground Speed variations.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

**AFFECTED ADR IDENTIFICATION**

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

- **If at least one ADR is reliable:**  
 Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM  
*Alternates sources may be used to evaluate the air data:*
  - GPS altitude.
  - GPS and IRS ground speeds, taking into account altitude and wind effect.

- **If affected ADR(s) cannot be identified, or if all ADRs are affected:**
  - **When above FL 250:**  
 ONE ADR..... KEEP ON  
 TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*  
 For flight continuation, *Refer to Climb, Cruise and Descent tables.*
  - **When below FL 250, if speed still unreliable:**  
 ALL ADRs P/B..... OFF  
*All ADRs must be switched OFF to replace the PFD's normal speed scale and altitude indication to the Back Up Speed Scale and GPS altitude indication.*  
 SPD..... FLY THE GREEN  
 NAV ADR 1+2+3 FAULT

**CLIMB**  
 Set the thrust to CL.

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
FL 250 - FL 320	275 kt	4.0/CLB	4.0/CLB	4.0/CLB
Above FL 320	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

**CRUISE**  
 Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
FL 250 - FL 320	275 kt	3.0/73.4	2.0/71.6	1.5/70.2
Above FL 320	M 0.76	2.5/79.2	2.5/78.1	2.0/77.0

**DESCENT**  
 Set the thrust to IDLE.



UNRELIABLE SPEED INDICATION/ADR  
CHECK PROC (Cont'd)

CLEAN				
		Above 67 t	67 t - 57 t	Below 57 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 320	M 0.76	-0.5/IDLE	-1.0/IDLE	-1.5/IDLE
FL 320 - FL 250	275 kt	0.0/IDLE	-0.5/IDLE	-1.5/IDLE



## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL225/MEA..... INITIATE

*Descend rapidly to FL 225, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL225 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL225

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 225, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

##### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

##### ■ If ENG 2 BLEED is lost first:

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative:  
X BLEED..... CHECK OPEN  
DESCENT TO FL225/MEA.....CONTINUE  
*Descend rapidly to FL 225, to recover the bleed supply from the APU.*  
APU..... START  
*Start the APU during the descent.*
- AT, OR BELOW, FL225 :  
WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
APU BLEED..... ON  
MAX FL225  
AVOID ICING CONDITIONS
- IF ICE ACCRETION  
APPR SPD..... VLS + 10 KT  
LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 50 000 kg/110 000 lb	-2.5
60 000 kg/132 000 lb	-1.5
70 000 kg/154 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.2 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**

CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**

APU (IF AVAIL).....START

● **WHEN BELOW FL 200**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
78	236	246	256
76	232	242	252
72	224	234	244
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 600 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 ; L/G DOWN) will be approximately 1.2 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.

MIN APPR SPEED.....150 KT  
VAPP.....DETERMINE

Vapp is the maximum between VREF + 25 kt/150 kt:

Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172







## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**
  - **When in CONF 3 and VAPP:**  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING


### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF  
BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**  
PARKING BRK..... ON  
ATC..... NOTIFY  
FIRE pushbutton (ENG and APU)..... PUSH  
AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*
- **If Evacuation required:**  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*
- **If Evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

### IF DITCHING ANTICIPATED

#### APPROACH

FOR LDG..... USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

● At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.  
If that causes a strong crosswind, ditch into the wind.  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*


# **ENG DUAL FAILURE - NO FUEL REMAINING**

The flight crew should apply this paper procedure and then, if time permits, clear ECAM warnings and check the ECAM STATUS page.

THRUST LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
*Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.*  
 OPTIMUM SPEED.....220 KT/GREEN DOT  
*Initially, fly 220 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
68	216	226	236
64	208	218	228
60	200	210	220
56	192	202	212
52	184	194	204
48	176	186	196
44	168	178	188
40	160	170	180

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 600 ft/min .*

LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*  
 EMER ELEC POWER (if EMER GEN not in line).....MAN ON  
 VHF1/HF1  /ATC1.....USE  
 ATC.....NOTIFY  
 CREW OXY MASKS (Above FL 100).....ON  
 CABIN AND COCKPIT.....PREPARE  
 SIGNS.....ON  
 COMMERCIAL.....OFF  
 USE RUDDER WITH CARE  
 ● **WHEN BELOW FL 150**  
 RAM AIR..... ON

## **COMMON ACTIONS FOR THE APPROACH**

### **APPROACH PREPARATION**

*Note:* Final descent slope, when configured (CONF 3/ L/G DOWN), will be approximately 1.2 N/m per 1 000 ft (with no wind).  
 BARO..... SET  
 CREW MASKS/OXY SUPPLY (below FL 100).....OFF

## **IF FORCED LANDING ANTICIPATED**

### **APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
 MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt.*

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	154	159	163	167	171	172

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)**
  - **When in CONF 3 and VAPP**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - **When L/G downlocked**

L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 200 kt (max speed with slats extended).*

GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

**AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

**AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

**AT TOUCHDOWN**


ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

**AFTER LANDING**

- **When the aircraft has stopped :**

PARKING BRK.....ON  
ATC.....NOTIFY

  - **If Evacuation required :**

EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - **If Evacuation not required :**

CABIN CREW and PASSENGERS (PA).....NOTIFY

**IF DITCHING ANTICIPATED**

**APPROACH**

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 150 KT



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 25 kt/150 kt:*


Weight (1 000 kg)	40	44	48	52	56	60	64	68	72	76
Vapp	150	150	150	150	150	151	155	159	163	167

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL  
CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*

AT 500 FT AGL  
BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN  
ENG MASTERS..... OFF

AFTER DITCHING  
ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*


## ENG RELIGHT (IN FLIGHT)

MAX ALTITUDE.....See below  
 ENG MASTER (affected).....OFF  
 THR LEVER (affected).....IDLE  
 ENG MODE SEL.....IGN  
 X BLEED .....OPEN  
 WING A. ICE (for starter assist).....OFF  
 ENG MASTER (affected).....ON

*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*

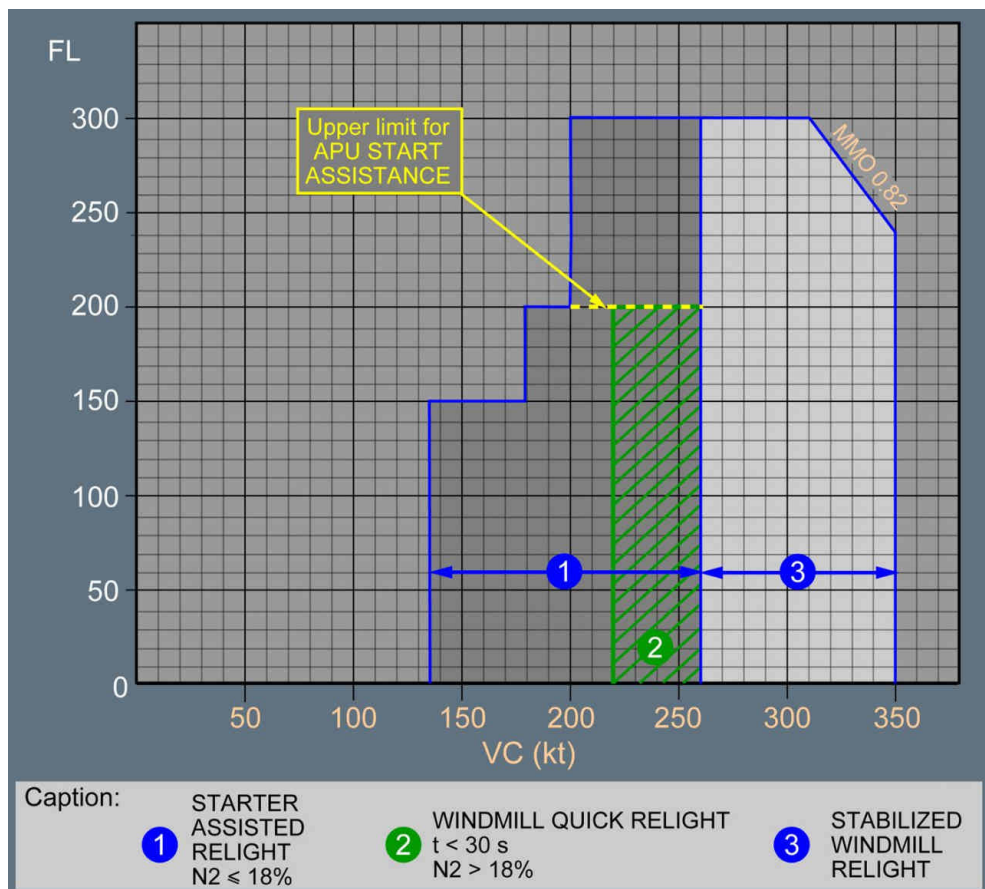
*Engine light up should be achieved within 30 s after fuel flow increases.*

■ **When idle is reached (AVAIL indication pulses in green) :**

ENG MODE SEL.....NORM  
 TCAS MODE SEL  .....check TA/RA  
*Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*  
 Affected SYS.....RESTORE

■ **If no relight :**

ENG MASTER (affected).....OFF  
*Wait 30 s before attempting a new start (to drain the engine).*





## ENG 1(2) STALL

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## ENG 1(2) SHUT DOWN

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
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MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM





## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	70.0	69.0	68.0	67.0	65.0	64.0	62.0	57.0
5	70.0	69.0	68.0	67.0	65.0	64.0	60.0	55.0
10	70.0	69.0	68.0	67.0	65.0	61.0	57.0	52.0
15	70.0	69.0	68.0	66.0	63.0	59.0	54.0	50.0
20	70.0	69.0	66.0	64.0	61.0	56.0	52.0	48.0
25	70.0	67.0	64.0	62.0	58.0	54.0	50.0	46.0
30	67.0	65.0	63.0	60.0	56.0	51.0	47.0	
35	65.0	62.0	60.0	57.0	53.0	49.0		
40	62.0	60.0	58.0	54.0				
45	59.0	57.0	55.0					
50	56.0	54.0						
55	53.0							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

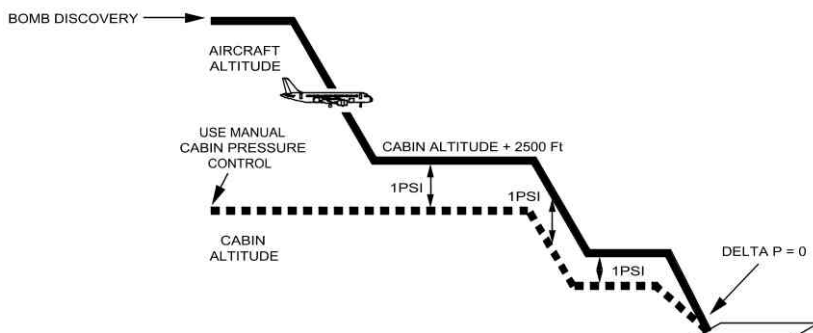
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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<b>BOMB ON BOARD (Cont'd)</b>	
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**PORTABLE ELECTRONIC DEVICES..... SWITCH OFF**  
*The cabin crews must command passengers to switch off all portable electronic devices.*

**BOMB.....CHECK NO ANTI-LIFT DEVICE**  
*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*  
*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*  
*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*  
*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

**EMERGENCY EQUIPMENTS.....REMOVE AND STOW**  
*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

**GALLEY/IFE POWER.....OFF**  
*All galley and IFE equipments located close to the LRBL must be switched off.*

● **If the bomb can be moved:**

**RH AFT CABIN DOOR SLIDE..... DISARM**  
**LEAST RISK BOMB LOCATION (LRBL)..... PREPARE**  
*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*  
*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*  
*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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**BOMB INDICATION LINE..... POSITION**  
*Note: A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*  
*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

**BOMB..... MOVE TO LRBL**  
*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

<b>CAUTION</b>	<i>Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.</i>
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## BOMB ON BOARD (Cont'd)

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

**CAUTION**

**DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.**

Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

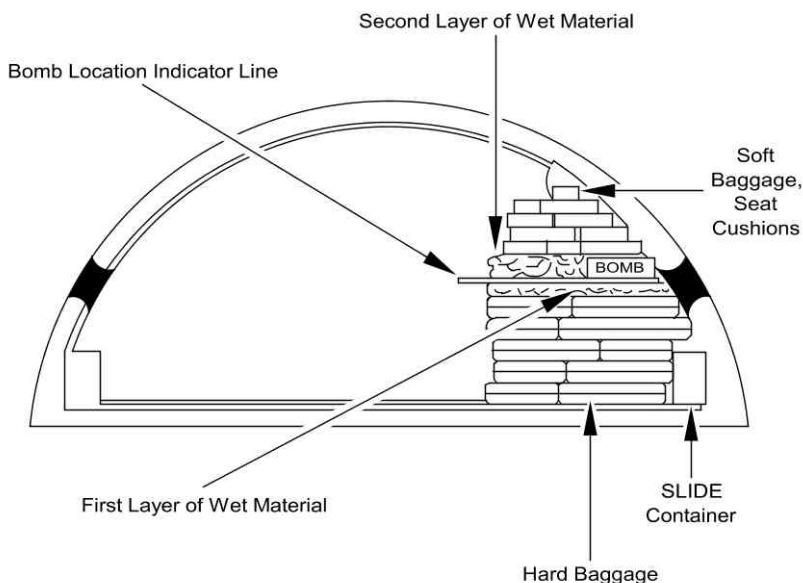
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



PASSENGERS.....MOVE/ADVISE


*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
<i>Evacuate through normal and emergency exits on the opposite side of the “bomb” location. Do not use the door just opposite the “bomb”.</i>		
<i>Use all available airport facilities to disembark without delay.</i>		





## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS..... MAX AVAIL

GND SPLR.....ARM

MAX BRK PR..... 1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE



	FORCED LANDING (Cont'd)	
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ELT..... CHECK EMITTING <i>If not, switch on the transmitter.</i>		
■ <b>If Evacuation not required:</b>		
CABIN CREW and PASSENGERS (PA)..... NOTIFY		

## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


### WHEN DESCENT ESTABLISHED

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

**CAUTION** Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: The recommendation is to descend with the autopilot engaged.  
 Use of the autopilot is also permitted in EXPEDITE mode .

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

*Use the ECAM flap setting, if required for abnormal operations. In all other cases :*

- FULL is preferred for optimized landing performance
- If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.

*In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.*

Note:     *For weights greater than 70 000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 kt). Consequently, on the FCU, the crew must select a speed below 200 kt before setting FLAPS 2. When in FLAPS 2, the crew can use managed speed again.*

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

*Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.*

● **In the final approach stages**

TARGET SPEED..... VLS

*Reduce the selected speed on the FCU to reach VLS at runway threshold.*

*Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).*

● **At main landing gear touchdown**

REVERSE THRUST..... USE MAX AVAILABLE

● **After nosewheel touchdown**

BRAKES.....APPLY AS NECESSARY

*Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.*

● **Landing complete**

BRAKE FANS  ..... ON

*Be prepared for tire deflation, if temperatures exceed 800 °C.*

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	83	81	78	74	71	66	62	58
15	83	81	78	74	71	66	62	58
20	83	81	78	74	71	66	61	56
25	83	81	78	74	70	64	59	
30	83	81	78	73	67			
35	83	81	76	70	65			
40	83	80	73	67				
45	82	76	70					
50	79	73						
55								

## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

NOSE DOWN PITCH CONTROL..... APPLY  
*This will reduce angle of attack*

*Note:*     *In case of lack of pitch down authority, reducing thrust may be necessary.*

BANK..... WINGS LEVEL

● **When out of stall (no longer stall indications) :**

THRUST..... INCREASE SMOOTHLY AS NEEDED

*Note:*     *In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

SPEEDBRAKES..... CHECK RETRACTED

FLIGHT PATH..... RECOVER SMOOTHLY

● **If in clean configuration and below 20 000 ft:**

FLAP 1..... SELECT

*Note:*     *If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

THRUST..... TOGA

At the same time:

PITCH ATTITUDE..... 15 °

BANK..... WINGS LEVEL

*Note:*     *When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.*

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- If the aircraft enters a volcanic ash cloud:
 

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
PACK FLOW.....	HI

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

If airspeed is unreliable or lost,Refer to QRH ABN 34 Unreliable Speed Indication/ADR Check Proc procedure.

Note: If all engines flame out and speed indications are lost,Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

Due to the increased noise level, pay particular attention to visual warnings.





## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.





## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*

Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

**WINDSHIELD/WINDOW ARCING**

Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)



## WINDSHIELD/WINDOW CRACKED

DIAGNOSIS OF INNER PLY.....PERFORM

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL..... 230/MEA

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

CAB PRESS MODE SEL..... MAN

MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


CAB PRESS MODE SEL..... AUTO

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

CAB PRESS MODE SEL..... MAN

MAN V/S CTL..... FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

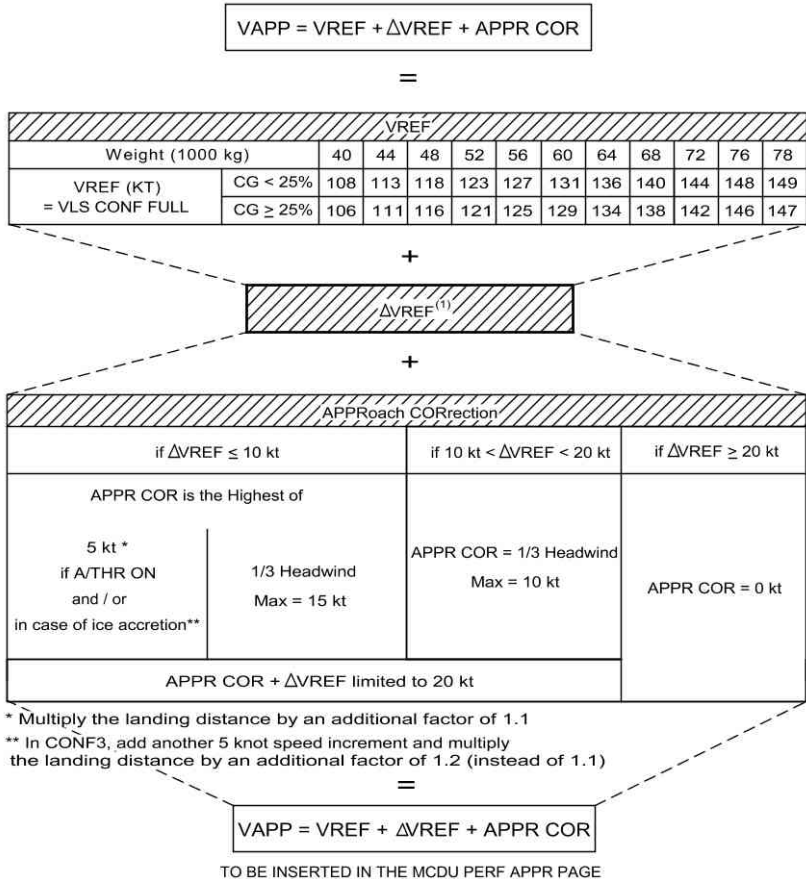
 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>80.13</b>
		30 MAR 12

<b>ECAM ADVISORY CONDITIONS</b>
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SYSTEM	CONDITIONS	RECOMMENDED ACTION
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY (OFF)
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.
OXY	Cockpit oxygen bottle pressure < 600 PSI.	If mask is not being used, check if it is correctly stowed.
APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <u>Low Speed</u>- Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <u>High Speed</u>- Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).

## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



(1) Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:


Failure : ALTN LAW  
 Flight Conditions : Autothrust ON, ice accretion  
 Landing Configuration : CONF 3  
 Headwind : 12 kt  
 Landing Weight/CG : 48 t/25 %  
 VREF determined from the landing weight : 116 kt  
 VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt} / 3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 116 + 10 + 10 = 136$  kt

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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors "WITHOUT REV"** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors "WITH REV"** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note: *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)

Compute the LDG DIST:


- Determine the applicable LDG DIST factors in the same column ("WITH REV." or "WITHOUT REV.")
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways / A/THR ON / No wind / WITHOUT REV./Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.75
	3	6			1.90
	3	10			1.40×1.90×1.1=3.00
RESULT	3	10			


$VREF = 131\text{ kt.}$  Therefore  $VAPP = 131 + 10 + 5 = 146\text{ kt.}$



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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	25			1.95*
RESULT	3	25			1.95

VREF = 140 kt. Therefore VAPP =140+25 =165 kt

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.45	1.35 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	3.25 3.15	3.25 3.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	2.00 2.15	N/A N/A
	EMER ELEC CONF	3	10	3.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	25	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.30*
	S>3	3	5	1.30*	1.20*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.50 1.50	1.50 1.50
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.25 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.45	1.40 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.35	1.30 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.45 1.60
	SEC 1+2+3 FAULT	3	10	1.60	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*



*Continued from the previous page*

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.40	1.35 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.30	1.25 1.30
	GREEN + BLUE	3	25	1.85	1.85
	GREEN + YELLOW	3	25	2.80	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.75	1.75 1.75
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	if there is ice accretion				
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.30 1.40
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	2.30 2.45	1.90 2.05
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	2.40 2.55	2.35 2.50
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.60 1.75
NAV	IR 1+2+3 FAULT	3	10	2.60	2.60
	DUAL IR FAULT/DUAL ADR FAULT	3	10	1.35*	1.30*
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.35*	1.30*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.30 1.40
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.30	1.20 1.30
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.40 2.40	2.40 2.40
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.50 1.60	N/A N/A
	EMER ELEC CONF	3	10	2.40	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.25*	1.90*
	FLAPS<1				
	S<1	3	45	2.15*	1.85*
	S≥1	3	25	1.70*	1.45*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.55*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.60*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.60*	1.40*
	1≤S≤3	3	10	1.35*	1.20*
	S>3	3	5	1.25*	1.15*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.20 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.65 1.80	1.65 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.45 1.55
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.25 1.40
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.70	1.30 1.45
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV. <sup>(c)</sup>	WET WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.50	1.30 1.45
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	GREEN + BLUE	3	25	2.05	2.00
	GREEN + YELLOW	3	25	2.15	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.85 1.90
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.15 1.30
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	2.25 2.45	1.70 1.85
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	2.40 2.60	2.30 2.50
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.10 1.20
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.20 1.25
NAV	IR 1+2+3 FAULT	3	10	1.85	1.85
	DUAL IR FAULT/ DUAL ADR FAULT	3	10	1.35*	1.20*
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.35*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1  3	55 (APPR) 40 (THRESHOLD) 10	2.00*  1.35*	1.90*  1.35*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.40	1.15 1.25

- (a) Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- (b) Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- (c) In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- (d) In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.
- (e) The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.
- (f) Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.05 2.15	2.05 2.15
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	N/A N/A
	EMER ELEC CONF	3	10	2.15	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	1.85*
	FLAPS < 1				
	S<1	3	45	2.25*	1.75*
	S≥1	3	25	1.75*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.75*	1.40*
	S≥1	3	15	1.45*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.30*
	S≥1	3	10	1.35*	1.10*
	FLAPS=3				
	S<1	3	25	1.55*	1.30*
	1≤S≤3	3	10	1.30*	1.10*
	S>3	3	5	1.25*	1.05*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.15*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.60 1.80	1.60 1.80
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.05 1.20
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.40	1.20 1.35
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.10 1.25
	SEC 1+2+3 FAULT	3	10	1.90	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.10*



*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV. <sup>(c)</sup>	CONTA WITH REV.
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.25	1.00 1.10
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.35	1.15 1.30
	GREEN+BLUE	3	25	1.95	1.90
	GREEN + YELLOW	3	25	2.10	N/A
	BLUE + YELLOW <sup>(b)</sup>	FULL 3	- 6	1.75 1.90	1.70 1.80
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	BRK RELEASED <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.20
	ALTN L(R) RELEASED <sup>(b)</sup> if NORM BRK FAULT	FULL 3	- 6	3.35 3.90	1.60 1.75
	ALTN L(R) RELEASED <sup>(b)</sup> if G SYS LO PR	FULL 3	- 6	3.45 3.95	3.30 3.65
	NORM BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.00 1.10
	NORM + ALTN BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
NAV	IR 1+2+3 FAULT	3	10	1.45	1.45
	DUAL IR FAULT/DUAL ADR FAULT	3	10	1.30*	1.10
	ALL ADR OFF	3	NOT APPLICABLE <sup>(d)</sup>	1.30*	1.10*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(e)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.05* 1.30*	1.90* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.35	1.05 1.15


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> In the case of a failure of all ADRs, the backup speed scale is activated.  
For approach speed, fly the bug.

<sup>(e)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.


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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.



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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
	AIR PACK 1(2) REGUL FAULT	ACSC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B W21 and W22 on 122VU</li> <li>- Pull C/B X21 and X22 on 122VU</li> <li>- Pull C/B Y18, Y20 and Y21 on 122VU</li> <li>- Pull C/B D8 on 49VU</li> <li>- Wait 5 s before pushing all the C/Bs.</li> </ul>





*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	AUTO FLT FCU 1(2) FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>







*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT and/or Loss of Passenger Address and/or Loss of Cabin Interphone	CIDS	<p><b>Confirm if spurious:</b></p> <ul style="list-style-type: none"> <li>- Check PA function</li> <li>- Check Cabin Interphone function</li> <li>- Check Cabin Lighting function</li> </ul> <p>If spurious, reset the CIDS when aircraft is self powered (APU or engine).</p> <p><b>On ground or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: P13  and P14  on 121VU, G01 and G02 on 49VU, M05 and, M06 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: M05, M06, G01, G02, P13 , P14 .</li> <li>- After CIDS reset, wait approximately 4 min before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:             <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M06 on 121VU.</li> </ul> </li> <li>• IF UNSUCCESSFUL:             <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M05 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M06, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: H01 on 49VU, Q14 on 121VU.</li> <li>- Wait 10 s, then:</li> <li>- Push the C/Bs in the following order: Q14, H01.</li> </ul>
24	GPU cannot be connected to the aircraft	GAPCU	<p><b>On ground only:</b></p> <p>The GPU cannot be connected to the electrical network of the aircraft (AVAIL light is OFF):</p> <ul style="list-style-type: none"> <li>• If at least one power source (IDG 1 or 2, APU GEN or batteries) is connected to the electrical network of the aircraft.             <ul style="list-style-type: none"> <li>- Reset the EXT PWR pb on 35VU (Press and release)</li> </ul> </li> <li>• If no power source is connected to the electrical network of the aircraft.             <ul style="list-style-type: none"> <li>- Set the BAT 1 pb-sw and BAT 2 pb-sw to AUTO.</li> </ul> </li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
26	SMOKE DET FAULT	CIDS-SDF	<b><u>On ground or in flight:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C05 and C06 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>
	SMOKE LAVATORY DET FAULT with all lavatories declared inoperative on the FAP	CIDS or CIDS-SDF	<b><u>On ground or in flight:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs P13 and P14  on 121VU, G01 and G02 on 49VU, M05 or M06 or M07 on 121VU.</li> <li>- Wait 5 s, then</li> <li>- Push the C/Bs in the following order: M05 or M06 and M06 or M07 on 121VU, G01 and G02 on 49VU, P13 and P14  ; on 121VU.</li> </ul> <b><u>If unsuccessful, on ground only:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C06 and C05 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>
	SMOKE FWD (AFT) CARGO DET FAULT SMOKE FWD (AFT) CRG 1 / 2 BTL FAULT	CIDS-SDF	<b><u>On ground:</u></b> Apply the following actions in the presented order: <ul style="list-style-type: none"> <li>- Pull the C/Bs C05 and C06 on 49VU, T17 and T18 on 122VU.</li> <li>- Wait 5 s, then</li> <li>- Push simultaneously the C/Bs C05 and C06 on 49VU</li> <li>- Within 2 s push simultaneously the C/Bs T17 and T18 on 122VU.</li> </ul>





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><u>Note:</u> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><u>Note:</u> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><u>Note:</u></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><u>Note:</u></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><u>Note:</u></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication or Simultaneous triggering of FUEL L XFR VALVE CLOSED and FUEL R XFR VALVE CLOSED, although FUEL SD indicates no anomaly.	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the 3 C/B:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li><li>• Channel 1 and 2 (L26 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the 3 C/B.</li></ul> <p><u>Note:</u> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	BRAKES SYS 1(2) FAULT or BRAKES BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><u>Note:</u>    After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>    After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	WHEEL N.W STEER FAULT or WHEEL N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>    After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	L/G LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:             <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:             <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<u>On ground only:</u> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
	ISIS malfunction	ISIS	<u>On ground only:</u> With aircraft not moving: <ul style="list-style-type: none"> <li>- Pull C/B F12 on 49VU,</li> <li>- Wait 5 s, then push the C/B,</li> <li>- Normal operation is expected after approximately 2 min.</li> </ul> <p><i>Note:</i> In the case of small aircraft motion during the C/B reset (refueling, cargo loading conditions, etc.), the ATT red flag may appear on the ISIS. In this case, press the RST P/B for 2 s, and wait 2 min to recover normal operation.</p>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus. <p><u>On ground, or in flight:</u></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

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# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

- **LHS Captain is PF. During the C-TWO + briefing review:**

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

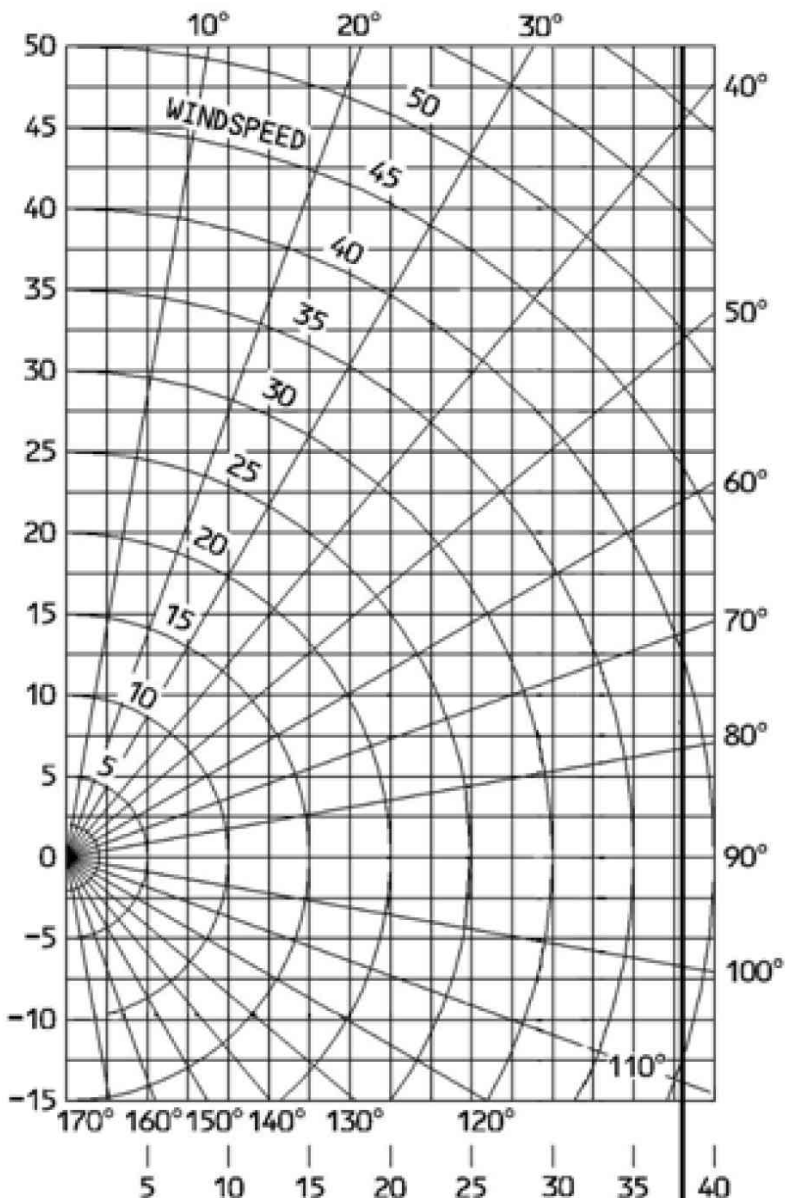
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A320



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
30 knots headwind  
20 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A320E

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT		01	
	EMER ELEC CONFIG		08		if there is ice accretion			
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		BRK RELEASED		02	
			S ≥ 1		03	ALTN L(R) RELEASED if NORM BRK FAULT		03
	1 ≤ FLAPS < 2	S < 1	04		ALTN L(R) RELEASED if G SYS LO PR		04	
			S ≥ 1		05	NORM BRK FAULT		05
	2 ≤ FLAPS < 3	S < 1	06		NORM + ALTN BRK FAULT		06	
			S ≥ 1	07	NAV	IR 1+2+3 FAULT		01
	FLAP = 3	S < 1	08	DUAL IR FAULT/DUAL ADR FAULT		02		
		1 ≤ S ≤ 3	09	ALL ADR OFF		03		
		S > 3	10	BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01	
	FLAP > 3	S < 1	11		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	12			REV UNLOCK with buffet (CONF 3)		02
		S > 3	13	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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**IN FLIGHT PERFORMANCE**

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SPEEDS

OPERATING SPEEDS (KT)					
CG ≥ 25 %					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
40	117	152	160	109	106
44	122	159	168	114	111
48	128	166	176	119	116
52	133	173	184	124	121
56	138	179	192	128	125
60	143	185	200	133	129
64	148	192	208	137	134
68	152	197	216	142	138
72	157	203	224	146	142
76	161	209	232	150	146
78	163	211	236	152	147

(1) Above FL 200 add 1 kt per additional 1 000 ft.

For CG < 25 % add 2 kt to VLS and VREF

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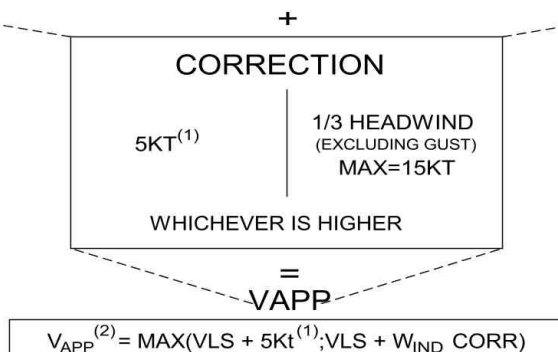
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

Note: For CG < 25 %, add 2 kt to VLS CONF FULL and VLS CONF 3.

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VLS CONF FULL (KT)	106	111	116	121	125	129	134	138	142	146	147
VLS CONF 3 (KT)	109	114	119	124	128	133	137	142	146	150	152



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

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LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		730	760	800	840	890	970	1060	1160	1250
	WET		970	1040	1110	1180	1260	1340	1420	1500	1580
	COVERED WITH	STANDING WATER	1270	1360	1440	1560	1690	1810	1940	2070	2180
		SLUSH	1230	1310	1400	1480	1570	1660	1780	1900	2000
		COMPACTED SNOW	1230	1310	1380	1460	1540	1620	1690	1770	1830
		ICE	2320	2480	2650	2810	2970	3140	3300	3470	3600

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+17 %	+21 %	+24 %	+22 %	+16 %	+24 %
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+3 %
2 reversers operative	-5 %	-12 %	-15 %	-14 %	-12 %	-27 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note:    -    THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 890 m

Read from the Corrections table,  
Pressure altitude correction: 3 x 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 890 x 1.06 x 1.08 = 1 020 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)			46	50	54	58	62	66	70	74	78
RUNWAY CONDITION	DRY		690	730	760	790	830	890	980	1070	1150
	WET		890	950	1010	1080	1150	1220	1290	1360	1420
	COVERED WITH	STANDING WATER	1170	1250	1330	1420	1530	1630	1740	1850	1950
		SLUSH	1130	1210	1290	1370	1450	1530	1620	1720	1800
		COMPACTED SNOW	1140	1220	1290	1360	1430	1500	1570	1650	1700
		ICE	2030	2170	2310	2450	2600	2740	2880	3030	3150

CORRECTION ON ACTUAL LANDING DISTANCE							
RUNWAY CONDITION	dry runway	wet runway	runway covered with				
			standing water	slush	compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed						
per 10 kt tailwind	+18 %	+21 %	+22 %	+20 %	+17 %	+25 %	
forward C.G.	+2 %	+3 %	+3 %	+3 %	+3 %	+2 %	
2 reversers operative	-5 %	-11 %	-14 %	-13 %	-11 %	-24 %	
Per 5 kt speed increment (and no failure) add 8 % (all runways)							

*Note:*    - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 62 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 830 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS, no reversers) = 830 × 1.06 × 1.08 = 960 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND	FWD CG
RUNWAY CONDITION												
DRY		MED LOW	1290 1760	1410 1990	1530 2220	1660 2450	1780 2680	+3 +3	0 -2	+12 +16	-2 -3	+1 +2
WET		MED LOW	1300 1760	1450 1990	1620 2220	1800 2450	1970 2680	+4 +3	0 -2	+17 +16	-3 -3	+2 +2
COVERED WITH	STANDING WATER	MED LOW	1500 1740	1740 1960	2010 2210	2300 2490	2590 2760	+5 +4	-13 -2	+21 +17	-4 -3	+3 +1
		SLUSH	MED LOW	1470 1700	1640 1910	1860 2120	2120 2360	2380 2600	+5 +5	-13 -1	+21 +16	-4 -3
	COMPACTED SNOW		MED LOW	1470 1730	1620 1940	1770 2160	1930 2390	2070 2600	+4 +4	-11 -1	+16 +15	-3 -3
		ICE	MED LOW	2520 2550	2900 2930	3280 3320	3680 3710	4040 4080	+5 +5	-28 -24	+23 +23	-5 -5

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)							CORRECTIONS (%) ON LANDING DISTANCE					
WEIGHT (1000 KG)		MODE	40	50	60	70	80	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	FWD CG
RUNWAY CONDITION												
DRY		MED	1170	1310	1440	1560	1670	+3	0	+13	-3	+2
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
WET		MED	1170	1310	1470	1620	1760	+4	0	+17	-4	+3
		LOW	1600	1830	2060	2280	2480	+3	0	+16	-3	+2
COVERED WITH	STANDING WATER	MED	1330	1530	1770	2010	2240	+4	-11	+21	-5	+3
		LOW	1570	1800	2030	2250	2480	+4	-1	+16	-3	+2
	SLUSH	MED	1290	1470	1660	1870	2070	+5	-10	+20	-5	+3
		LOW	1530	1750	1970	2180	2380	+4	-1	+16	-3	+2
	COMPACTED SNOW	MED	1310	1470	1620	1760	1880	+4	-9	+16	-4	+3
		LOW	1560	1780	2000	2210	2410	+4	-1	+16	-3	+2
	ICE	MED	2130	2480	2820	3150	3460	+5	-25	+25	-5	+3
		LOW	2160	2510	2850	3190	3490	+5	-19	+24	-5	+2

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 7 % (ALL RUNWAYS).

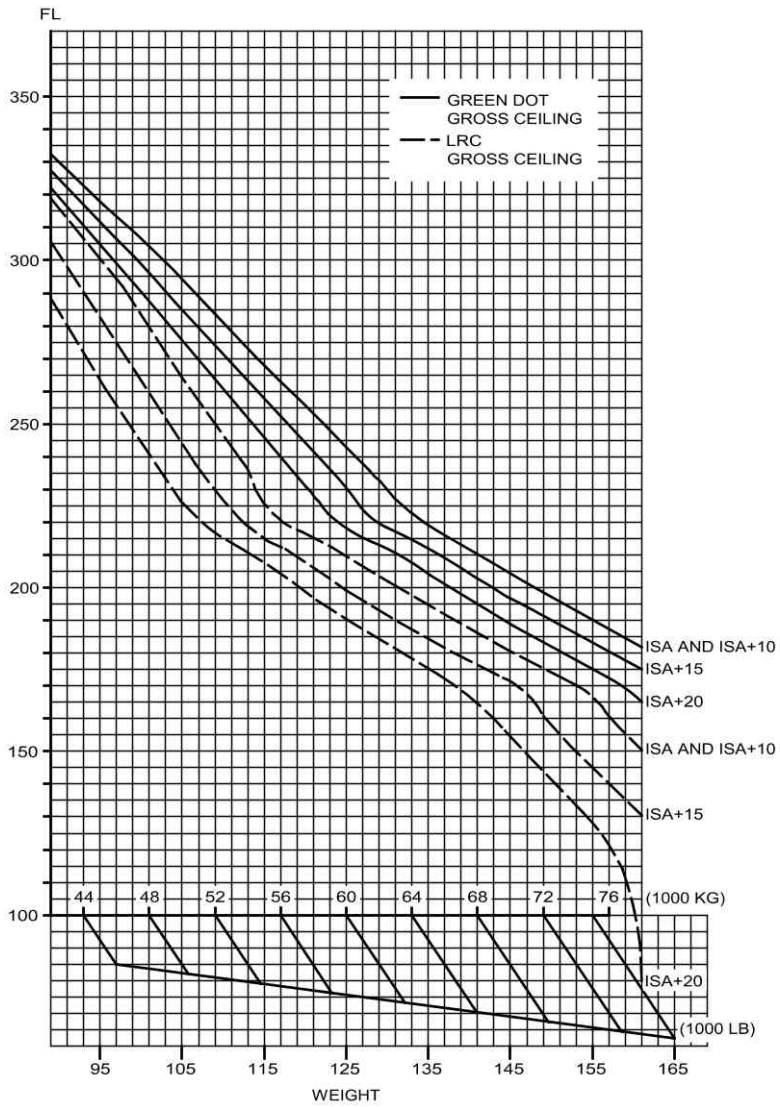




## CEILINGS

### ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA AND ISA + 10	ISA + 15 AND ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-4 000 ft
	TOTAL ANTI ICE ON	-2 700 ft	-7 400 ft
GREEN DOT	ENGINE ANTI ICE ON	- 700 ft	- 900 ft
	TOTAL ANTI ICE ON	-1 700 ft	-2 100 ft

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT										
MAX. CONTINUOUS THRUST LIMITS				ISA		DISTANCE (NM)		TIME (MIN)		
HIGH AIR CONDITIONING				CG=33.0%		INITIAL SPEED (KT)		FUEL (1000KG)		
ANTI ICE OFF				LEVEL OFF (FT)						
INIT. GW	INITIAL FLIGHT LEVEL									
(1000KG)	250	290	310	330	350	370	390			
50			154 30 191 0.8 30000	215 42 193 1.0 30100	251 48 195 1.2 30100	278 53 197 1.3 30200	300 57 199 1.3 30200			
52		97 19 193 0.5 28700	208 41 195 1.1 29000	252 49 197 1.2 29100	282 54 199 1.4 29200	305 58 201 1.4 29200	325 61 203 1.5 29300			
54		172 34 197 0.9 27900	238 47 199 1.2 28000	274 53 201 1.4 28100	301 58 203 1.5 28200	321 61 205 1.6 28200	341 64 207 1.6 28200			
56		203 40 201 1.1 26900	258 51 203 1.4 27000	289 56 205 1.5 27100	315 60 207 1.6 27200	336 64 209 1.7 27200	352 66 211 1.7 27200			
58		171 33 205 1.0 26500	214 41 207 1.2 26500	244 47 209 1.3 26500	268 51 211 1.4 26500	287 54 213 1.4 26600	306 57 215 1.5 26600			
60		166 32 209 0.9 26000	201 38 211 1.1 26100	227 43 213 1.2 26100	249 47 215 1.3 26100	268 50 217 1.4 26100	284 52 219 1.4 26100			
62		165 31 213 1.0 25700	195 37 215 1.1 25700	218 41 217 1.2 25700	239 44 219 1.3 25700	256 47 221 1.3 25700	272 49 223 1.4 25800			
64		165 31 217 1.0 25300	192 36 219 1.1 25400	214 39 221 1.2 25400	232 42 223 1.3 25400	249 45 225 1.3 25400	264 47 227 1.4 25400			
66	51 10 217 0.3 24900	165 31 221 1.0 25000	188 35 223 1.1 25000	210 38 225 1.2 25000	226 41 227 1.2 25100	242 43 229 1.3 25100	257 45 231 1.3 25100			
68	129 24 221 0.9 24400	207 38 225 1.3 24500	228 42 227 1.4 24600	246 45 229 1.5 24600	261 47 231 1.5 24600	277 49 233 1.5 24600	290 51 235 1.6 24600			
70	162 30 225 1.1 23800	230 42 229 1.5 23900	250 46 231 1.6 24000	268 48 233 1.6 24000	282 50 235 1.7 24000	298 53 237 1.7 24000				
72	185 34 229 1.3 23200	245 45 233 1.6 23300	265 48 235 1.7 23400	282 51 237 1.7 23400	296 53 239 1.8 23400	310 55 241 1.8 23400				
74	205 38 233 1.4 22700	257 47 237 1.7 22700	275 49 239 1.8 22800	293 52 241 1.9 22800	307 54 243 1.9 22800	321 56 245 1.9 22800				
76	220 40 237 1.6 22100	268 48 241 1.8 22200	286 51 243 1.9 22200	300 53 245 1.9 22200	316 56 247 2.0 22200	331 58 249 2.0 22200				
78	252 46 241 1.8 21400	295 53 245 2.0 21500	312 55 247 2.1 21500	326 58 249 2.2 21600	339 59 251 2.2 21600					
CORRECTIONS		ENGINE ANTI ICE ON				TOTAL ANTI ICE ON				
FUEL		+ 14 %				+ 28 %				
TIME		+ 13 %				+ 26 %				
DISTANCE		+ 12 %				+ 23 %				
LEVEL OFF		- 700 ft				- 1800 ft				

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b>
		30 MAR 12

## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)	MACH IAS (KT)		
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.151 .430 1811 237	1.236 .511 1968 258	1.267 .515 1792 240	1.316 .550 1841 247	1.344 .556 1777 239	1.393 .584 1801 241	
<b>52</b>	1.158 .435 1879 240	1.240 .511 1987 257	1.292 .535 1907 250	1.327 .553 1881 248	1.363 .567 1855 244	1.412 .594 1874 246	
<b>54</b>	1.170 .447 1983 247	1.245 .510 2011 257	1.312 .550 1999 256	1.338 .555 1925 249	1.385 .581 1947 251	1.431 .602 1942 249	
<b>56</b>	1.183 .461 2098 255	1.250 .510 2040 257	1.323 .553 2044 258	1.355 .565 2001 253	1.404 .592 2024 255	1.440 .600 1963 248	
<b>58</b>	1.226 .510 2373 283	1.260 .514 2095 259	1.333 .555 2086 259	1.374 .576 2086 259	1.417 .595 2071 257	1.444 .585 1952 242	
<b>60</b>	1.233 .514 2415 285	1.270 .519 2156 261	1.346 .561 2145 262	1.394 .588 2174 264	1.420 .585 2065 252	1.452 .562 1935 232	
<b>62</b>	1.236 .514 2434 285	1.294 .540 2287 272	1.362 .570 2225 266	1.410 .596 2248 268	1.426 .570 2055 246		
<b>64</b>	1.239 .513 2454 284	1.311 .552 2382 279	1.381 .582 2317 272	1.418 .595 2272 267	1.435 .544 2037 234		
<b>66</b>	1.243 .513 2476 284	1.322 .556 2432 281	1.397 .591 2399 277	1.421 .585 2264 263			
<b>68</b>	1.247 .512 2499 283	1.330 .558 2472 282	1.412 .599 2473 280	1.426 .570 2253 256			
<b>70</b>	1.254 .514 2550 285	1.338 .560 2516 283	1.426 .604 2537 283	1.436 .543 2232 243			
<b>72</b>	1.262 .517 2604 287	1.351 .567 2592 286	1.428 .598 2533 280				
<b>74</b>	1.270 .521 2666 289	1.365 .575 2673 290	1.432 .587 2523 274				
<b>76</b>	1.290 .539 2805 299	1.381 .585 2767 296	1.438 .571 2509 267				
<b>78</b>	1.308 .554 2927 307	1.395 .593 2850 300	1.450 .537 2478 250				
ENGINE ANTI ICE ON △FUEL = + 2.5 %				TOTAL ANTI ICE ON △FUEL = + 6 %			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>4/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6 MIN)									
REF. INITIAL WEIGHT = 55000 KG				ISA		FUEL CONSUMED (KG)			
PACK FLOW HI				CG = 33.0 %		TIME (H.MIN)			
ANTI-ICING OFF									
AIR	FLIGHT LEVEL						CORRECTION ON		
DIST.							FUEL CONSUMPTION		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1410 0.47	1187 0.44	1049 0.42	999 0.41	954 0.40	931 0.40	9	5	4
300	2101 1.09	1816 1.03	1627 1.00	1559 0.59	1499 0.57	1469 0.57	15	11	10
400	2785 1.30	2442 1.22	2203 1.17	2116 1.16	2042 1.14	2004 1.13	20	16	15
500	3463 1.52	3066 1.40	2776 1.35	2669 1.34	2581 1.31	2535 1.30	26	22	20
600	4136 2.14	3688 1.59	3346 1.53	3219 1.52	3118 1.48	3063 1.47	31	28	26
700	4801 2.36	4307 2.18	3913 2.11	3766 2.09	3652 2.05	3588 2.04	37	33	31
800	5460 2.58	4924 2.37	4477 2.28	4309 2.27	4183 2.22	4110 2.20	42	39	37
900	6114 3.20	5540 2.55	5040 2.46	4849 2.45	4710 2.39	4629 2.37	47	44	43
1000	6761 3.43	6153 3.14	5600 3.04	5386 3.03	5233 2.56	5146 2.54	51	49	48
1100	7403 4.05	6764 3.33	6157 3.22	5920 3.21	5753 3.14	5660 3.11	56	55	54
1200	8046 4.28	7373 3.52	6712 3.40	6451 3.39	6269 3.31	6173 3.28	61	60	60
1300	8686 4.49	7980 4.10	7265 3.58	6979 3.57	6783 3.49	6682 3.45	65	65	66
1400	9323 5.11	8586 4.29	7812 4.17	7504 4.15	7293 4.07	7189 4.02	70	70	72
ENGINE ANTI ICE ON △FUEL = + 3 %					TOTAL ANTI ICE ON △FUEL = + 6 %				

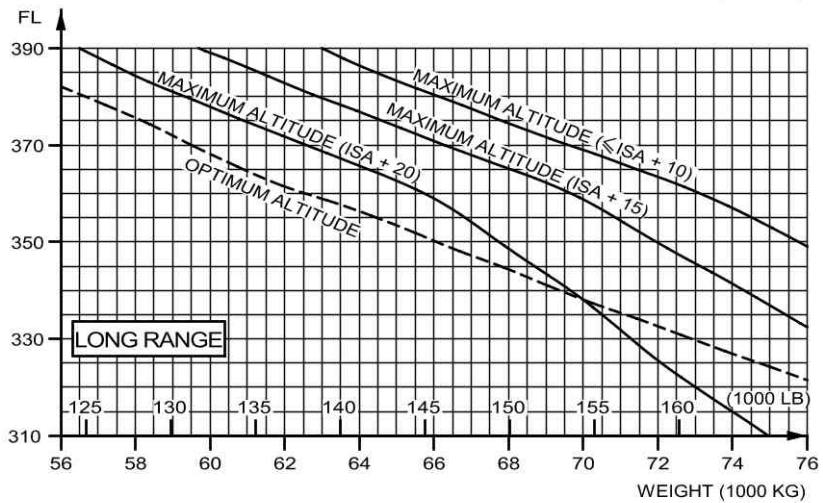
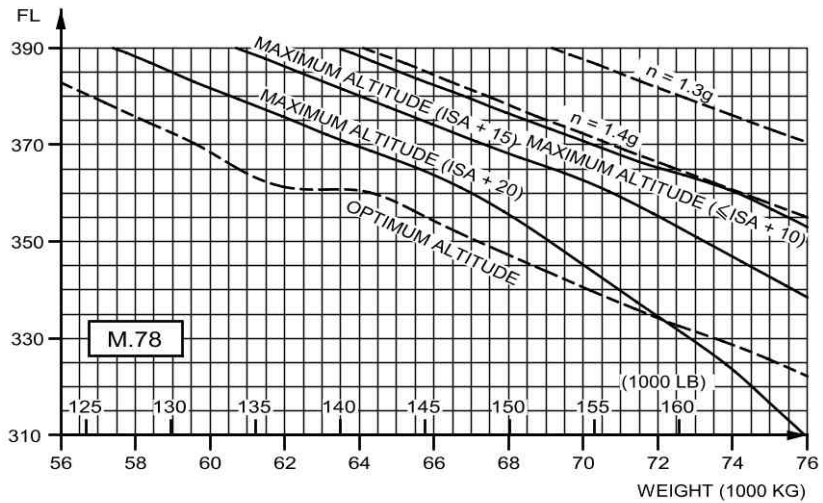
PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NO-04-08-140





## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 900 ft Opt ALT : No corr.	Max ALT : -1 700 ft Opt ALT : No corr.
ISA +15	Max ALT : -1 400 ft Opt ALT : No corr.	Max ALT : -2 800 ft Opt ALT : -1 400 ft
ISA +20	Max ALT : -1 700 ft Opt ALT : -1 500 ft	Max ALT : -2 800 ft Opt ALT : -2 000 ft

IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	933 0.36	879 0.36	834 0.36	792 0.36	757 0.36	739 0.36	0	1	3
400	2069 1.02	1951 1.02	1858 1.03	1774 1.03	1704 1.03	1692 1.03	5	9	20
600	3202 1.28	3016 1.28	2873 1.29	2748 1.30	2642 1.30	2628 1.30	9	17	33
800	4331 1.54	4074 1.55	3881 1.55	3714 1.56	3572 1.57	3550 1.57	13	24	45
1000	5456 2.20	5124 2.21	4881 2.22	4673 2.23	4492 2.23	4458 2.23	17	32	57
1200	6579 2.46	6168 2.47	5874 2.48	5624 2.50	5403 2.50	5352 2.50	20	39	67
1400	7699 3.12	7206 3.13	6859 3.15	6569 3.16	6306 3.17	6232 3.17	23	46	77
1600	8817 3.37	8245 3.39	7838 3.41	7505 3.43	7202 3.44	7101 3.44	26	53	87
1800	9932 4.03	9279 4.05	8812 4.07	8432 4.09	8093 4.11	7957 4.11	28	59	95
2000	11044 4.29	10308 4.32	9778 4.34	9353 4.36	8978 4.37	8803 4.37	30	65	103
2200	12154 4.55	11332 4.58	10738 5.00	10266 5.03	9855 5.04	9637 5.04	31	71	110
2400	13262 5.21	12355 5.24	11692 5.27	11173 5.29	10726 5.31	10460 5.31	33	77	117
2600	14367 5.47	13380 5.50	12640 5.53	12072 5.56	11590 5.58	11274 5.58	34	83	123
2800	15469 6.13	14403 6.16	13582 6.19	12966 6.23	12448 6.25	12078 6.25	35	87	130
3000	16570 6.39	15422 6.42	14519 6.46	13853 6.49	13300 6.51	12888 6.51	36	92	136
LOW AIR CONDITIONING △FUEL = - 0.4 %			ENGINE ANTI ICE ON △FUEL = + 3 %			TOTAL ANTI ICE ON △FUEL = + 5.5 %			

PROGRAM : FLIP23C 17.07.97 ; AERO : A320-232 01/06/97 ; MOTO : A320-233 15/10/97 ; GENE : A320-232 01/10/97 END OF FLIP CL-NQ-04-10-140

COST INDEX FOR LONG RANGE CRUISE SPEED

ALL ENGINES

- For a quick determination of the  $CI_{LRC}$ , use:
- $CI_{LRC}$  = 40 kg/min in the FMGC.
  - or
  - $CI_{LRC}$  = 55 (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)									
	45				65				
	TIME	FUEL	DIST.	EPR	TIME	FUEL	DIST.	EPR	IAS
FL	(MIN)	(KG)	(NM)		(MIN)	(KG)	(NM)		(KT)
390	16.1	188	98	1.047	19.0	192	114	IDLE	241
370	14.6	158	87	1.066	18.2	185	108	IDLE	252
350	13.5	139	78	IDLE	17.5	178	102	IDLE	264
330	12.9	134	74	IDLE	16.8	171	97	IDLE	277
310	12.4	129	71	IDLE	16.1	166	93	IDLE	289
290	12.0	125	67	IDLE	15.5	160	88	IDLE	300
270	11.4	120	63	IDLE	14.7	153	82	IDLE	300
250	10.8	115	58	IDLE	13.9	146	76	IDLE	300
240	10.5	112	56	IDLE	13.5	143	73	IDLE	300
220	9.9	107	52	IDLE	12.7	136	67	IDLE	300
200	9.3	102	48	IDLE	11.8	129	62	IDLE	300
180	8.7	97	44	IDLE	11.0	122	56	IDLE	300
160	8.0	91	40	IDLE	10.1	114	50	IDLE	300
140	7.4	85	36	IDLE	9.2	106	45	IDLE	300
120	6.7	79	32	IDLE	8.3	97	39	IDLE	300
100	6.0	72	28	IDLE	7.4	88	34	IDLE	300
50	2.2	28	10	IDLE	2.7	34	12	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		LOW AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		-		+ 4 %		+ 18 %		+ 0.3 %	
FUEL		- 1 %		+ 17 %		+ 85 %		+ 0.4 %	
DISTANCE		-		+ 4 %		+ 18 %		+ 0.4 %	

10F - 08FOA320 - 233 IAE V2527-EA5 23100000C5KG330 0 018590 0 0 - 1 - 350.0 15.0 .00 0 03 .780300.000250.000 0 CL-N0 - 04 - 12 - 140

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 100 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 80 KG (4MIN)									
REF. LDG WT AT DEST. = 55000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR DIST. (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	529 0.12						2		
60	681 0.16						4		
80	832 0.20	803 0.20					5		
100	984 0.24	943 0.24	939 0.22				6	5	
120	1136 0.28	1084 0.27	1066 0.26	1072 0.25			7	6	
140	1289 0.32	1224 0.31	1192 0.29	1182 0.28			9	7	
160	1441 0.37	1365 0.35	1319 0.32	1291 0.32	1307 0.31		10	7	9
180	1594 0.41	1506 0.39	1446 0.35	1401 0.35	1409 0.34	1422 0.33	11	8	11
200	1747 0.45	1647 0.42	1573 0.38	1511 0.38	1511 0.37	1518 0.36	13	9	12
220	1900 0.49	1788 0.46	1700 0.42	1621 0.41	1613 0.40	1613 0.39	14	9	13
240	2054 0.53	1930 0.50	1828 0.45	1731 0.45	1715 0.43	1709 0.42	15	10	14
260	2207 0.57	2072 0.54	1955 0.48	1841 0.48	1817 0.46	1805 0.45	17	11	15
280	2361 1.01	2213 0.57	2082 0.51	1951 0.51	1920 0.49	1901 0.48	18	11	16
300	2515 1.05	2356 1.01	2210 0.54	2061 0.54	2022 0.52	1997 0.51	19	12	17
320	2669 1.09	2498 1.05	2337 0.58	2172 0.57	2125 0.56	2094 0.53	21	13	18
340	2823 1.13	2640 1.09	2465 1.01	2282 1.01	2228 0.59	2190 0.56	22	13	19
360	2978 1.17	2783 1.12	2592 1.04	2393 1.04	2330 1.02	2286 0.59	23	14	20
380	3133 1.21	2926 1.16	2720 1.07	2503 1.07	2433 1.05	2383 1.02	25	15	21
400	3288 1.25	3069 1.20	2848 1.10	2614 1.10	2537 1.08	2480 1.05	26	16	22
420	3443 1.29	3212 1.23	2975 1.14	2725 1.14	2640 1.11	2576 1.08	27	16	23
440	3598 1.33	3356 1.27	3103 1.17	2835 1.17	2743 1.14	2673 1.11	29	17	25
460	3754 1.37	3499 1.30	3231 1.20	2946 1.20	2846 1.17	2770 1.13	30	18	26
480	3909 1.41	3643 1.34	3359 1.23	3057 1.23	2950 1.20	2868 1.16	31	18	27
500	4065 1.45	3787 1.38	3487 1.26	3169 1.27	3054 1.23	2965 1.19	33	19	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 3 %			ΔFUEL = + 7 %			

CL-W0-04-13-140



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-CAB</b> <b>1/2</b> 30 MAR 12
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## IN CRUISE QUICK CHECK FL 100 LONG RANGE

### FLIGHT WITHOUT CAB PRESS

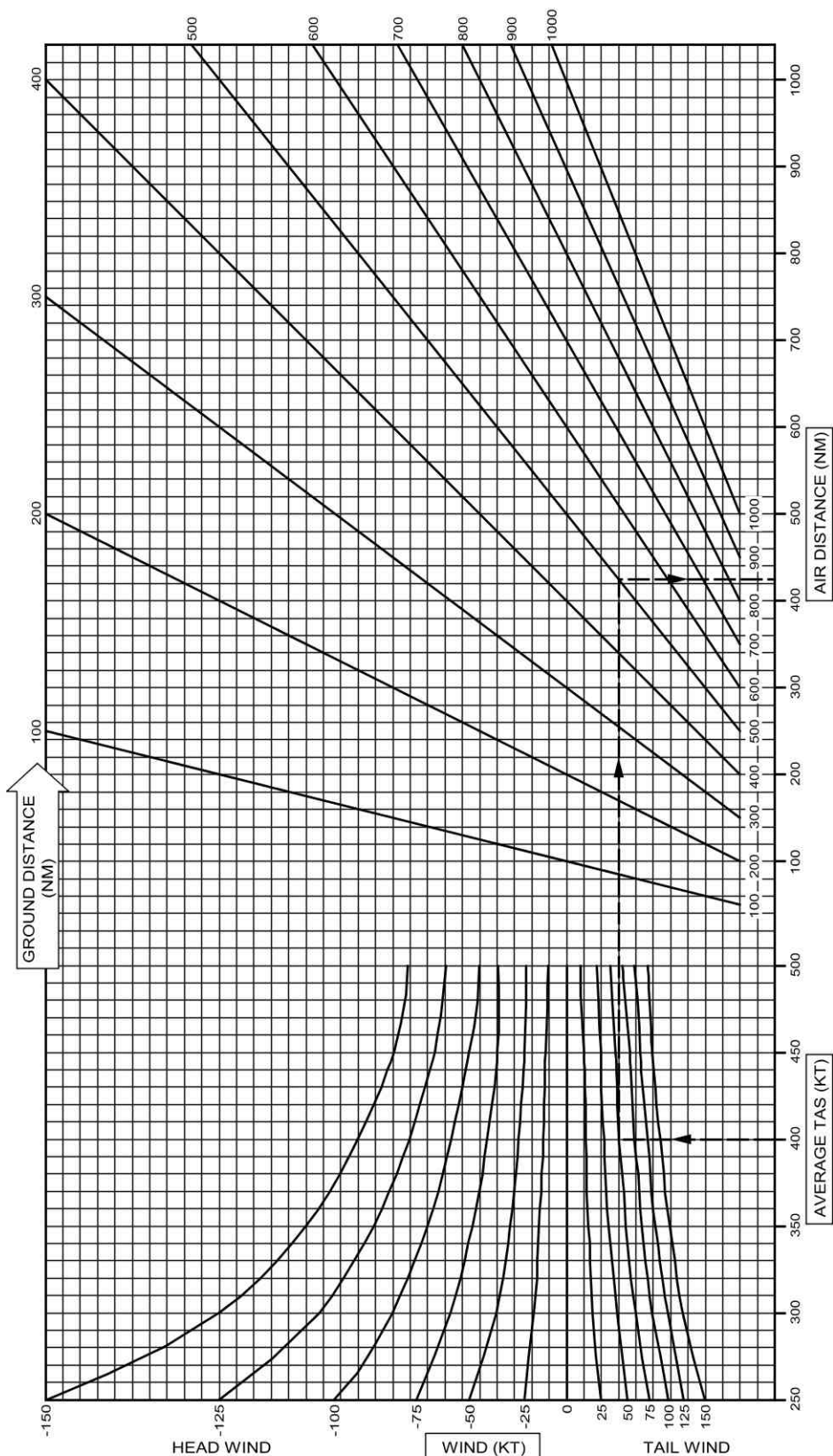
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 120 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING			ISA		FUEL CONSUMED (KG)		
ANTI-ICING OFF			CG = 25.0%		TIME (H.MIN)		
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	50	55	60	65	70	75	80
40	301 0.15	296 0.15	293 0.15	293 0.15	294 0.15	296 0.15	300 0.15
60	445 0.19	446 0.19	450 0.19	456 0.19	463 0.18	472 0.18	480 0.18
80	588 0.23	596 0.23	606 0.23	619 0.22	633 0.22	648 0.21	661 0.21
100	731 0.28	746 0.27	762 0.27	781 0.26	802 0.25	824 0.25	841 0.24
120	874 0.32	895 0.31	918 0.31	944 0.30	971 0.29	999 0.28	1021 0.27
140	1017 0.36	1045 0.35	1074 0.35	1106 0.34	1140 0.33	1174 0.31	1201 0.30
160	1160 0.41	1194 0.40	1229 0.39	1268 0.38	1309 0.36	1349 0.35	1381 0.34
180	1302 0.45	1343 0.44	1385 0.43	1430 0.42	1477 0.40	1524 0.38	1560 0.37
200	1444 0.50	1491 0.48	1540 0.47	1591 0.45	1645 0.44	1699 0.41	1740 0.40
220	1587 0.54	1640 0.52	1695 0.51	1752 0.49	1813 0.47	1873 0.45	1919 0.43
240	1728 0.58	1788 0.56	1849 0.55	1914 0.53	1981 0.51	2048 0.48	2098 0.46
260	1870 1.03	1936 1.00	2004 0.59	2074 0.57	2148 0.55	2222 0.52	2277 0.50
280	2012 1.07	2084 1.05	2158 1.03	2235 1.01	2316 0.58	2396 0.55	2456 0.53
300	2153 1.11	2232 1.09	2312 1.07	2396 1.05	2483 1.02	2570 0.58	2634 0.56
320	2294 1.16	2380 1.13	2466 1.11	2556 1.09	2650 1.06	2743 1.02	2813 0.59
340	2435 1.20	2527 1.17	2620 1.15	2716 1.12	2816 1.10	2917 1.05	2991 1.02
360	2576 1.25	2674 1.21	2773 1.19	2876 1.16	2983 1.13	3090 1.09	3169 1.06
380	2716 1.29	2821 1.26	2927 1.23	3035 1.20	3149 1.17	3263 1.12	3347 1.09
400	2856 1.33	2968 1.30	3080 1.27	3195 1.24	3315 1.21	3436 1.16	3525 1.12
420	2997 1.38	3114 1.34	3233 1.31	3354 1.28	3480 1.25	3609 1.19	3702 1.15
440	3137 1.42	3261 1.38	3385 1.35	3513 1.32	3646 1.28	3781 1.22	3880 1.19
460	3276 1.47	3407 1.43	3538 1.39	3672 1.36	3811 1.32	3954 1.26	4057 1.22
480	3416 1.51	3553 1.47	3690 1.43	3830 1.40	3977 1.36	4126 1.29	4235 1.25
500	3555 1.56	3699 1.51	3842 1.47	3989 1.44	4142 1.40	4298 1.33	4412 1.29
520	3695 2.00	3844 1.55	3994 1.51	4147 1.48	4306 1.43	4470 1.36	4588 1.32
540	3834 2.05	3990 2.00	4146 1.55	4305 1.51	4471 1.47	4642 1.40	4765 1.35
AIR CONDITIONING OFF △FUEL = - 1.5 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 6 %		

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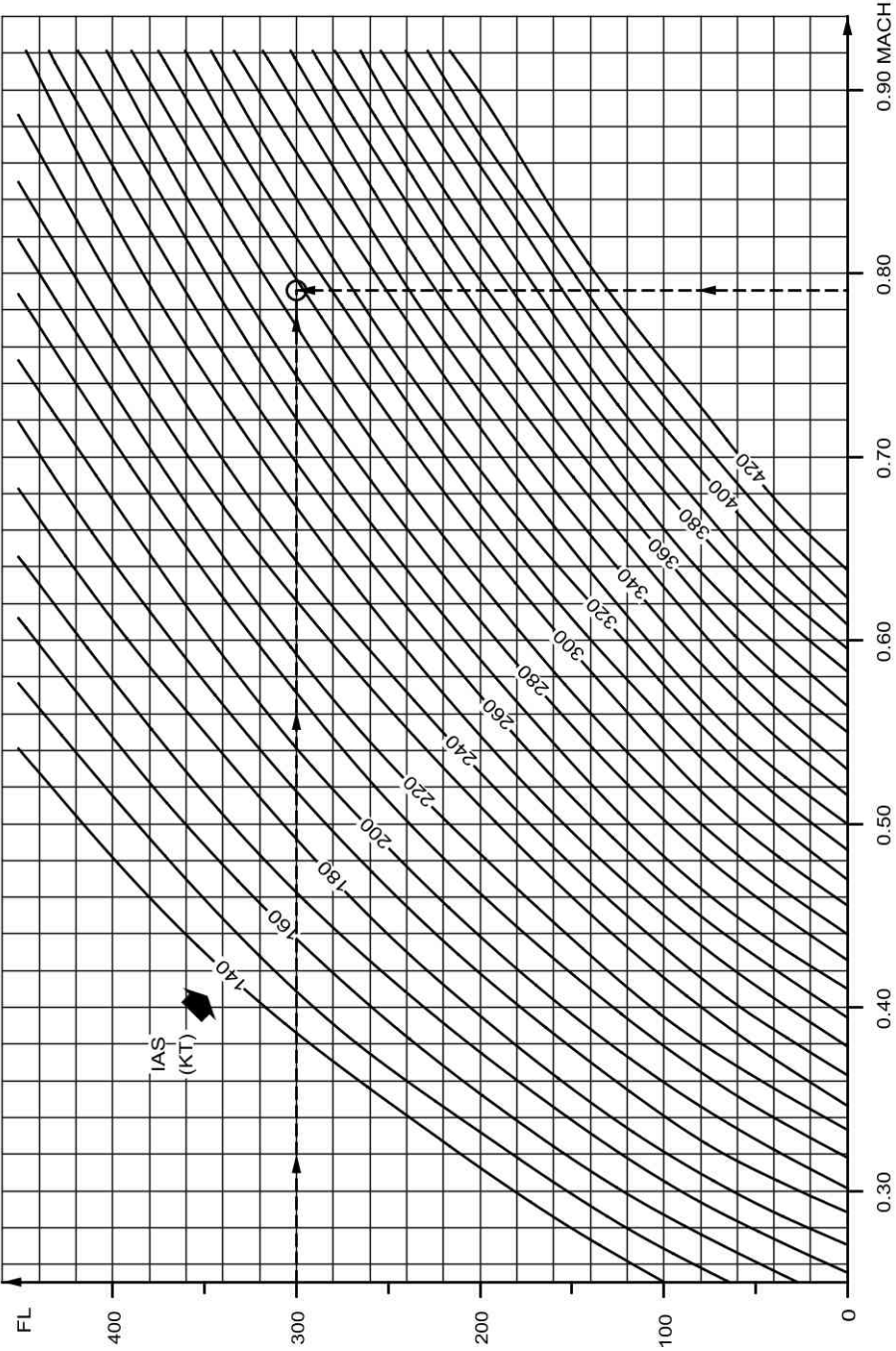
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**







## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: *In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.*

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  
 $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$   
 This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  
 $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$   
 This additional fuel must be added to the fuel predictions provided by the FMS.

Note: *Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:*

- *Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or*
- *If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.*

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

## FUEL PENALTY FACTORS/INOP SYS TABLE

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
<b>F/CTL</b>	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
<b>L/G</b>	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**


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**SEVERE TURBULENCE..... OPS.01**

**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	75.7	76.6	77.7	79.0	-	-	-	-	-
370	0.76	74.7	75.5	76.3	77.2	78.4	79.7	-	-	-
350	0.76	74.3	74.8	75.6	76.3	77.1	78.1	79.3	80.5	-
330	0.76	74.5	74.8	75.3	76.0	76.6	77.4	78.2	79.2	80.2
310	275	74.1	74.3	74.7	75.2	75.8	76.4	77.1	77.9	78.8
290	275	72.9	73.2	73.5	73.9	74.5	75.1	75.8	76.5	77.3
270	275	71.7	71.9	72.3	72.7	73.3	73.9	74.5	75.2	76.0
250	275	70.4	70.7	71.0	71.4	71.9	72.6	73.2	73.9	74.7
200	275	66.8	67.1	67.4	67.9	68.4	69.0	69.8	70.4	71.1
150	250	59.9	60.4	61.0	61.7	62.5	63.5	64.5	65.5	66.5
100	250	56.3	56.7	57.2	57.8	58.5	59.3	60.3	61.4	62.5
50	250	52.7	53.4	53.8	54.4	54.9	55.7	56.5	57.4	58.4

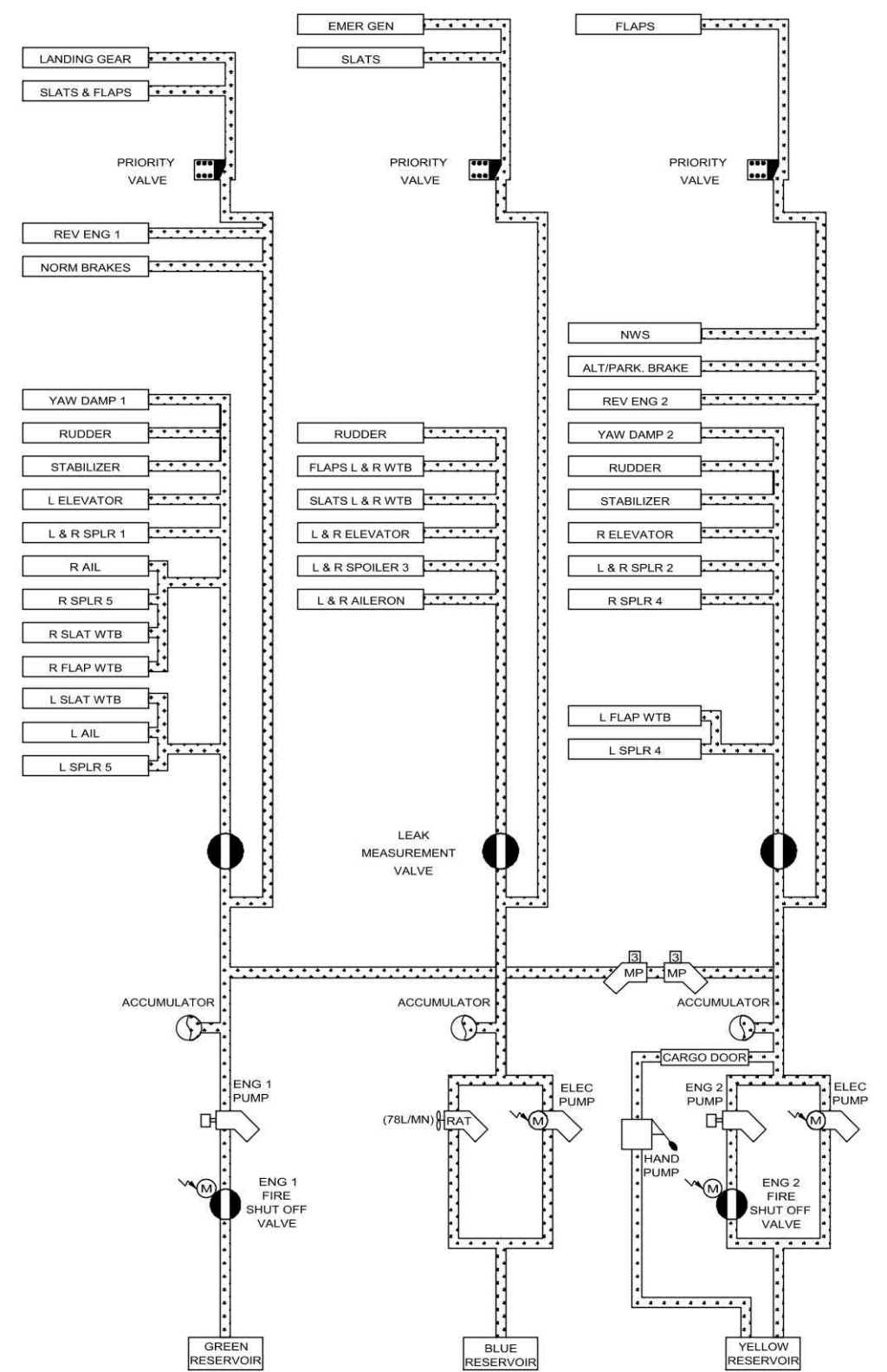
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

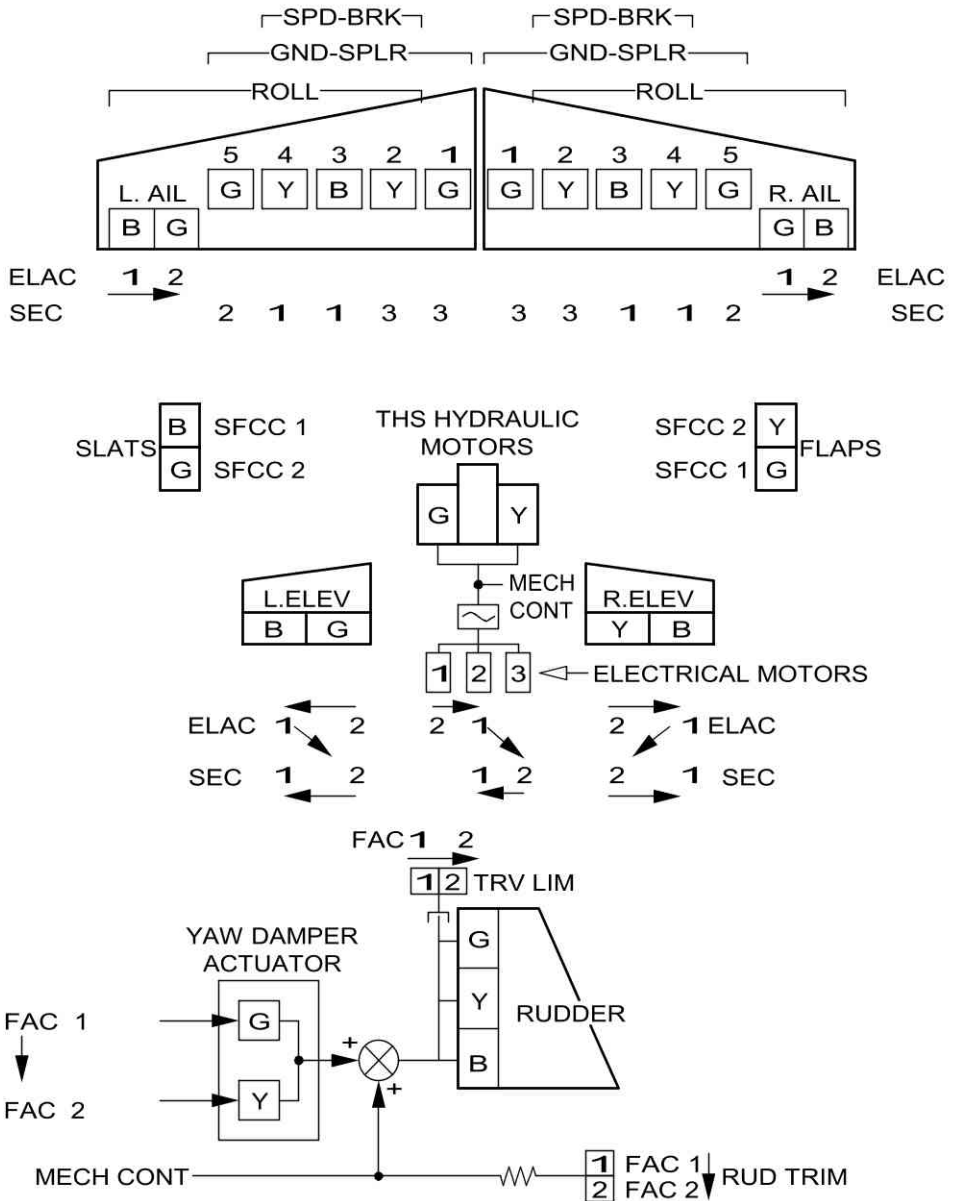
A/THR in managed speed.....USE

**HYDRAULIC ARCHITECTURE**





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.



# **OPERATIONS ENGINEERING BULLETINS**

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**OEBPROC-PLP PRELIMINARY PAGES**

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**OEBPROC-36 No SRS Engagement During Go Around in the Case of  
EPR Mode Fault**

**No SRS Engagement During Go Around in the Case of EPR Mode  
Fault..... 36.00**

**No SRS Engagement During Go Around in the Case of EPR Mode  
Fault..... 36.01**

**OEBPROC-38 Erroneous Radio Altimeter Height Indication**

**Erroneous Radio Altimeter Height Indication..... 38.00**

**Erroneous Radio Altimeter Height Indication..... 38.01**

**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2)  
BLEED FAULT**

**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED  
FAULT..... 40.00**

**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED  
FAULT..... 40.01**

**OEBPROC-41 Erroneous Alternate Fuel Predictions Upon  
Modification of a Company Route in the Alternate Flight Plan**

**Erroneous Alternate Fuel Predictions Upon Modification of a  
Company Route in the Alternate Flight Plan..... 41.00**

**Erroneous Alternate Fuel Predictions Upon Modification of a  
Company Route in the Alternate Flight Plan..... 41.01**

**OEBPROC-43 F/CTL SPOILER FAULT**


**F/CTL SPOILER FAULT..... 43.00**

**F/CTL SPOILER FAULT..... 43.01**

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

**L/G GEAR NOT DOWNLOCKED..... 44.00**

**■ L/G GEAR NOT DOWNLOCKED ■..... 44.01**

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# OEB36 Issue 1.0

## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSR					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HSR					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

RED OEB – RED OEB – RED OEB – RED OEB – RED OEB – RED OEB – RED OEB

M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSR				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSR				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	<b>BLANK</b>
		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSR				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSR				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



<b>AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)</b>
--------------------------------------------------------------------------------

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).





## OEB41 Issue 1.0

# ERRONEOUS ALTERNATE FUEL PREDICTIONS UPON MODIFICATION OF A COMPANY ROUTE IN THE ALTERNATE FLIGHT PLAN

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 204.

This OEB is issued to inform the operators of the following: Erroneous alternate (ALTN) fuel predictions are experienced when the flight crew modifies a company route (CO RTE) previously inserted in the alternate Flight Plan (F-PLN).

This OEB provides an explanation and operational recommendations in case of erroneous ALTN fuel predictions.

**Applicable to:**

Aircraft with Honeywell FMGC Release 1A "H2" (MOD 38778, Airbus SB A320 22-1269 and MOD 38779, Airbus SB A320 22-1270)


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		41.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-41		Erroneous Alternate Fuel Predictions Upon Modification of a Company Route in the Alternate Flight Plan	00013616.0001001	30 MAR 12
Criteria: P10763 Applicable to: B-HSR					
	OEBPROC-41		Erroneous Alternate Fuel Predictions Upon Modification of a Company Route in the Alternate Flight Plan	00013617.0001001	30 MAR 12
Criteria: P10763 Applicable to: B-HSR					



## **ERRONEOUS ALTERNATE FUEL PREDICTIONS UPON MODIFICATION OF A COMPANY ROUTE IN THE ALTERNATE FLIGHT PLAN**

### **ECAM ENTRY**

None

### **PROCEDURE**

This OEB PROC N°41 is issued to provide flight crews with the following recommendations:  
This procedure only applies when a CO RTE is used for ALTN F-PLN. In the case of ALTN fuel predictions erroneously set to zero further to a modification of this ALTN F-PLN:

**ENTER** manually a waypoint in the en-route F-PLN (neither in the departure, nor in the arrival), to start a new computation of ALTN fuel predictions

Maintain or delete the entered waypoint at convenience

Check the ALTN fuel predictions are correct

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		30 MAR 12

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## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSR				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HSR				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF  
*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10  
*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED  
*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above  $V_{FE_{NEXT}}$ , the flight crew should deselect A/THR, decelerate to  $V_{FE_{NEXT}}$ , and select CONF 1 when below  $V_{FE_{NEXT}}$ . When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... $V_{REF} + 10KT$

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers.....x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<div>44.00</div> <div>30 MAR 12</div>
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## OEB44 Issue 2.0

# L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSR				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HSR				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

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		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HTD**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HTD</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HTD</b>				
	OEB30 issue 1.0	W	N	30 MAR 12	No SRS Engagement During Go Around Below MDA
	Criteria: SA <b>Applicable to: B-HTD</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HTD</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HTD</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HTD</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HTD</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12


<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-28	No Localizer or Glide Slope Capture in Approach	30 MAR 12
	OEBPROC-30	No SRS Engagement During Go Around Below MDA	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12


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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HTD</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	0993	HDA 0101	B-HTD	321-231


(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
		30 MAR 12


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	K2113		30 AUG 10	FUSELAGE - REAR FUSELAGE SECTION 16A - DEFINE A321 BASIC STRUCTURE
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	Applicable to: ALL			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	Applicable to: ALL			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	Applicable to: ALL			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	Applicable to: ALL			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	Applicable to: ALL			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	Applicable to: ALL			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	Applicable to: ALL			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	Applicable to: ALL			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	Applicable to: ALL			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	Applicable to: ALL			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	Applicable to: ALL			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+)- STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	Applicable to: ALL			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	Applicable to: ALL			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	Applicable to: ALL			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	Applicable to: ALL			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	Applicable to: ALL			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	Applicable to: ALL			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	Applicable to: ALL			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	Applicable to: ALL			




M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P1872		30 AUG 10	AIR CONDITIONING - INSTALL CIRCUIT BREAKER FOR REAR CARGO COMPT VALVES FOR EROPS -
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	P3341		30 AUG 10	LANDING GEAR - WHEELS AND BRAKES - INSTALLATION OF MESSIER GOODRICH WHEELS AND BRAKES ON A321
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	Applicable to: ALL			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	Applicable to: ALL			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	32-1369 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INTRODUCE BSCU STD 10.1 - SB ONLY.
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0070		30 AUG 10	AIR CONDITIONING - CARGO COMPARTMENT - VENTILATION - INSTALL SYSTEM IN AFT COMPARTMENT -
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	31-1141 04		30 AUG 10	INDICATING/RECORDING SYSTEMS - FWS - INTRODUCE FWC STANDARD H1P-E3P.
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	Applicable to: ALL			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	<b>Applicable to: ALL</b>			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**

DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

# USE OF SUMMARIES

**GENERAL**

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES. These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

**APPROACH PREPARATION**

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

**APPROACH**

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.



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## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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**ELEC EMER CONFIG Summary.....24.02**

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**ABN-26 Fire Protection**

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**■ SMOKE/FUMES/AVNCS SMOKE ■.....26.02**

**ABN-27 Flight Controls**

**LANDING WITH SLATS OR FLAPS JAMMED.....27.01**  
**SIDESTICK/RUDDER PEDALS STIFF.....27.03**  
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**FUEL IMBALANCE..... 28.01**  
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## CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

**CAUTION**

Check that  $\Delta P$  is zero before opening the doors.

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## LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### ■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:

#### ● When the system has recovered:

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### ■ DESCENT (IF TIME PERMITS) :

#### ● When the system has recovered:

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.


Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>				
ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
	AFT CRG ISOL VALVE	Norm	Inop	Inop
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1+ N° 2	N° 1+ N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



Continued from the previous page

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a)

Restored, when speed is below 100 kt.

(b)

Crew oxygen valve inoperative.

(c)

Lost, when speed is below 50 kt.

(d)

Lost 30 s after last engine shutdown.

(e)


IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f)

For APU start only.

(g)

Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK USABLE BY GRAVITY (2T UNUSABLE) <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
<b>VREF = VLS CONF FULL</b>	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV										
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94
DRY runway	2 260	2 340	2 450	2 560	2 670	2 810	2 970	3 550	3 800	4 050
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.20									
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.95									
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind				
DRY Runway	+3 %					+16 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
 In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT.....

ON
- If fuel vapors:**

CAB FANS.....

ON

PACK 1+2.....

OFF
- If no fuel vapors:**

CAB FANS.....

OFF

ECON FLOW.....

OFF
- LDG ELEV.....

10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude).....

INITIATE
- ATC.....

NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC.....

CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*
- At FL 100 or MEA**

APU MASTER SW (if in ELEC EMER CONF).....

ON

PACK 1+2.....

OFF

MODE SEL.....

MAN

MAN V/S CTL.....

FULL UP

RAM AIR.....

ON

APU MASTER SW.....

OFF
- If smoke persists, open CKPT window:**

MAX SPEED.....

200 KT

COCKPIT DOOR.....

OPEN

HEADSETS.....

ON

PNF COCKPIT WINDOW.....

OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALLEY..... OFF

SIGNS..... ON

CKPT/CABIN COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMER
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT..... ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATED:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100 or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ELEC EMER CONFIG..... CONSIDER  
*Refer to the end of the procedure to set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING..... CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

- **IF AIR COND SMOKE SUSPECTED:**  
 APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 CARGO AFT ISOL VALVE..... OFF  
 PACK 1..... OFF  
 ● **If smoke continues:**  
 PACK 1..... ON  
 PACK 2..... OFF  
 ● **If smoke still continues:**  
 PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ● **IF CAB EQUIPMENT SMOKE SUSPECTED:**  
 ● **If smoke continues:**  
 EMER EXIT LIGHT..... ON  
 BUS TIE..... OFF  
 GEN 2..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE  
 ● **If smoke still continues or if faulty  
equipment confirmed isolated:**  
 GEN 2..... ON  
 BUS TIE..... AUTO



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

- If faulty equipment not confirmed isolated,  
before L/G extension:  
 GEN 2..... ON  
 BUS TIE.....AUTO  
 SMOKE/FUMES REMOVAL..... CONSIDER

**UNDETERMINED/AVNCS/ELECTRICAL SMOKE**

- IF SMOKE SOURCE CAN NOT BE  
DETERMINED AND STILL CONTINUES OR  
AVNCS/ELECTRICAL SMOKE SUSPECTED:  
 ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
 NORMAL VENTILATION..... RESTORE

**TO SET ELEC EMER CONFIG**

- EMER ELEC GEN 1 LINE.....OFF  
 EMER ELEC PWR..... MAN ON
- WHEN EMER GEN AVAIL:  
 APU GEN.....OFF  
 GEN 2..... OFF

ELEC EMER CONFIG  
 APPLY ECAM PROCEDURE, BUT DO NOT RESET  
 GEN, EVEN IF REQUESTED BY ECAM.

- AT 3 min OR 2 000 ft AAL BEFORE LANDING:  
 GEN 2..... ON  
 EMER ELEC GEN 1 LINE.....ON
- WHEN A/C IS STOPPED:  
 ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


- Note:
- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
  - In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED

Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	215 kt	195 kt	190 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	215 kt		215 kt	195 kt	190 kt	
S > 3	190 kt		190 kt	190 kt	190 kt	

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM

CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

● **IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

● **IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP

FUEL IMBALANCE

FOB..... CHECK  
 Compare the FOB + FU, with the FOB at departure.  
 If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. Refer to ABN-28 FUEL LEAK.
----------------	------------------------------------------------------------------------------------------------------------------------------------

FUEL X FEED..... ON  
 CTR TK L+R XFR..... OFF

- On the lighter side:  
 FUEL PUMPS.....OFF  
  
 ● When fuel is balanced:  
 FUEL PUMPS..... ON  
 CTR TK L+R XFR..... ON  
 FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- A tank is overflowing (due to pipe rupture in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each wing tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK L+R XFR..... OFF

*Each engine is fed via its associated wing tank only.*

WING TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each wing tank.*

#### ■ CASE 1 : IF ONE WING TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the wing tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

CTR TK L+R XFR..... ON  
 FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The wing tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.





FUEL LEAK (Cont'd)

ENGINE RESTART..... CONSIDER  
CTR TK XFR (non-leaking side)..... ON

CAUTION	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
---------	----------------------------------------------------------------------------------------------------------------------

■ CASE 2 : IF BOTH WING TANKS DEplete AT A SIMILAR RATE:

A leak from the Center tank or the APU feeding line may be suspected.

● If fuel smell in the cabin:

APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*

● When fuel quantity in one wing tank is less than 3 t (6 600 lb ):

CTR TK L+R XFR..... ON

FOR LANDING

CAUTION	Do not use reversers.
---------	-----------------------

GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/.77  
 MANEUVER WITH CARE  
 Flight controls remain in normal law.

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR

W (1 000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW/FLAPS SLOW  
 GPWS LDG FLAP 3..... ON  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE** Only one ELEV and two spoilers per wing  
**SPOILERS** Only 2 per wing  
**REVERSER** Only N°1  
**BRAKING** NORMAL  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>										
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94
<b>DRY runway</b>	1 400	1 450	1 520	1 590	1 650	1 740	1 840	2 200	2 350	2 500
<b>WET runway</b>	1 880	1 980	2 090	2 220	2 330	2 450	2 580	2 780	2 960	3 100
<b>CONTA runway</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75									

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 16 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
DRY runway	1 520	1 580	1 650	1 730	1 800	1 890	2 000	2 390	2 560	2 720	
WET runway	2 030	2 150	2 270	2 400	2 520	2 660	2 790	3 010	3 200	3 360	
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.80										

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 16 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/0.77  
 MANEUVER WITH CARE  
 ALTN LAW : PROT LOST

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 30 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW / FLAPS JAMMED  
 GPWS FLAP MODE..... OFF  
 ● **For Flaps extension:**  
 SPD SEL..... VFE NEXT - 5KT  
 When in landing CONF : DECELERATE TO CALCULATED VAPP  
 Stabilize at VAPP before L/G down, to be trimmed for approach.  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE:** PITCH AUTHORITY REDUCED (No stabilizer).  
 MAN TRIM Unusable  
 Only 1 spoiler per wing – Direct law  
**SPOILERS:** Only 1 per wing  
**NO REVERSER**  
**BRAKING:** BRK Y ACCU PR ONLY (7 applications)  
 MAX BRK PR 1 000 PSI  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption  
 ● **For circuit:**  
 MAINTAIN SLATS/FLAPS CONFIGURATION  
 Recommended speed: MAX SPD - 10 kt  
 ● **For diversion:**  
 ● **If Flaps at zero:**  
 SELECT CLEAN CONFIGURATION  
 Normal operating speeds  
 ● **If Flaps not at zero:**  
 MAINTAIN SLATS/FLAPS CONFIG  
 Recommended speed: MAX SPD - 10 kt

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
<b>DRY runway</b>	2 050	2 130	2 230	2 330	2 430	2 550	2 700	3 230	3 450	3 680	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.05										
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.00										
<b>CORRECTIONS</b>	+ 1 000 ft above SL					+ 10 kt tailwind					
<b>DRY runway</b>	+ 3 %					+ 16 %					

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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**DOUBLE AOA HEAT FAILURE**

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

## LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <b>L/G GEAR NOT DOWN</b> ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**



DOMELT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.





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<b>LDG WITH ABNORMAL L/G (Cont'd)</b>		
REVERSE..... DO NOT USE		
<b>● If NOSE L/G abnormal:</b> NOSE..... MAINTAIN UP <i>After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.</i> BRAKES (compatible with elevator efficiency)..... APPLY ENG MASTERS..... OFF <i>Shutdown the engines before nose impact.</i>		
<b>● If one MAIN L/G abnormal:</b> ENG MASTERS..... OFF <i>At touchdown, shut down both engines.</i> FAILURE SIDE WING..... MAINTAIN UP <i>Use roll control, as necessary, to maintain the unsupported wing up as long as possible.</i> DIRECTIONAL CONTROL..... MAINTAIN <i>Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.</i>		
<b>● If both MAIN L/G abnormal:</b> ENG MASTERS..... OFF <i>Shut down the engines in the flare, before touchdown.</i> PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°		
<b>WHEN A/C STOPPED</b>		
ENG (all) and APU FIRE pushbutton..... PUSH <i>Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.</i>		
ENG (all) and APU AGENT..... DISCH		
<b>■ If Evacuation required:</b> EVACUATION..... INITIATE - All emergency and passenger doors may be used to evacuate the aircraft. - Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton  .		
<b>■ If Evacuation not required:</b> CABIN CREW and PASSENGERS (PA)..... NOTIFY <i>Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).</i>		

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW

### (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

..... PULL AND TURN


L/G LEVER..... DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT



ADR 1 + 2 + 3 FAULT (Cont'd)


● DURING FINAL APPR

V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*

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## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

- The following procedure is not displayed on the ECAM:
- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.
  - **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.
    - **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
    - **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
- **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.

During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
 ALIGN light on during 30 s.  
 ATT MODE displayed on CDU.
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

- If “H” is written on the “5” key:  
 H KEY..... PRESS  
 Degree marker, 0 decimal point, ENT and CLR lights come on.  
 A/C HEADING..... ENTER
- If “H” is not written on the “5” key:  
 A/C HEADING..... ENTER  
 Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.  
 Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.  
 Heading will be displayed on the associated ND.  
 “HDG-ATT MODE” will be displayed on CDU.

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.





## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and  $V_{MAX}$ .*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note:* Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 81 t	81 t-68 t	Below 68 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	4.0/70.7	4.0/66.4	4.0/61.5
2	F	7.0/68.9	7.0/64.6	7.0/59.9
1 + F	S	3.5/67.6	3.0/63.8	3.0/58.6
1	S	7.5/65.5	7.5/61.4	7.5/56.5
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200 -FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

#### ■ If at least one ADR is reliable:

Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

#### ■ If affected ADR(s) cannot be identified or all ADRs are affected:

ONE ADR..... KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF..... USE FLAP 3

APP SPD..... VLS +10

LDG DIST PROC..... APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

#### ■ To return to departure airport:

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

#### ■ To accelerate and clean up after takeoff:

Accelerate and clean up the aircraft in level flight:

THRUST..... CLB

FLAPS..... RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### **CLIMB**

Set the thrust to CL.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	270 kt	8.5/CLB	9.0/CLB	10.0/CLB
FL 50 - FL 100		8.0/CLB	8.0/CLB	9.0/CLB
FL 100 - FL 150		7.0/CLB	7.0/CLB	8.0/CLB
FL 150 - FL 200		6.0/CLB	6.0/CLB	6.5/CLB
FL 200 - FL 250	300 kt	4.0/CLB	4.0/CLB	4.0/CLB
FL 250 - FL 280		3.5/CLB	3.0/CLB	3.0/CLB
Above FL 280	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### **CRUISE**

Adjust N1 to maintain approximate level flight with pitch attitude held constant.

When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200-FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

### **DESCENT**

Set the thrust to IDLE.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 280	M 0.76	-1.0/IDLE	-1.5/IDLE	-2.0/IDLE
FL 280-FL 200	300 kt	-0.5/IDLE	-1.5/IDLE	-2.5/IDLE
FL 200 - FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-1.5/IDLE
Below FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-2.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.0/IDLE	2.0/IDLE

### **INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT**

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.0/63.4	5.0/59.4	5.0/54.6
1	S	7.5/65.6	7.5/61.4	7.5/56.6
1+F <sup>(1)</sup>	S	3.5/67.6	3.0/63.8	3.0/58.6
2	F	7.0/68.5	7.0/64.7	7.0/59.9



UNRELIABLE SPEED INDICATION/ADR  
CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	4.0/74.8	4.0/71.0	4.0/65.8

(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.

FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	2.0/60.0	2.0/56.0	1.5/51.6

FLYING TECHNIQUE TO STABILIZE SPEED:

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target.  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

##### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

##### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :  
 X BLEED..... CHECK OPEN  
 DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
 APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
 WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
 APU BLEED..... ON  
 MAX FL200  
 AVOID ICING CONDITIONS
  - IF ICE ACCRETION  
 APPR SPD.....VLS + 10 KT  
 LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*



ENG DUAL FAILURE - FUEL REMAINING


Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :  
**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THR LEVERS..... IDLE  
FAC 1.....OFF THEN ON  
ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.  
OPTIMUM RELIGHT SPD.....280 KT

*Note:* In the case of an “ENG DUAL FAILURE” during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.  
In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:

WEIGHT	Pitch (°)
At or below 60 000 kg/132 000 lb	-2.5
70 000 kg/154 000 lb	-1.5
80 000 kg/176 000 lb	-0.5

At 280 kt, the aircraft can fly up to about 2.4 nm per 1 000 ft (with no wind).  
LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*  
VHF1/HF1  /ATC1.....USE  
ATC.....NOTIFY

- **IF NO RELIGHT AFTER 30 SEC:**  
ENG MASTERS..... OFF 30 S/ON  
*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*
- **IF UNSUCCESSFUL:**  
CREW OXY MASKS (Above FL 100).....ON
  - **WHEN BELOW FL 250**  
APU (IF AVAIL)..... START
  - **WHEN BELOW FL 200**  
WING ANTI ICE..... OFF  
APU BLEED..... ON  
ENG MASTERS (one at a time)..... OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
94	251	261	271
92	248	258	268
88	242	252	262
86	239	249	259
84	236	246	256
82	233	243	253
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 700 ft/min.

CABIN AND COCKPIT..... PREPARE  
CABIN SIGNS..... ON  
GALLEY..... OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR..... ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 and L/G DOWN) will be approximately 1.1 nm per 1 000 ft (with no wind).

BARO..... SET  
CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG..... USE FLAP 3  
Only slats extend, and slowly.  
MIN APPR SPEED..... 160 KT



## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE

*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**

- **When in CONF 3 and VAPP:**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN

*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*

- **When L/G downlocked**

L/G lever..... DOWN

APPROACH SPEED..... ADJUST

*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*

GND SPLR..... ARM

MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**

PARKING BRK..... ON

ATC..... NOTIFY

FIRE pushbutton (ENG and APU)..... PUSH

AGENTS (ENG and APU)..... DISCH

*Engine Agent 2 is not available.*

- **If Evacuation required:**

EVACUATION..... INITIATE

ELT  ..... CHECK EMITTING

*If not, switch on the transmitter.*

- **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.*  
*If that causes a strong crosswind, ditch into the wind.*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING

ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*

**ENG DUAL FAILURE - NO FUEL REMAINING**

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON THRUST LEVERS..... IDLE FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....240 KT/GREEN DOT


*Initially, fly 240 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 700 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE ATC..... NOTIFY CREW OXY MASKS (Above FL 100).....ON CABIN AND COCKPIT..... PREPARE SIGNS.....ON GALLEY..... OFF

USE RUDDER WITH CARE

● **WHEN BELOW FL 150**

RAM AIR..... ON

**COMMON ACTIONS FOR THE APPROACH**

**APPROACH PREPARATION**

*Note: Final descent slope, when configured (CONF 3; L/G DOWN), will be approximately 1.1 N/m per 1 000 ft (with no wind).*

BARO..... SET

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt.*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)
  - When in CONF 3 and VAPP  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - When L/G downlocked  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*  
  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

AT 2 000 FT AGL

CABIN.....NOTIFY FOR LANDING


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

AFTER LANDING

- When the aircraft has stopped :  
PARKING BRK.....ON  
ATC.....NOTIFY
  - If Evacuation required :  
EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - If Evacuation not required :  
CABIN CREW and PASSENGERS (PA).....NOTIFY



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell*  
*If that causes a strong crosswind, ditch into the wind..*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF

AFTER DITCHING

ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

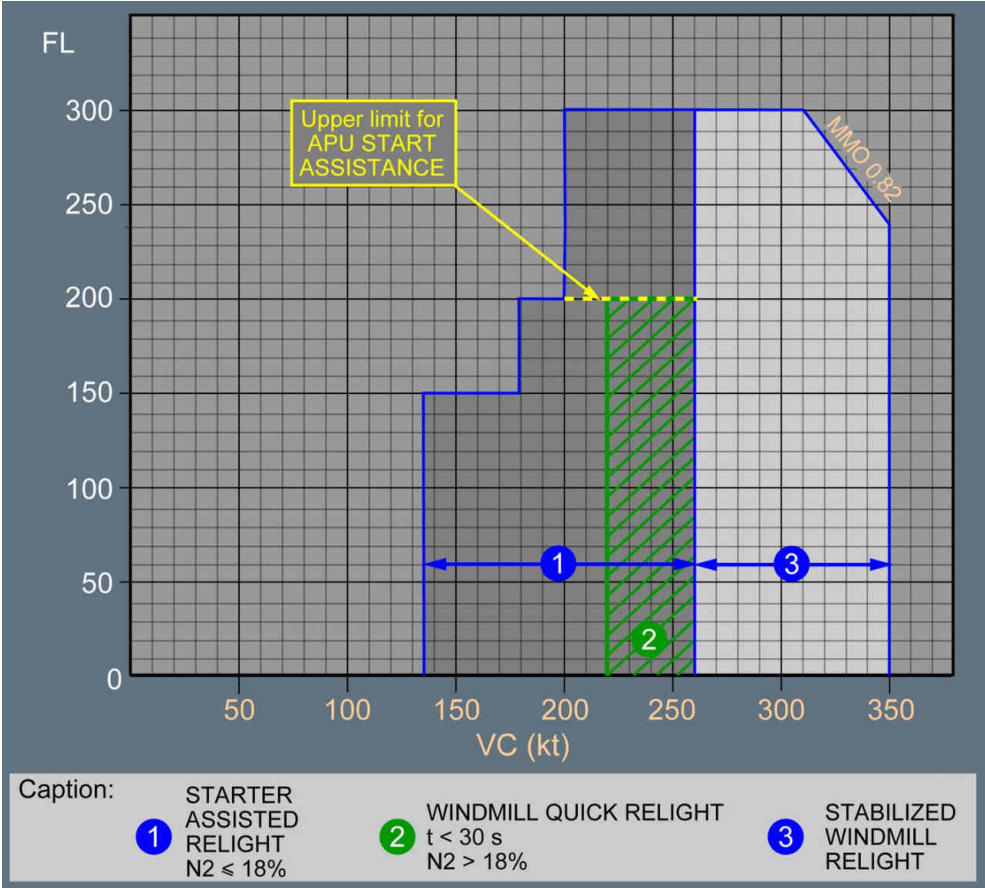
# ENG RELIGHT (IN FLIGHT)

- MAX ALTITUDE.....See below
- ENG MASTER (affected).....OFF
- THR LEVER (affected)..... IDLE
- ENG MODE SEL..... IGN
- X BLEED ..... OPEN
- WING A. ICE (for starter assist).....OFF
- ENG MASTER (affected)..... ON

Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.  
 Engine light up should be achieved within 30 s after fuel flow increases.

- **When idle is reached (AVAIL indication pulses in green) :**  
 ENG MODE SEL..... NORM  
 TCAS MODE SEL <img alt="TCAS selector symbol"/> ..... check TA/RA  
 Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.  
 Affected SYS..... RESTORE

- **If no relight :**  
 ENG MASTER (affected)..... OFF  
 Wait 30 s before attempting a new start (to drain the engine).







## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
---------	---------------------------------------------------------------------------------------------------------------------------------------------

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

- When burning has stopped :  
MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1  $\geq$  5 units, N2  $\geq$  5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	76	74	71	68	64	61	58	54
5	76	74	71	68	64	61	56	52
10	76	74	71	68	64	59	54	
15	76	74	71	67	61	57	52	
20	76	74	69	64	59	54		
25	76	71	66	61	56			
30	73	68	64	59	54			
35	69	65	61	57	52			
40	66	62	59	55				
45	63	60	57					
50	60	57						
55	57							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### **COCKPIT PROCEDURES**

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

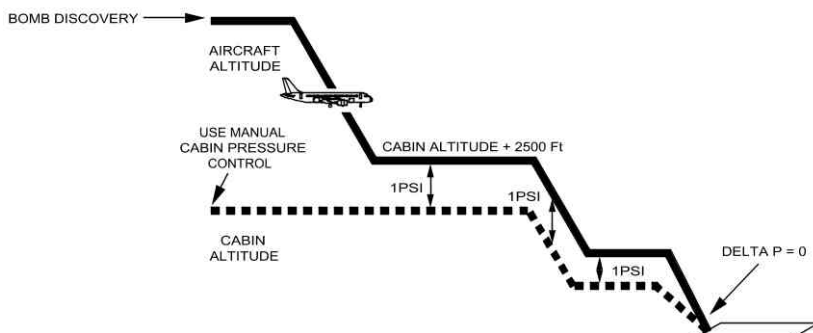
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE
<i>Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.</i>	
NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN
<i>Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.</i>	
DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



## BOMB ON BOARD (Cont'd)

- **When at CAB ALT+2 500 ft:**
  - 1 PSI DELTA P..... MAINTAIN
  - GALLEY..... OFF
  - FLAPS (fuel permitting)..... AT LEAST CONF 1
  - For landing, use normal configuration.*
  - LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**
  - 1 PSI DELTA P..... MAINTAIN
- **During approach:**
  - CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**
    - EVACUATION..... INITIATE
    - Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**
    - CABIN CREW and PASSENGERS (PA)..... NOTIFY

### **CABIN PROCEDURES**

If a suspect device is found in the cabin:

<b>WARNING</b>	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
<b>WARNING</b>	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
<b>CAUTION</b>	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

**EOD PERSONNEL ON BOARD..... CHECK**

*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

**BOMB..... DO NOT OPEN**

**BOMB..... DO NOT CUT WIRES**

**BOMB..... SECURE AGAINST SLIPPING**

**BOMB..... AVOID SHOCKS**

*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

**PASSENGERS..... LEAD AWAY FROM BOMB**

*Move passengers at least 4 seat rows away from the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*

*Seat backs and tray tables must be in their full upright position.*

*Service items may need to be collected in order to secure tray tables.*

**PORTABLE ELECTRONIC DEVICES..... SWITCH OFF**

*The cabin crews must command passengers to switch off all portable electronic devices.*



## BOMB ON BOARD (Cont'd)

### BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

### EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

### GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

#### ● If the bomb can be moved:

#### RH AFT CABIN DOOR SLIDE.....DISARM

#### LEAST RISK BOMB LOCATION (LRBL).....PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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### BOMB INDICATION LINE.....POSITION

Note: *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

### BOMB.....MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

<b>CAUTION</b>	<i>Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.</i>
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### LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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*Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.*







## BOMB ON BOARD (Cont'd)

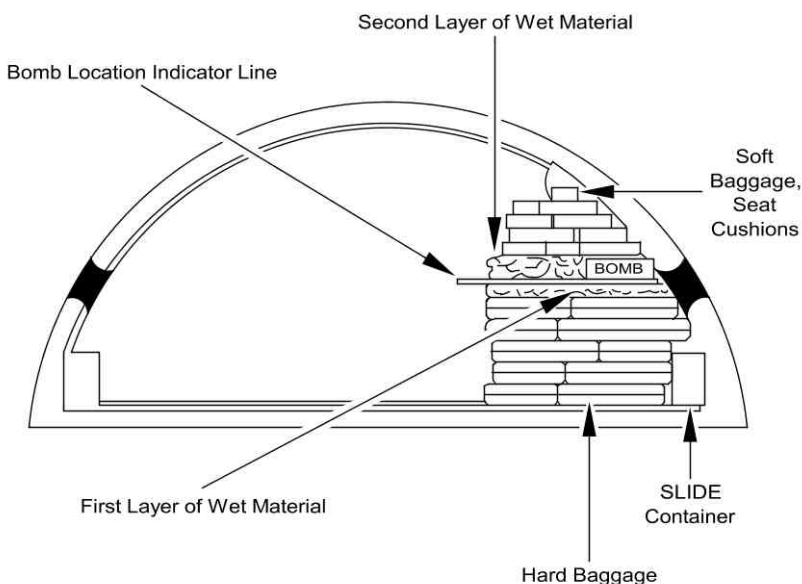
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



### **PASSENGERS.....MOVE/ADVISE**

*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

### **CABIN CREW..... NOTIFY COCKPIT CREW**

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*

### **EVACUATION/DISEMBARKATION.....EXECUTE**

*Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".*

*Use all available airport facilities to disembark without delay.*

## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALLEY.....OFF

LDG ELEV..... SELECT 00

BARO..... SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU)..... DISCH

EVACUATION..... INITIATE



## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### PREPARATION

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALLEY.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### APPROACH

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### AT 2 000 FT AGL

CABIN.....NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT.....ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

#### ● When aircraft has stopped:

PARKING BRK.....ON

ATC (VHF 1).....NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ If Evacuation required:

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)		
<div>■ If Evacuation not required: CABIN CREW and PASSENGERS (PA)..... NOTIFY</div>		



## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS..... ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*

### WHEN DESCENT ESTABLISHED


EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

#### **CAUTION**

*Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: *The recommendation is to descend with the autopilot engaged.  
Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: At very high weights, VFE CONF1 is close to VLS clean. To select CONF1, deselect A/THR, decelerate to (or slightly below) VLS and select CONF1 when below VFE. When established at CONF1, the crew can re-engage the A/THR and use managed speed again

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.  
Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown

REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	92	88	82	76	70	65	60	55
15	92	88	82	76	70	65	60	55
20	92	88	82	76	70	65	60	55
25	92	87	80	75	69	64	59	
30	92	85	79	73	68			
35	88	82	76	70	65			
40	85	79	73	68				
45	82	75	70					
50	78	72						
55								



## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note: In case of lack of pitch down authority, reducing thrust may be necessary.

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.

**TAILSTRIKE**

In the event of a tailstrike, apply the following procedure:

**LAND ASAP**

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF





## VOLCANIC ASH ENCOUNTER

● **If the aircraft enters a volcanic ash cloud:**

180 ° TURN..... INITIATE  
ATC..... NOTIFY  
A/THR..... OFF  
THRUST (conditions permitting).....REDUCE  
CREW OXYGEN MASKS.....ON/100 %/EMER  
CABIN CREW.....NOTIFY  
PASSENGER OXYGEN.....AS RQRD  
ENG ANTI ICE..... ON  
WING ANTI ICE..... ON  
ECON FLOW.....OFF

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

APU..... START  
ENGINE PARAMETERS..... MONITOR  
AIRSPEED INDICATIONS.....MONITOR

If airspeed is unreliable or lost, Refer to the QRH ABN 34 Unreliable Speed Indication / ADR Check Proc procedure.

Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.

In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.

To manually depressurize the cabin:

CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... FULL UP

Due to the increased noise level, pay particular attention to visual warnings.

## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

Note: When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● **Before takeoff**

Delay takeoff, or select the most favorable runway.

##### ● **During the takeoff run**

Reject takeoff.

Note: Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● **When airborne**

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha_{prot}$ .
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha_{prot}$ .
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ **Before TAKEOFF**

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.


#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.



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<b>WINDSHEAR (Cont'd)</b>		
<p> <b>■ Airborne, initial climb or landing</b>            THR LEVERS AT TOGA.....SET OR CONFIRM            AP (if engaged).....KEEP            SRS ORDERS..... FOLLOW  <i>This includes the use of full backstick, if demanded.</i>   <u>Note:</u>    1. If engaged, the autopilot disengages when <math>\alpha</math> is greater than <math>\alpha</math> prot.                          2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.   <b>DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.</b>   <b>CLOSELY MONITOR FLIGHT PATH AND SPEED.</b>   <b>RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.</b> </p>		

WINDSHIELD/WINDOW ARCING

Affected WINDOW/WINDSHIELD ANTI ICE C/B..... PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)

WINDSHIELD/WINDOW CRACKED

DIAGNOSIS OF INNER PLY.....PERFORM  
*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation  
*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL..... 230/MEA  
*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain ΔP 5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

*Note:*     The following procedure allows maintaining ΔP 5 PSI in manual cabin pressure mode.

CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

ΔP = 5 PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000


● **When starting the descent for approach:**

CAB PRESS MODE SEL..... AUTO

*Note:*     If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:

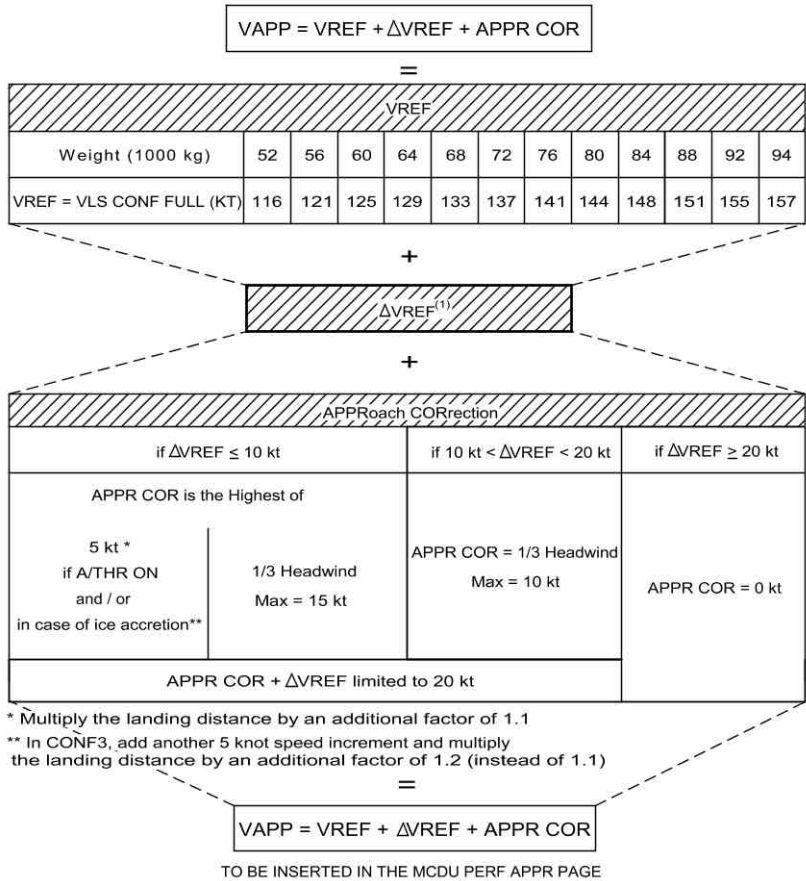
CAB PRESS MODE SEL..... MAN  
 MAN V/S CTL.....FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>				
<b>SYSTEM</b>	<b>CONDITIONS</b>	<b>RECOMMENDED ACTION</b>		
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)		
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control		
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control		
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.		
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>		
	Fuel temp greater than 45 °C in wing tank	GALLEY (OFF)		
	Fuel temp lower than -40 °C in wing tank	Consider descending to a lower altitude, and/or increasing Mach to increase TAT.		
APU	EGT > EGT MAX -33 °C (inhibited during APU start)			
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.		
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"><li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li><li>- If oil pressure is below 60 PSI (red indication), without the <b>ENG</b> OIL LO PR warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li></ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.		
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.		
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <i>Note: If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended: 1. <i>Low Speed-</i> Increase engine speed to increase fuel flow, and thereby cool IDG oil. 2. <i>High Speed-</i> Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.		
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.		
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.		
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).		

# VAPP CALCULATION

## VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



(1) Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables

### EXAMPLE OF VAPP CALCULATION:

Failure : ALTN LAW  
 Flight Conditions : Autothrust ON, ice accretion  
 Landing Configuration : CONF 3  
 Headwind : 12 kt  
 Landing Weight/CG : 60 t  
 VREF determined from the landing weight : 125 kt  
 VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:  
 - 5+5 = 10 kt (ice accretion and landing in CONF 3)  
 - 1/3 Headwind = 12 kt/3 = 4 kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2  
 $VAPP = VREF + \Delta VREF + APPR\ CORR = 125 + 10 + 10 = 145$  kt



<b>USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES</b>
---------------------------------------------------------

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors “WITHOUT REV”** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors “WITH REV”** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:     *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing(i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways /A/THR ON / No wind / WITHOUT REV. / Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.60
	3	6			1.75
RESULT	3	10			1.40x1.75x1.1=2.70

VREF = 131 kt. Therefore  $VAPP = 131 + 10 + 5 = 146$  kt..

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FAILURES	Flaps Lever Position for Landing	$\Delta$ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S $\geq$ 1)	3	30			1.95*
RESULT	3	30			1.95


VREF = 140 kt. Therefore VAPP = 140+30 = 170 kt.



**LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY**

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.50	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.75 2.75	2.75 2.75
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.80 2.00	N/A N/A
	EMER ELEC CONF	3	10	2.75	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	30	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.25*
	S>3	3	5	1.25*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.55	1.45 1.55
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.35 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.65	1.35 1.50
	SEC 1+2+3 FAULT	3	10	1.65	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.25*



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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.45	1.30 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	GREEN + BLUE	3	25	1.85	1.75
	GREEN + YELLOW	3	30	2.50	N/A
	BLUE + YELLOW	3	10	1.70	1.65
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.60 1.75	1.50 1.60
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.30 1.45
	IR 1+2+3 FAULT	3	10	2.45	2.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.25*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.30*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.



**LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY**

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.35	1.15 1.25
	DC EMER CONF	FULL 3	- 6	2.20 2.20	2.20 2.20
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	N/A N/A
	EMER ELEC CONF	3	10	2.20	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.85*
	FLAPS<1				
	S<1	3	45	2.00*	1.75*
	S≥1	3	30	1.70*	1.50*
	1≤FLAPS<2				
	S<1	3	30	1.70*	1.50*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.55*	1.40*
	1≤S≤3	3	10	1.30*	1.20*
	S>3	3	5	1.20*	1.10*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.25*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.40 1.55	1.25 1.35
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.15 1.30
	GREEN + BLUE	3	25	1.95	1.80
	GREEN + YELLOW	3	30	2.05	N/A
	BLUE + YELLOW	3	10	1.80	1.70
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL	10	1.25	1.15
	if there is ice accretion	3	16	1.35	1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.20
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
NAV	IR 1+2+3 FAULT	3	10	1.75	1.75
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.35*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.30*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1	55 (APPR)	1.85*	1.75*
		3	40 (THRESHOLD)	1.30*	1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL	10	1.25	1.15
		3	16	1.35	1.25


- <sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- <sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- <sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- <sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.
- <sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)



**LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY**

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.15 1.25
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.90 1.95
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	N/A N/A
	EMER ELEC CONF	3	10	1.95	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.75*
	FLAPS < 1				
	S<1	3	45	2.00*	1.65*
	S≥1	3	30	1.70*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.60*	1.35*
	S≥1	3	15	1.40*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.50*	1.30*
	S≥1	3	10	1.30*	1.10*
	FLAPS=3				
	S<1	3	25	1.45*	1.25*
	1≤S≤3	3	10	1.25*	1.05*
	S>3	3	5	1.15*	1.00*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.10*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.30 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.25
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.15
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.25*	1.05*



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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.10 1.20
	GREEN+BLUE	3	25	1.80	1.65
	GREEN + YELLOW	3	30	2.00	N/A
	BLUE + YELLOW	3	10	1.75	1.55
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	IR 1+2+3 FAULT	3	10	1.35	1.35
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.30*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.25*	1.05*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.25*	1.70* 1.15*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.




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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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### COMPUTER RESET

When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor.

The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.



<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
22	AUTO FLT FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G01 on 49VU, M06 on 121VU. G02 on 49VU, M07 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: M06, M07, G01, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:</li> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M07 on 121VU.</li> <li>• IF UNSUCCESSFUL:</li> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M06 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M07, G02</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP* in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL:</li> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul>
26	SMOKE DET FAULT	SDCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<div><b>On ground, or in flight</b><ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul></div> <div><div><b>CAUTION</b></div><div>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</div></div> <div><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</div>
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<div><b>WARNING</b></div> <div>Do not reset more than one computer at a time.</div> <div><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</div>
	ELAC or SEC malfunction	ELAC or SEC	<div><b>WARNING</b></div> <div><div>Do not reset more than one computer at a time.<ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul></div><div><b>Note:</b><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></div></div>
28	Loss of fuel quantity indication	FQIC	<div><b>On ground, or in flight:</b><ul style="list-style-type: none"><li>- Pull the C/B of the affected channel:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the C/B.</li></ul></div> <div><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</div>
31	FWS FWC 1(2) FAULT	FWC	<div><b>On ground:</b> Pull, then push, the C/B of the affected FWC:<ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul>Wait 50 s after pushing the C/Bs.</div> <div><b>In flight:</b> Pull, then push, the C/B of the affected FWC:<ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul></div>





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><b>Note:</b> After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><b>Note:</b> After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><b>Note:</b> After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1: <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2: <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>
34	<u>NAV</u> TCAS FAULT	TCAS	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
46	ATSU Malfunction	ATSU	<p>An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.</p> <p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li><li>- Wait 5 s, then:</li><li>- Push the C/Bs in the following order: L15, L16.</li></ul>



# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits:
  - AUTOLAND (HWC30 / TWC10 / XWC20)
  - MANUAL LAND (HWC40 / TWC10 / XWC25)
  - OEI ROLLOUT (IDLE REV ONLY XWC15)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
 Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

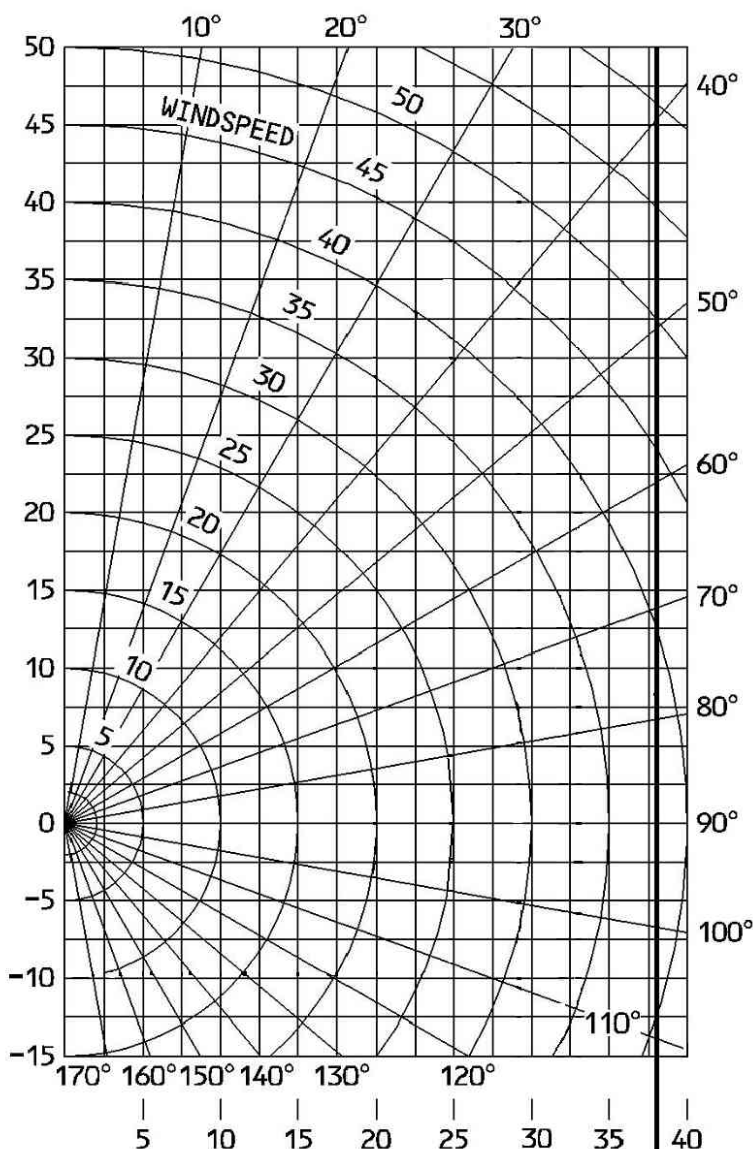
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## WIND COMPONENT CHART - A321



### Weather LIMITS:

SO 1000' / 3000m 10 knots x-wind

JFO 500' / 2000m 15 knots x-wind

FO ≥ CAT I 20 knots x-wind

CAT II Autoland  
30 knots headwind  
20 knots x-wind  
10 knots tailwind  
15 knot x-wind limit  
for OEI Rollout with  
IDLE reverse only.

CAT II No Autoland  
40 knots headwind  
25 knots x-wind  
10 knots tailwind

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## ACARS LANDING FAIL CODE - A321

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02	
			S ≥ 1	03	NAV	IR 1+2+3 FAULT		01
	1 ≤ FLAPS < 2	S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02		
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	03	
	2 ≤ FLAPS < 3	S < 1	06	BLEED			DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion	
			S ≥ 1		07			
	FLAP = 3	S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	09			REV UNLOCK with buffet (CONF 3)		02
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
		FLAP > 3	S < 1	11				
			1 ≤ S ≤ 3	12				
			S > 3	13				
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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**IN FLIGHT PERFORMANCE**

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**SPEEDS**

OPERATING SPEEDS (KT)					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
52	130	168	188	121	116
56	135	174	194	125	121
60	140	180	200	130	125
64	144	186	206	134	129
68	149	192	212	138	133
72	153	197	218	142	137
76	157	203	224	146	141
80	161	208	230	150	144
84	165	213	236	154	148
88	169	218	242	157	151
92	173	223	248	161	155
94	175	226	251	163	157

<sup>(1)</sup> Above FL 200 add 1 kt per additional 1 000 ft.

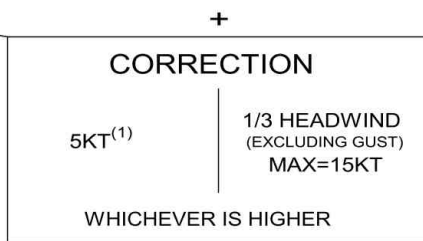
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

W(1000Kg)	52	56	60	64	68	72	76	80	84	88	92	94
VLS CONF FULL (KT)	116	121	125	129	133	137	141	144	148	151	155	157
VLS CONF 3 (KT)	121	125	130	134	138	142	146	150	154	157	161	163



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**VAPP**

$$V_{APP}^{(2)} = \text{MAX}(VLS + 5Kt^{(1)}; VLS + W_{IND} \text{ CORR})$$

1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
2. In case of ice accretion, Vapp must not be lower than:
  - VLS + 5 kt in CONF FULL
  - VLS + 10 kt in CONF 3

In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		860	900	940	980	1020	1070	1150	1370	1470	1570
	WET		1110	1180	1250	1330	1400	1470	1540	1670	1770	1860
	COVERED WITH	STANDING WATER	1550	1660	1760	1880	1990	2080	2200	2310	2420	2520
		SLUSH	1490	1580	1670	1770	1870	1980	2070	2170	2280	2370
		COMPACTED SNOW	1390	1460	1530	1600	1670	1730	1790	1850	1920	1980
		ICE	2780	2910	3050	3190	3310	3440	3560	3700	3830	3950
CORRECTION ON ACTUAL LANDING DISTANCE												
RUNWAY CONDITION	dry runway	wet runway	runway covered with									
			standing water	slush	compacted snow		ice					
per 1 000 ft above SL	+3 %	+4 %	+4 %		+5 %		+4 %		+5 %			
per 10 kt headwind	No correction for headwind due to wind correction on approach speed											
per 10 kt tailwind	+16 %	+21 %	+22 %		+21 %		+16 %		+26 %			
2 reversers operative	-5 %	-8 %	-17 %		-16 %		-11 %		-29 %			
Per 5 kt speed increment (and no failure) add 8 % (all runways)												

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 74 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 1 020 m

Read from the Corrections table,  
Pressure altitude correction: 3 x 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt no reversers) = 1020 x 1.06 x 1.08 = 1 170 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		820	850	890	930	970	1020	1080	1290	1380	1470
	WET		1040	1100	1160	1230	1290	1360	1430	1540	1640	1720
	COVERED WITH	STANDING WATER	1430	1530	1640	1740	1840	1940	2030	2140	2240	2340
		SLUSH	1390	1470	1560	1640	1730	1820	1920	2020	2120	2210
		COMPACTED SNOW	1310	1380	1440	1510	1570	1630	1680	1750	1810	1860
		ICE	2590	2720	2850	2970	3090	3210	3320	3450	3580	3690

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+4 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+16 %	+21 %	+24 %	+22 %	+16 %	+27 %
2 reversers operative	-4 %	-8 %	-16 %	-15 %	-11 %	-28 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW =74 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 970 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 970 × 1.06 × 1.08 = 1 120 m.

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		MODE	54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND
RUNWAY CONDITION												
DRY		MED LOW	1340 1920	1440 2100	1550 2290	1650 2460	1810 2640	1970 2810	+5 +3	0 0	+13 +15	-2 -2
WET		MED LOW	1410 1920	1540 2100	1690 2290	1830 2460	2010 2640	2200 2810	+6 +3	-3 0	+17 +15	-3 -2
COVERED WITH	STANDING WATER	MED	1770	1990	2210	2410	2640	2860	+6	-17	+21	-4
		LOW	1900	2090	2300	2490	2720	2940	+4	0	+18	-2
	SLUSH	MED	1700	1890	2100	2290	2490	2690	+7	-16	+21	-3
		LOW	1860	2030	2220	2400	2590	2790	+5	0	+17	-2
	COMPACTED SNOW	MED	1580	1700	1830	1940	2060	2170	+6	-12	+15	-2
LOW		1870	2050	2230	2390	2560	2730	+4	0	+15	-2	
	ICE	MED	2980	3240	3530	3780	4040	4290	+6	-29	+25	-4
		LOW	3000	3260	3550	3800	4060	4320	+5	-26	+26	-4

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING

- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE

WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	
RUNWAY CONDITION	MODE											
DRY		MED	1280	1370	1460	1530	1660	1800	+3	0	+13	-1
		LOW	1830	1990	2150	2300	2450	2590	+3	0	+14	-2
WET		MED	1330	1440	1560	1670	1820	1980	+4	-2	+16	-2
		LOW	1830	1990	2150	2300	2450	2590	+3	0	+14	-2
COVERED WITH	STANDING WATER	MED	1660	1830	2020	2190	2400	2580	+4	-16	+20	-3
		LOW	1810	1980	2150	2310	2490	2660	+4	0	+18	-2
	SLUSH	MED	1590	1760	1940	2080	2270	2440	+5	-16	+20	-3
		LOW	1770	1930	2080	2220	2380	2540	+5	0	+16	-2
	COMPACTED SNOW	MED	1500	1600	1710	1800	1890	1970	+4	-11	+14	-2
		LOW	1780	1940	2090	2230	2380	2520	+4	0	+14	-2
	ICE	MED	2790	3030	3270	3490	3720	3940	+5	-28	+25	-4
		LOW	2810	3050	3290	3510	3740	3960	+5	-26	+26	-4

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING

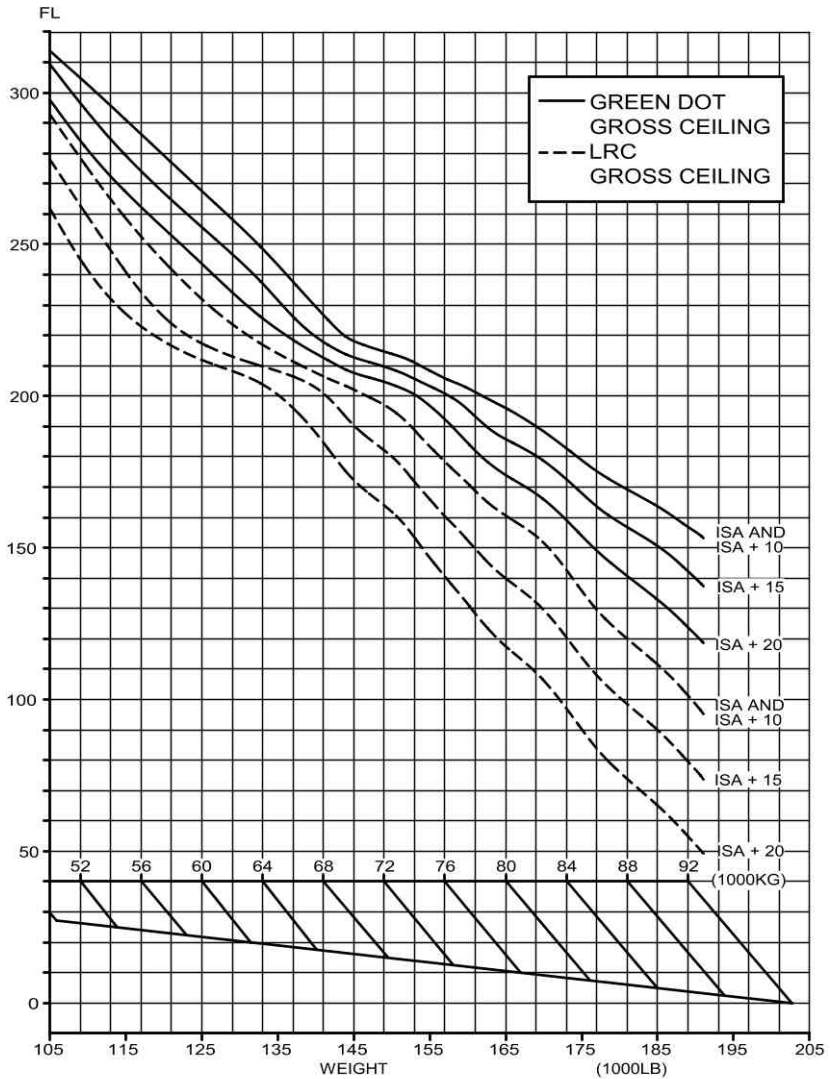
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).



## CEILINGS

### ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA	ISA + 10	ISA + 15	ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-1 300 ft	-1 400 ft	-1 400 ft
	TOTAL ANTI ICE ON	-2 800 ft	-2 800 ft	-2 800 ft	-3 000 ft
GREEN DOT	ENGINE ANTI ICE ON	-1 000 ft	-1 000 ft	-1 100 ft	-1 200 ft
	TOTAL ANTI ICE ON	-2 100 ft	-2 100 ft	-2 300 ft	-2 500 ft

Note: For weights 85 000 kg or 187 400 lb, one engine ceilings at Long Range speed may be overestimated by FMS Legacy. In this case, ceiling values provided in the above graph should be retained.

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>2/4</b> 30 MAR 12

## GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

### ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		DISTANCE (NM) INITIAL SPEED (KT)		TIME (MIN) FUEL(1000KG)
					LEVEL OFF (FT)		
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL						
	250	290	310	330	350	370	390
50				174 32 198 .9 31700	228 42 200 1.1 31800	262 47 202 1.3 31900	288 52 204 1.3 31900
54			156 29 202 .9 30100	222 41 204 1.2 30200	258 47 206 1.4 30300	285 52 208 1.5 30300	308 55 210 1.5 30400
58		152 29 206 .9 28200	231 43 208 1.3 28500	269 50 210 1.5 28600	298 54 212 1.7 28600	320 58 214 1.7 28700	339 61 216 1.8 28700
62		236 45 212 1.5 26400	279 52 214 1.7 26600	309 57 216 1.8 26600	333 61 218 1.9 26700	352 64 220 2.0 26700	369 67 222 2.1 26800
66	155 30 214 1.1 24200	281 53 218 1.8 24600	314 59 220 2.0 24600	339 63 222 2.1 24700	360 67 224 2.2 24700	378 69 226 2.3 24800	393 71 228 2.3 24800
70	231 45 220 1.7 22600	311 59 224 2.1 22800	335 63 226 2.2 22800	357 67 228 2.3 22900	376 70 230 2.4 22900	392 72 232 2.5 22900	406 74 234 2.5 23000
74	214 41 226 1.6 21300	278 53 230 2.0 21400	301 56 232 2.1 21400	321 60 234 2.2 21500	339 62 236 2.2 21500	354 65 238 2.3 21500	
78	212 40 232 1.6 20500	264 49 236 1.9 20600	283 52 238 2.0 20600	301 55 240 2.1 20600	316 57 242 2.2 20600	330 60 244 2.2 20600	
82	242 46 238 1.9 19600	282 52 242 2.1 19700	298 55 244 2.2 19700	313 57 246 2.3 19700	326 59 248 2.3 19800		
86	278 52 244 2.3 18400	317 58 248 2.5 18400	332 61 250 2.6 18500	346 63 252 2.6 18500	359 65 254 2.7 18500		
90	300 56 250 2.6 17100	335 61 254 2.7 17200	349 64 256 2.8 17200	363 66 258 2.9 17200			
94	317 59 256 2.8 15900	350 64 260 3.0 15900	363 66 262 3.0 16000	375 67 264 3.1 16000			
CORRECTIONS		DISTANCE		TIME	FUEL	LEVEL OFF	
ENGINE ANTI ICE ON		+ 15 %		+ 12 %	+ 18 %	- 200 FT	
TOTAL ANTI ICE ON		+ 20 %		+ 24 %	+ 33 %	- 700 FT	



## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)		MACH IAS (KT)	
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
50	1.181 .442	1.250 .480	1.319 .507	1.369 .530	1.417 .549	1.472 .571	
	1972 244	1915 241	1856 236	1874 237	1870 236	1875 236	
54	1.199 .454	1.281 .494	1.363 .529	1.411 .548	1.464 .569	1.520 .588	
	2093 251	2047 249	2029 246	2028 246	2032 245	2034 243	
58	1.223 .466	1.310 .506	1.402 .546	1.454 .567	1.510 .587	1.554 .591	
	2224 258	2174 255	2185 255	2190 254	2196 253	2138 244	
62	1.253 .484	1.344 .521	1.441 .562	1.497 .583	1.536 .585	1.568 .551	
	2387 268	2330 263	2343 262	2354 262	2277 252	2121 227	
66	1.278 .495	1.380 .538	1.480 .578	1.534 .595	1.548 .548		
	2519 274	2499 272	2504 270	2503 267	2252 235		
70	1.303 .506	1.412 .552	1.517 .591	1.547 .578			
	2651 280	2651 278	2667 277	2519 260			
74	1.327 .515	1.446 .567	1.549 .600	1.562 .528			
	2785 286	2818 286	2811 281	2482 236			
78	1.359 .531	1.478 .579	1.557 .577				
	2968 295	2979 293	2795 270				
82	1.385 .543	1.510 .592	1.574 .523				
	3124 301	3146 299	2758 243				
86	1.412 .554	1.519 .580					
	3282 308	3163 293					
90	1.440 .567	1.529 .559					
	3449 315	3158 282					
94	1.456 .569	1.549 .512					
	3540 316	3139 258					
ENGINE ANTI ICE ON △FUEL = + 2 %				TOTAL ANTI ICE ON △FUEL = + 4 %			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>4/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

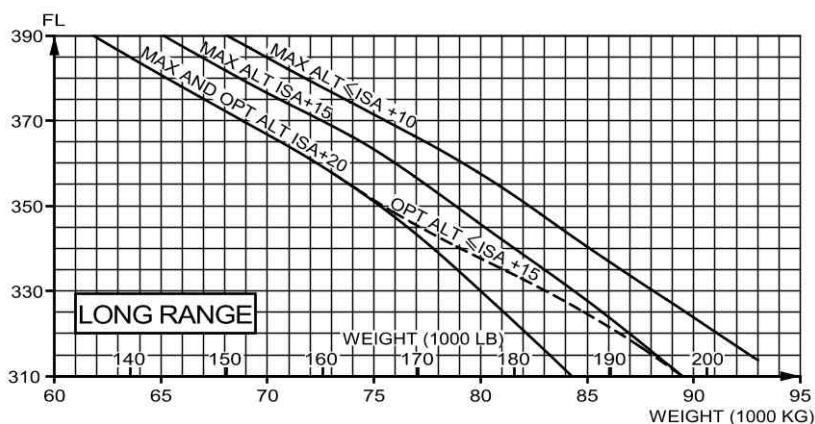
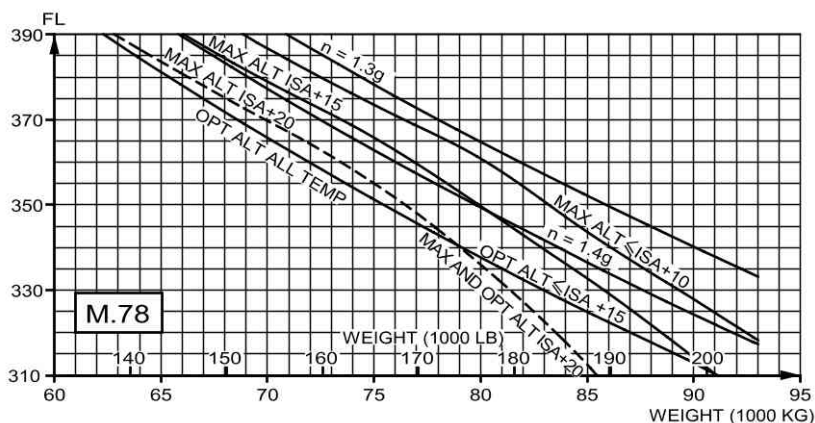
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
AIR DIST. (NM)		FLIGHT LEVEL					CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1510 0.46	1317 0.44	1180 0.42	1131 0.41	1083 0.41	1061 0.41	9	7	6
300	2259 1.06	2008 1.03	1826 0.59	1762 0.58	1699 0.57	1670 0.58	15	14	13
400	3004 1.27	2694 1.22	2468 1.17	2388 1.15	2312 1.14	2276 1.15	21	20	20
500	3745 1.47	3377 1.41	3106 1.34	3010 1.32	2921 1.31	2877 1.32	27	27	27
600	4481 2.08	4055 2.00	3739 1.52	3628 1.49	3527 1.48	3475 1.49	34	34	34
700	5212 2.28	4729 2.19	4369 2.10	4241 2.07	4129 2.04	4069 2.05	40	40	41
800	5938 2.49	5400 2.39	4994 2.28	4851 2.24	4727 2.21	4659 2.22	46	47	48
900	6659 3.10	6066 2.58	5615 2.46	5456 2.41	5320 2.38	5247 2.38	52	53	54
1000	7376 3.31	6728 3.17	6232 3.04	6058 2.59	5907 2.55	5831 2.55	58	60	61
1100	8088 3.52	7387 3.37	6845 3.22	6656 3.16	6490 3.12	6413 3.11	63	66	68
1200	8798 4.13	8042 3.56	7454 3.41	7250 3.34	7070 3.29	6991 3.28	69	73	74
1300	9506 4.34	8693 4.16	8059 3.59	7840 3.52	7645 3.46	7566 3.44	75	79	81
1400	10209 4.55	9340 4.36	8661 4.17	8427 4.10	8217 4.03	8137 4.00	81	86	87
ENGINE ANTI ICE ON △FUEL = + 2 %					TOTAL ANTI ICE ON △FUEL = + 4 %				

FLIP23 A321-131 IAE V2530-A5 3610 03301.001011 0250300 .7801 .000100 140 0300350 60 0 100100 40100 18590 CL-N0-04-07-150



## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 500 ft Opt ALT : - 300 ft	Max ALT : -1 100 ft Opt ALT : - 300 ft
ISA +15	Max ALT : - 700 ft Opt ALT : - 300 ft	Max ALT : -1 500 ft Opt ALT : - 600 ft
ISA +20	Max ALT : -1 000 ft Opt ALT : -1 000 ft	Max ALT : -2 300 ft Opt ALT : -2 300 ft

IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 – DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 65000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	1037 0.36	978 0.36	926 0.36	880 0.36	842 0.36	816 0.36	1	2	4
400	2281 1.02	2158 1.02	2049 1.02	1956 1.03	1885 1.03	1854 1.03	7	10	20
600	3518 1.27	3329 1.28	3164 1.29	3023 1.29	2918 1.30	2875 1.30	13	18	33
800	4747 1.53	4494 1.54	4271 1.55	4081 1.56	3939 1.56	3882 1.56	19	25	45
1000	5970 2.19	5650 2.20	5370 2.22	5131 2.23	4951 2.23	4874 2.23	25	33	57
1200	7185 2.45	6799 2.47	6461 2.48	6171 2.49	5952 2.50	5852 2.50	31	40	67
1400	8393 3.11	7941 3.13	7544 3.14	7204 3.16	6944 3.17	6816 3.17	36	47	77
1600	9596 3.37	9076 3.39	8620 3.41	8228 3.43	7925 3.44	7768 3.44	41	54	86
1800	10792 4.03	10205 4.05	9689 4.07	9244 4.09	8898 4.10	8707 4.10	46	60	94
2000	11983 4.29	11327 4.31	10751 4.34	10254 4.36	9865 4.37	9640 4.37	51	66	102
2200	13167 4.55	12442 4.58	11806 5.00	11256 5.03	10825 5.04	10566 5.04	56	73	110
2400	14345 5.21	13551 5.24	12855 5.26	12251 5.29	11776 5.31	11482 5.31	61	79	117
2600	15518 5.47	14654 5.50	13897 5.53	13239 5.56	12720 5.58	12388 5.58	65	85	125
2800	16685 6.13	15750 6.16	14932 6.19	14220 6.23	13657 6.24	13286 6.24	68	90	131
3000	17851 6.39	16841 6.42	15961 6.46	15195 6.49	14586 6.51	14175 6.51	72	96	138
ECON AIR CONDITIONING △FUEL = - 0.6 %			ENGINE ANTI ICE ON △FUEL = + 2 %			TOTAL ANTI ICE ON △FUEL = + 5 %			

FLIP22B A321-131 IAE V2530-A53610 03301.300211 0250300 .7800 .000200 140 0300350 65 0 100100 40100 18590

CL-N0-CL-004-009-1E0

COST INDEX FOR LONG RANGE CRUISE SPEED

ALL ENGINES

- For a quick determination of the  $CI_{LRC}$ , use:
- $CI_{LRC}$  = 50 kg/min in the FMGC.
  - or
  - $CI_{LRC}$  = 70 (100 lb/h) in the FMGC.



## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)	60				80				IAS (KT)
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.7	173	100	IDLE					241
370	15.9	166	95	IDLE	18.0	186	108	IDLE	252
350	15.2	159	90	IDLE	17.3	179	103	IDLE	264
330	14.6	153	85	IDLE	16.6	173	98	IDLE	277
310	14.0	148	81	IDLE	16.0	167	93	IDLE	289
290	13.5	143	76	IDLE	15.3	161	88	IDLE	300
270	12.8	137	71	IDLE	14.5	154	81	IDLE	300
250	12.1	131	66	IDLE	13.6	146	75	IDLE	300
240	11.7	127	63	IDLE	13.2	143	72	IDLE	300
220	11.0	121	58	IDLE	12.3	135	66	IDLE	300
200	10.2	114	53	IDLE	11.5	127	60	IDLE	300
180	9.5	108	48	IDLE	10.5	119	54	IDLE	300
160	8.7	100	43	IDLE	9.6	110	48	IDLE	300
140	7.9	93	39	IDLE	8.7	101	42	IDLE	300
120	7.1	85	34	IDLE	7.7	92	37	IDLE	300
100	6.3	76	29	IDLE	6.7	81	31	IDLE	300
50	2.4	30	10	IDLE	2.5	32	11	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		ECON AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		—		+ 1 min		+ 3 min		+ 0.2 %	
FUEL		— 2 %		+ 17 %		+ 90 %		+ 0.7 %	
DISTANCE		—		+ 4 %		+ 20 %		+ 0.4 %	

10B-08FA321-131IAEV2530-A523100000C5KG330001859000-1-350.015.0.00003.780300.000250.0000 FCOM-NO-03-05-30-002-150

# QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 120 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 100 KG (4MIN)									
REF. LDG WT AT DEST. = 60000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	601 0.12						2		
60	775 0.16						4		
80	950 0.20	898 0.19					5		
100	1124 0.23	1056 0.23	1035 0.22				6	6	
120	1299 0.27	1213 0.26	1172 0.26	1172 0.25			7	7	
140	1474 0.31	1371 0.30	1310 0.29	1294 0.28			8	8	
160	1649 0.35	1529 0.33	1447 0.32	1416 0.31	1423 0.31		9	8	10
180	1825 0.39	1687 0.37	1585 0.35	1539 0.35	1536 0.34	1547 0.33	10	9	12
200	2000 0.43	1845 0.40	1723 0.38	1662 0.38	1650 0.36	1654 0.36	11	10	13
220	2176 0.46	2003 0.44	1860 0.42	1784 0.41	1763 0.39	1761 0.39	12	10	14
240	2352 0.50	2161 0.47	1998 0.45	1907 0.44	1877 0.42	1869 0.41	13	11	15
260	2529 0.54	2320 0.50	2136 0.48	2030 0.47	1991 0.45	1976 0.44	15	12	16
280	2705 0.58	2479 0.54	2274 0.51	2153 0.50	2105 0.48	2084 0.47	16	13	17
300	2882 1.02	2638 0.57	2413 0.54	2277 0.53	2220 0.51	2192 0.50	17	13	18
320	3059 1.05	2797 1.01	2551 0.58	2400 0.57	2334 0.54	2300 0.53	18	14	20
340	3236 1.09	2956 1.04	2689 1.01	2524 1.00	2449 0.57	2408 0.55	19	15	21
360	3414 1.13	3115 1.07	2828 1.04	2647 1.03	2563 1.00	2516 0.58	20	16	22
380	3591 1.17	3275 1.11	2966 1.07	2771 1.06	2678 1.03	2625 1.01	21	16	23
400	3769 1.21	3435 1.14	3105 1.10	2895 1.09	2793 1.06	2733 1.04	22	17	24
420	3947 1.24	3594 1.18	3243 1.14	3019 1.12	2908 1.09	2842 1.06	23	18	25
440	4125 1.28	3754 1.21	3382 1.17	3143 1.15	3023 1.12	2951 1.09	25	19	26
460	4304 1.32	3915 1.24	3521 1.20	3267 1.18	3138 1.15	3060 1.12	26	20	27
480	4482 1.35	4075 1.28	3660 1.23	3392 1.21	3253 1.18	3169 1.15	27	20	28
500	4661 1.39	4235 1.31	3799 1.26	3516 1.25	3369 1.21	3278 1.18	28	21	30
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 4 %			ΔFUEL = + 6 %			

CL-W0-04-13-155

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-CAB</b> <b>1/2</b> 30 MAR 12
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## IN CRUISE QUICK CHECK FL 100 LONG RANGE

### FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING CRUISE : LONG RANGE - DESCENT : 250KT IMC PROCEDURE : 140 KG (6MIN)								FL100
NORMAL AIR CONDITIONING ANTI-icing OFF			ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)							
	65	70	75	80	85	90	95	
40	337 0.15	339 0.15	342 0.15	347 0.15	353 0.15	361 0.15	370 0.15	
60	515 0.18	523 0.18	531 0.18	540 0.18	551 0.18	561 0.18	571 0.18	
80	693 0.22	706 0.22	719 0.21	733 0.21	748 0.21	761 0.21	773 0.21	
100	871 0.26	890 0.25	908 0.25	926 0.24	945 0.24	960 0.24	975 0.24	
120	1048 0.30	1073 0.29	1096 0.28	1119 0.28	1141 0.27	1160 0.27	1176 0.27	
140	1226 0.33	1256 0.32	1284 0.31	1312 0.31	1338 0.30	1359 0.30	1378 0.30	
160	1403 0.37	1438 0.36	1472 0.35	1504 0.34	1534 0.33	1559 0.33	1580 0.33	
180	1580 0.41	1621 0.39	1659 0.38	1696 0.37	1731 0.36	1758 0.36	1782 0.36	
200	1757 0.45	1803 0.43	1846 0.42	1888 0.41	1927 0.39	1957 0.39	1984 0.39	
220	1933 0.48	1985 0.46	2034 0.45	2080 0.44	2123 0.43	2156 0.42	2185 0.42	
240	2110 0.52	2167 0.50	2221 0.48	2271 0.47	2319 0.46	2355 0.45	2387 0.45	
260	2286 0.56	2349 0.53	2407 0.52	2463 0.51	2515 0.49	2554 0.48	2589 0.48	
280	2462 1.00	2530 0.57	2594 0.55	2654 0.54	2710 0.52	2753 0.51	2791 0.51	
300	2637 1.04	2711 1.00	2780 0.58	2845 0.57	2906 0.55	2952 0.54	2993 0.54	
320	2813 1.07	2892 1.04	2967 1.02	3036 1.00	3101 0.59	3150 0.57	3195 0.57	
340	2988 1.11	3073 1.07	3153 1.05	3227 1.04	3296 1.02	3349 1.00	3397 1.00	
360	3164 1.15	3254 1.11	3339 1.09	3417 1.07	3491 1.05	3547 1.03	3599 1.03	
380	3339 1.19	3434 1.15	3524 1.12	3608 1.10	3686 1.08	3745 1.05	3800 1.05	
400	3513 1.23	3615 1.18	3710 1.15	3798 1.14	3881 1.12	3943 1.08	4001 1.08	
420	3688 1.26	3795 1.22	3895 1.19	3988 1.17	4076 1.15	4141 1.11	4202 1.11	
440	3862 1.30	3975 1.25	4080 1.22	4177 1.20	4270 1.18	4339 1.14	4402 1.14	
460	4037 1.34	4154 1.29	4265 1.26	4367 1.24	4465 1.22	4537 1.17	4603 1.17	
480	4211 1.38	4334 1.33	4450 1.29	4557 1.27	4659 1.25	4735 1.20	4803 1.20	
500	4384 1.42	4513 1.36	4635 1.33	4746 1.30	4853 1.28	4932 1.23	5003 1.23	
520	4558 1.46	4692 1.40	4819 1.36	4935 1.34	5047 1.32	5130 1.26	5203 1.26	
540	4732 1.49	4871 1.43	5003 1.40	5124 1.37	5241 1.35	5327 1.29	5403 1.29	
AIR CONDITIONING OFF △FUEL = - 2 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 5 %			

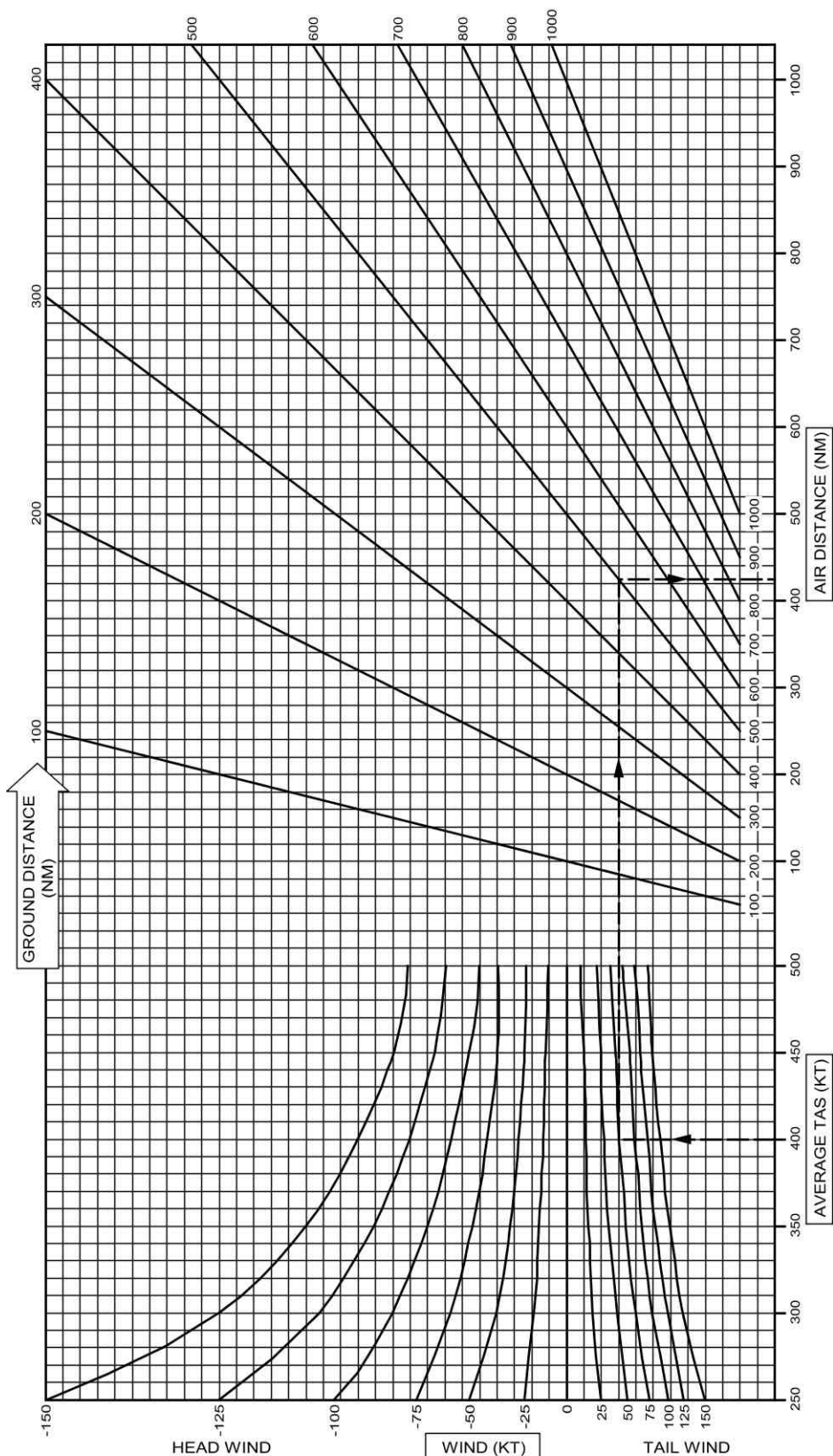
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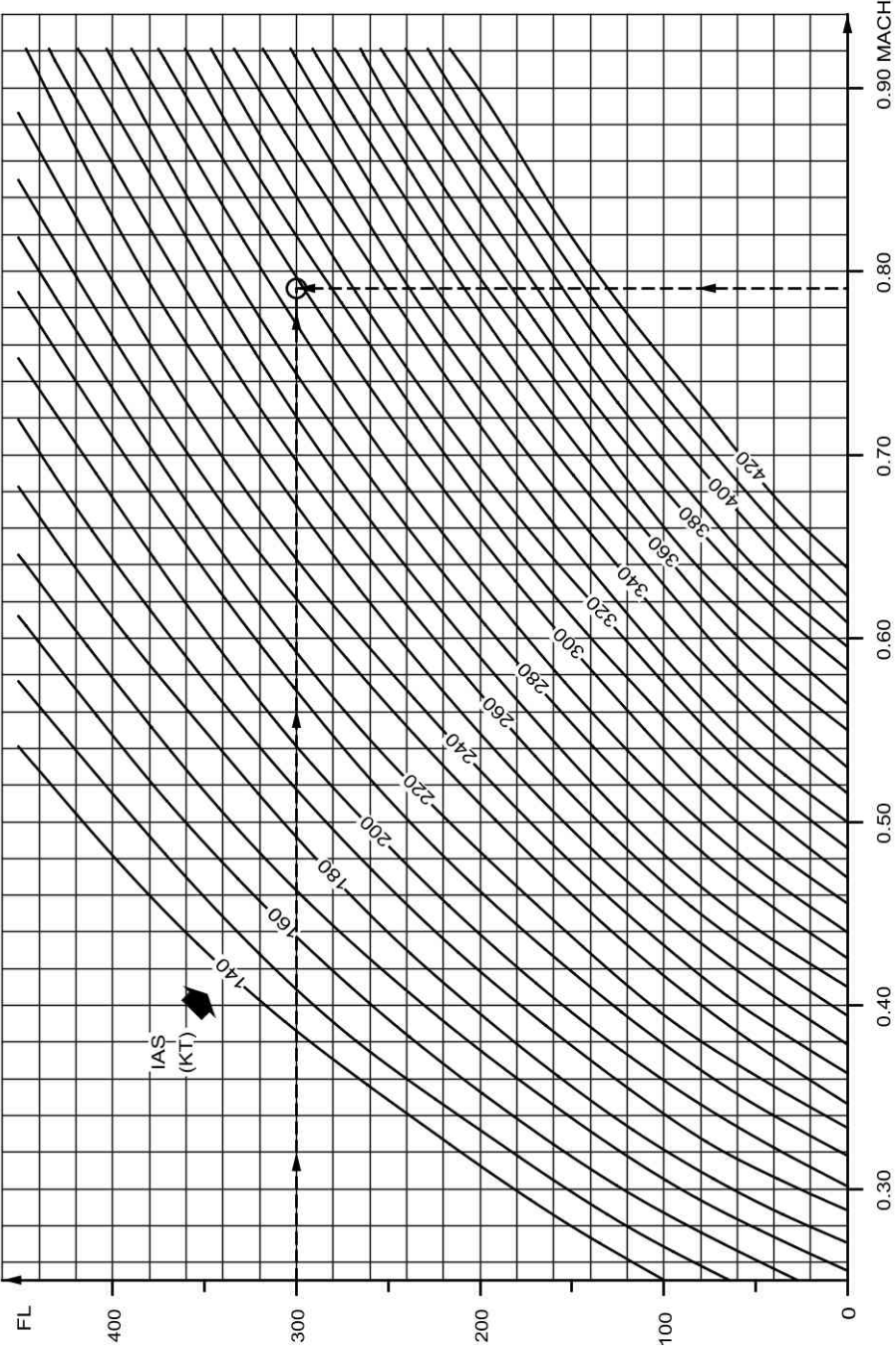




## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

***Note:** In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.*

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

***Note:** Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:*

- *Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or*
- *If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.*

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**Hydraulic Architecture..... OPS.02**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)										
		54	58	62	66	70	74	78	82	86	90	94
		N1 %										
390	0.76	79.4	80.6	-	-	-	-	-	-	-	-	-
370	0.76	77.9	78.9	80.0	81.2	-	-	-	-	-	-	-
350	0.76	77.2	77.9	78.8	79.7	80.7	-	-	-	-	-	-
330	0.76	76.9	77.6	78.2	79.0	79.8	80.7	81.6	-	-	-	-
310	0.76	76.7	77.3	77.9	78.5	79.2	79.9	80.6	81.5	82.4	-	-
290	0.76	76.7	77.2	77.7	78.2	78.8	79.4	80.0	80.6	81.4	82.1	83.0
270	300	76.2	76.6	77.0	77.5	78.0	78.5	79.1	79.6	80.3	80.9	81.6
250	300	75.0	75.4	75.8	76.2	76.7	77.1	77.7	78.2	78.9	79.5	80.2
200	300	72.2	72.5	72.9	73.3	73.7	74.2	74.7	75.2	75.8	76.4	77.0
150	270	65.5	65.9	66.5	67.0	67.7	68.4	69.2	70.3	71.0	71.8	72.6
100	270	62.5	62.9	63.5	64.0	64.6	65.3	66.0	66.8	67.6	68.4	69.2
50	270	59.1	59.5	60.0	60.5	61.1	61.8	62.6	63.4	64.2	65.0	65.7

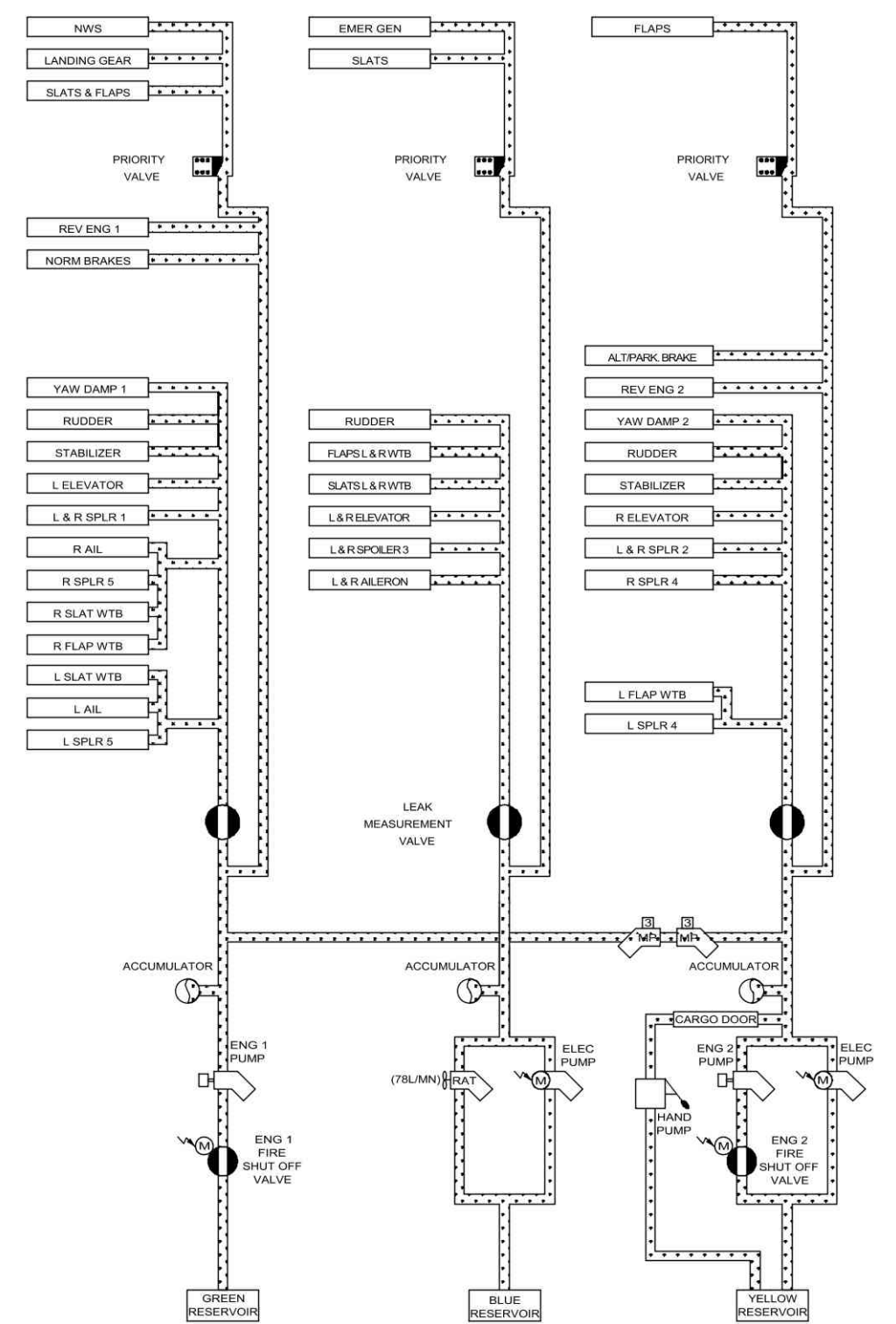
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

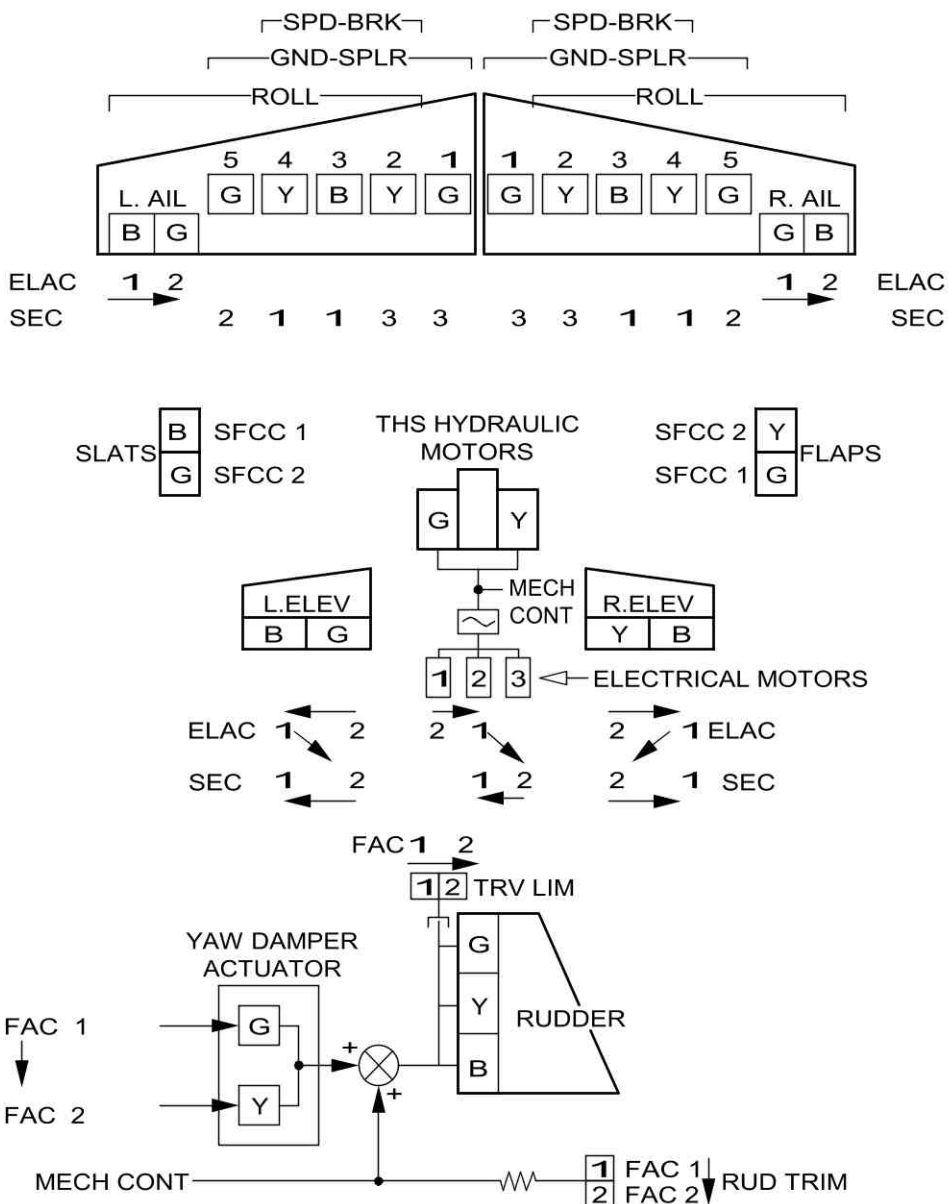
A/THR in managed speed.....USE

HYDRAULIC ARCHITECTURE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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**OEBPROC-28 No Localizer or Glide Slope Capture in Approach**

**No Localizer or Glide Slope Capture in Approach.....28.00**  
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**OEBPROC-30 No SRS Engagement During Go Around Below MDA**

**No SRS Engagement During Go Around Below MDA..... 30.00**  
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**OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

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**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**


**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.00**  
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**OEBPROC-43 F/CTL SPOILER FAULT**

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## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an ENG 1(2) OIL FILTER CLOG ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTD					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTD					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*


Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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Approved by: Head of Flight Operations Support and Services

Refer to the "Cancelled by" section of the associated FCOM OEB.

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## NO LOCALIZER OR GLIDE SLOPE CAPTURE IN APPROACH

### ECAM ENTRY

None

### PROCEDURE

In accordance with the FCOM Standard Operating Procedures (*Refer to FCOM/PRO-NOR-SOP-18 ILS Approach Pattern*), the flight crew should closely monitor the localizer and glide slope capture, for every ILS approach.

- **If LOC\* mode does not engage when expected, the flight crew should:**

Perform the ILS interception using the LOC raw data deviations. The FD and AP can be used in selected modes (HDG-V/S modes, or preferably TRK-FPA modes) for this purpose.

Consider changing the Master FMGC:

- **If the AP is engaged:**

Change the AP in command

*(If AP1+2 are engaged, change to AP2, by pressing the AP1 pb on the FCU to disengage AP1)*

- **If the AP is disengaged, and the FDs are engaged:**

Turn off FD1

Then, attempt to reengage the LOC and G/S modes, by pressing the APPR pb.

LOC\* (G/S\*) mode should engage as expected, and the ILS can then be flown in LOC and G/S modes. However, the flight crew should disregard the approach capability on the FMA, and perform only a CAT I approach with a manual landing.

Note: *If it is still not possible to intercept the ILS after changing the Master FMGC, the flight crew must perform an ILS approach using raw data. The AP/FD can be used in selected modes (HDG/VS, or preferably TRK/FPA). The flight crew should disarm the APPR (LOC) mode(s) by setting the APPR (LOC) pb to OFF on the FCU, and then perform a CAT I approach with a manual landing.*

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# OEB30 Issue 1.0

## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.


**Reason for issue:** This OEB replaces the A320 OEB 188.  
 One Operator reported a case where the flight crew initiated a Go Around slightly below the Minimum Descent Altitude (MDA), and the aircraft did not pitch up as expected. The flight crew performed a non precision approach (a VORDME approach) using the FINAL APP managed guidance mode with the AP1 (Autopilot) engaged during the final approach.  
 This OEB is issued to provide flight crews with an operational procedure to avoid such aircraft behavior.  
 The operational procedure provided in this OEB applies to all Non Precision Approaches, for both conventional approaches and RNAV approaches, flown in FINAL APP managed guidance mode.

**Applicable to:** All A318/A319/A320/A321 aircraft

**Cancelled by:** Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.  
 Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		30.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013526.0002001	30 MAR 12
Criteria: SA Applicable to: B-HTD					
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013527.0002001	30 MAR 12
Criteria: SA Applicable to: B-HTD					



## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

### ECAM ENTRY

None

### PROCEDURE

During a non precision approach, when using the FINAL APP managed guidance mode:

- **At DA(DH) or MDA(MDH), or earlier in approach if visual conditions are obtained:**

DISENGAGE the FINAL APP mode by pressing the APPR pushbutton on the FCU.

When the flight crew presses the APPR pb in order to disengage the FINAL APP managed guidance mode, a basic vertical guidance mode, either V/S or FPA, engages.

This ensures that the SRS and GA TRK guidance modes correctly engage, if the flight crew initiates a go-around slightly below MDA (MDH).

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	<b>BLANK</b>
		30 MAR 12

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HTD				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HTD				





## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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		30 MAR 12

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTD				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTD				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTD				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTD				





## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



# AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).



## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTD				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTD				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>44.00</b> 30 MAR 12
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## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTD				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTD				





## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

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		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HTE**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date

No filing instructions


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HTE</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HTE</b>				
	OEB30 issue 1.0	W	N	30 MAR 12	No SRS Engagement During Go Around Below MDA
	Criteria: SA <b>Applicable to: B-HTE</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HTE</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HTE</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HTE</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HTE</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
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<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
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	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
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	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
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	FPE-AEO	All Engines Operative	30 MAR 12
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	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-30	No SRS Engagement During Go Around Below MDA	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


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M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HTE</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	1024	HDA 0102	B-HTE	321-231


(1) Evolution code : N=New, R=Revised

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	K2113		30 AUG 10	FUSELAGE - REAR FUSELAGE SECTION 16A - DEFINE A321 BASIC STRUCTURE
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	27-1189 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L94 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	27-1182 03		25 NOV 11	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L93 SOFTWARE STANDARD.
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	Applicable to: ALL			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	Applicable to: ALL			
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	Applicable to: ALL			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	Applicable to: ALL			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	Applicable to: ALL			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	Applicable to: ALL			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	Applicable to: ALL			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	Applicable to: ALL			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	Applicable to: ALL			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	Applicable to: ALL			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	Applicable to: ALL			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	Applicable to: ALL			
	P5769		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF NEW RAIN REPELLENT
	Applicable to: ALL			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	Applicable to: ALL			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	Applicable to: ALL			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	Applicable to: ALL			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	Applicable to: ALL			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	Applicable to: ALL			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			
	P1872		30 AUG 10	AIR CONDITIONING - INSTALL CIRCUIT BREAKER FOR REAR CARGO COMPT VALVES FOR EROPS -
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			


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	P3341		30 AUG 10	LANDING GEAR - WHEELS AND BRAKES - INSTALLATION OF MESSIER GOODRICH WHEELS AND BRAKES ON A321
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	<b>Applicable to: ALL</b>			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	<b>Applicable to: ALL</b>			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	<b>Applicable to: ALL</b>			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	<b>Applicable to: ALL</b>			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	<b>Applicable to: ALL</b>			
	32-1369 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INTRODUCE BSCU STD 10.1 - SB ONLY.
	<b>Applicable to: ALL</b>			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	<b>Applicable to: ALL</b>			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	<b>Applicable to: ALL</b>			
	K0070		30 AUG 10	AIR CONDITIONING - CARGO COMPARTMENT - VENTILATION - INSTALL SYSTEM IN AFT COMPARTMENT -
	<b>Applicable to: ALL</b>			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	<b>Applicable to: ALL</b>			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	<b>Applicable to: ALL</b>			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	<b>Applicable to: ALL</b>			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	<b>Applicable to: ALL</b>			
	31-1141 04		30 AUG 10	INDICATING/RECORDING SYSTEMS - FWS - INTRODUCE FWC STANDARD H1P-E3P.
	<b>Applicable to: ALL</b>			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			

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	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	<b>Applicable to: ALL</b>			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	<b>Applicable to: ALL</b>			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	<b>Applicable to: ALL</b>			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	<b>Applicable to: ALL</b>			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : Index of the back cover page interior                                                                                           |
| C3              | : Index of the back cover page exterior                                                                                           |
| "BLANK"         | : Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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## **ABN-PLP PRELIMINARY PAGES**

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## **ABN-21 Air Conditioning/Ventilation/Pressurization**

<b>CABIN OVERPRESSURE.....</b>	<b>21.01</b>
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## **ABN-22 Auto Flight**

<b>LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset).....</b>	<b>22.01</b>
<b>LOW ENERGY WARNING.....</b>	<b>22.02</b>

## **ABN-24 Electrical**

<b>ELEC EMER CONFIG SYS Remaining.....</b>	<b>24.01</b>
<b>ELEC EMER CONFIG Summary.....</b>	<b>24.02</b>

## **ABN-25 Equipment**

<b>COCKPIT DOOR FAULT.....</b>	<b>25.01</b>
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## **ABN-26 Fire Protection**

<b>■ SMOKE/FUMES REMOVAL ■.....</b>	<b>26.01</b>
<b>■ SMOKE/FUMES/AVNCS SMOKE ■.....</b>	<b>26.02</b>

## **ABN-27 Flight Controls**

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<b>SIDESTICK/RUDDER PEDALS STIFF.....</b>	<b>27.03</b>
<b>RUDDER JAM.....</b>	<b>27.04</b>
<b>STABILIZER JAM.....</b>	<b>27.05</b>

## **ABN-28 Fuel**

<b>FUEL IMBALANCE.....</b>	<b>28.01</b>
<b>FUEL LEAK.....</b>	<b>28.02</b>
<b>GRVTY FUEL FEEDING.....</b>	<b>28.03</b>

## **ABN-29 Hydraulic**

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<b>HYD G + B SYS LO PR Summary.....</b>	<b>29.02</b>
<b>HYD G + Y SYS LO PR Summary.....</b>	<b>29.03</b>

## **ABN-30 Ice and Rain Protection**

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**ABN-31 Indicating / Recording Systems**

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ECAM SINGLE DISPLAY.....	31.02

**ABN-32 Landing Gear**

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L/G GRAVITY EXTENSION.....	32.03
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**ABN-70 Engines**

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<b>CABIN OVERPRESSURE</b>		
Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure		
PACK 1 or 2..... OFF		
BLOWER + EXTRACT..... OVRD		
<i>Cabin air is extracted overboard.</i>		
$\Delta P$ ..... FREQUENTLY MONITOR		
● If $\Delta P > 9$ PSI		
PACK 1+2..... OFF		
<b>LAND ASAP</b>		
Before 10 min from landing:		
PACK 1+2..... OFF		
BLOWER + EXTRACT..... AUTO		
<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.	

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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The “CAB PR LDG ELEV FAULT” message is displayed on the ECAM
- A “MAP NOT AVAIL” message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		



**ELEC EMER CONFIG SYS REMAINING**

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	AFT CRG ISOL VALVE	Norm	Inop	Inop
	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
COM	FCU	ch 1 only	ch 1 only	ch 1 only
	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
EMER EQPT	LOUDSPEAKER 1	Norm	Norm	Norm
	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
FIRE	SLIDES ARM/WARN	Norm	Norm	Norm
	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
	ELAC	N° 1 only	N° 1+ N° 2	N° 1+ N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
FUEL	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
HYD	TRANSFER VALVE	Norm	Inop	Inop
	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
FLT INS	ECAM CONT. panel	Norm	Norm	Norm
	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



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ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a)

Restored, when speed is below 100 kt.

(b)

Crew oxygen valve inoperative.

(c)

Lost, when speed is below 50 kt.

(d)

Lost 30 s after last engine shutdown.

(e)


IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f)

For APU start only.

(g)

Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK USABLE BY GRAVITY (2T UNUSABLE) <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	52	56	60	64	68	72	76	80	84	88	92	94
<b>VREF = VLS CONF FULL</b>	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV										
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94
DRY runway	2 260	2 340	2 450	2 560	2 670	2 810	2 970	3 550	3 800	4 050
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.20									
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.95									
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind				
DRY Runway	+3 %					+16 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.

In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT.....

ON
- If fuel vapors:**

CAB FANS.....

ON

PACK 1+2.....

OFF
- If no fuel vapors:**

CAB FANS.....

OFF

ECON FLOW.....

OFF
- LDG ELEV.....

10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude).....

INITIATE
- ATC.....

NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC.....

CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*
- At FL 100 or MEA**

APU MASTER SW (if in ELEC EMER CONF).....

ON

PACK 1+2.....

OFF

MODE SEL.....

MAN

MAN V/S CTL.....

FULL UP

RAM AIR.....

ON

APU MASTER SW.....

OFF
- If smoke persists, open CKPT window:**

MAX SPEED.....

200 KT

COCKPIT DOOR.....

OPEN

HEADSETS.....

ON

PNF COCKPIT WINDOW.....

OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALLEY..... OFF

SIGNS..... ON

CKPT/CABIN COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMER
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT..... ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATED:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100 or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ELEC EMER CONFIG..... CONSIDER  
*Refer to the end of the procedure to set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING..... CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

- **IF AIR COND SMOKE SUSPECTED:**  
 APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 CARGO AFT ISOL VALVE..... OFF  
 PACK 1..... OFF  
 ● **If smoke continues:**  
 PACK 1..... ON  
 PACK 2..... OFF  
 ● **If smoke still continues:**  
 PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ● **IF CAB EQUIPMENT SMOKE SUSPECTED:**  
 ● **If smoke continues:**  
 EMER EXIT LIGHT..... ON  
 BUS TIE..... OFF  
 GEN 2..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE  
 ● **If smoke still continues or if faulty  
equipment confirmed isolated:**  
 GEN 2..... ON  
 BUS TIE..... AUTO



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

- If faulty equipment not confirmed isolated, before L/G extension:  
 GEN 2..... ON  
 BUS TIE.....AUTO  
 SMOKE/FUMES REMOVAL..... CONSIDER

**UNDETERMINED/AVNCS/ELECTRICAL SMOKE**

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
 ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
 NORMAL VENTILATION..... RESTORE

**TO SET ELEC EMER CONFIG**

- EMER ELEC GEN 1 LINE.....OFF  
 EMER ELEC PWR..... MAN ON
- WHEN EMER GEN AVAIL:  
 APU GEN..... OFF  
 GEN 2..... OFF

ELEC EMER CONFIG  
 APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- AT 3 min OR 2 000 ft AAL BEFORE LANDING:  
 GEN 2..... ON  
 EMER ELEC GEN 1 LINE..... ON
- WHEN A/C IS STOPPED:  
 ALL GEN..... OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt

Note:

- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.


MAX SPEED

Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
Slats					
S = 0	NO LIMITATION	215 kt	215 kt	195 kt	190 kt (Not allowed)
0 < S < 1	230 kt				190 kt
S = 1					
1 < S ≤ 3	215 kt		215 kt	195 kt	190 kt
S > 3	190 kt		190 kt	190 kt	190 kt

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.



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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM  
CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

**STABILIZER JAM**

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

● **IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

● **IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP

FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

<b>CAUTION</b>	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON  
CTR TK L+R XFR..... OFF

- **On the lighter side:**  
FUEL PUMPS.....OFF
- **When fuel is balanced:**  
FUEL PUMPS..... ON  
CTR TK L+R XFR..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- A tank is overflowing (due to pipe rupture in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each wing tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK L+R XFR..... OFF

*Each engine is fed via its associated wing tank only.*

WING TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each wing tank.*

#### ■ CASE 1 : IF ONE WING TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side).....IDLE  
 ENG MASTER (engine on leaking side).....OFF  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the wing tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

CTR TK L+R XFR..... ON  
 FUEL X FEED.....USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The wing tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER  
 CTR TK XFR (non-leaking side)..... ON

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2 : IF BOTH WING TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*

- **When fuel quantity in one wing tank is less than 3 t (6 600 lb ):**  
 CTR TK L+R XFR..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF

● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:


If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE



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## HYD B + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/.77  
 MANEUVER WITH CARE  
 Flight controls remain in normal law.

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR

W (1 000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW/FLAPS SLOW  
 GPWS LDG FLAP 3..... ON  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE** Only one ELEV and two spoilers per wing  
**SPOILERS** Only 2 per wing  
**REVERSER** Only N°1  
**BRAKING** NORMAL  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>											
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94	
<b>DRY runway</b>	1 400	1 450	1 520	1 590	1 650	1 740	1 840	2 200	2 350	2 500	
<b>WET runway</b>	1 880	1 980	2 090	2 220	2 330	2 450	2 580	2 780	2 960	3 100	
<b>CONTA runway</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75										

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 16 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
DRY runway	1 520	1 580	1 650	1 730	1 800	1 890	2 000	2 390	2 560	2 720	
WET runway	2 030	2 150	2 270	2 400	2 520	2 660	2 790	3 010	3 200	3 360	
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.80										

(1) If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 16 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/0.77  
 MANEUVER WITH CARE  
 ALTN LAW : PROT LOST

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 30 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW / FLAPS JAMMED  
 GPWS FLAP MODE..... OFF  
 ● **For Flaps extension:**  
 SPD SEL..... VFE NEXT - 5KT  
 When in landing CONF : DECELERATE TO CALCULATED VAPP  
 Stabilize at VAPP before L/G down, to be trimmed for approach.  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE:** PITCH AUTHORITY REDUCED (No stabilizer).  
 MAN TRIM Unusable  
 Only 1 spoiler per wing – Direct law  
**SPOILERS:** Only 1 per wing  
**NO REVERSER**  
**BRAKING:** BRK Y ACCU PR ONLY (7 applications)  
 MAX BRK PR 1 000 PSI  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption  
 ● **For circuit:**  
 MAINTAIN SLATS/FLAPS CONFIGURATION  
 Recommended speed: MAX SPD - 10 kt  
 ● **For diversion:**  
 ● **If Flaps at zero:**  
 SELECT CLEAN CONFIGURATION  
 Normal operating speeds  
 ● **If Flaps not at zero:**  
 MAINTAIN SLATS/FLAPS CONFIG  
 Recommended speed: MAX SPD - 10 kt

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
<b>DRY runway</b>	2 050	2 130	2 230	2 330	2 430	2 550	2 700	3 230	3 450	3 680	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.05										
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.00										
<b>CORRECTIONS</b>	+ 1 000 ft above SL					+ 10 kt tailwind					
<b>DRY runway</b>	+ 3 %					+ 16 %					

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*





## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL</b> SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOME LT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.

Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.



LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

- **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP  
*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF  
*Shutdown the engines before nose impact.*

- **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF  
*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP  
*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN  
*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

- **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF  
*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°


**WHEN A/C STOPPED**

ENG (all) and APU FIRE pushbutton..... PUSH  
*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

- **If Evacuation required:**

EVACUATION..... INITIATE

  - All emergency and passenger doors may be used to evacuate the aircraft.
  - Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

- **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY  
*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW

### (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC.....APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT



ADR 1 + 2 + 3 FAULT (Cont'd)


● DURING FINAL APPR

V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*

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## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

- The following procedure is not displayed on the ECAM:
- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.
  - **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.
    - **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
    - **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
  - **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.

EGPWS ALERTS

<b>CAUTION</b>	During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis. During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.
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- **“PULL UP” – “TERRAIN TERRAIN PULL UP” – “TERRAIN AHEAD PULL UP” - “OBSTACLE AHEAD PULL UP”:**

Simultaneously:

AP..... OFF  
 PITCH..... PULL UP  
*Pull to full backstick and maintain in that position.*  
 THRUST LEVERS..... TOGA  
 SPEED BRAKES lever..... CHECK RETRACTED  
 BANK..... WINGS LEVEL or ADJUST

- **When flight path is safe and the warning stops:**  
 Decrease pitch attitude and accelerate.
- **When speed is above VLS, and vertical speed is positive:**  
 Clean up aircraft as required.
- **“TERRAIN TERRAIN” “TOO LOW TERRAIN”:**  
 Adjust the flight path or initiate a go-around.
- **"TERRAIN AHEAD"- "OBSTACLE AHEAD":**  
 Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.
- **“SINK RATE” “DON’T SINK”:**  
 Adjust pitch attitude and thrust to silence the alert.
- **“TOO LOW GEAR” - “TOO LOW FLAPS”:**  
 Perform a go-around.
- **“GLIDE SLOPE”:**  
 Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
 ALIGN light on during 30 s.  
 ATT MODE displayed on CDU.
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

- If “H” is written on the “5” key:
 

H KEY..... PRESS  
 Degree marker, 0 decimal point, ENT and CLR lights come on.

A/C HEADING..... ENTER
- If “H” is not written on the “5” key:
 

A/C HEADING..... ENTER  
 Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.  
 Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.  
 Heading will be displayed on the associated ND.  
 “HDG-ATT MODE” will be displayed on CDU.

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and  $V_{MAX}$ .*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 81 t	81 t-68 t	Below 68 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	4.0/70.7	4.0/66.4	4.0/61.5
2	F	7.0/68.9	7.0/64.6	7.0/59.9
1 + F	S	3.5/67.6	3.0/63.8	3.0/58.6
1	S	7.5/65.5	7.5/61.4	7.5/56.5
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200 -FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.





## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR..... KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF..... USE FLAP 3

APP SPD..... VLS +10

LDG DIST PROC..... APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST..... CLB

FLAPS..... RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	270 kt	8.5/CLB	9.0/CLB	10.0/CLB
FL 50 - FL 100		8.0/CLB	8.0/CLB	9.0/CLB
FL 100 - FL 150		7.0/CLB	7.0/CLB	8.0/CLB
FL 150 - FL 200		6.0/CLB	6.0/CLB	6.5/CLB
FL 200 - FL 250	300 kt	4.0/CLB	4.0/CLB	4.0/CLB
FL 250 - FL 280		3.5/CLB	3.0/CLB	3.0/CLB
Above FL 280	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200-FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 280	M 0.76	-1.0/IDLE	-1.5/IDLE	-2.0/IDLE
FL 280-FL 200	300 kt	-0.5/IDLE	-1.5/IDLE	-2.5/IDLE
FL 200 - FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-1.5/IDLE
Below FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-2.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.0/IDLE	2.0/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.0/63.4	5.0/59.4	5.0/54.6
1	S	7.5/65.6	7.5/61.4	7.5/56.6
1+F <sup>(1)</sup>	S	3.5/67.6	3.0/63.8	3.0/58.6
2	F	7.0/68.5	7.0/64.7	7.0/59.9



UNRELIABLE SPEED INDICATION/ADR  
CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	4.0/74.8	4.0/71.0	4.0/65.8

(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.

FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	2.0/60.0	2.0/56.0	1.5/51.6

FLYING TECHNIQUE TO STABILIZE SPEED:

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target.  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

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## **AIR DUAL BLEED FAULT**

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :  
 X BLEED..... CHECK OPEN  
 DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
 APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
 WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
 APU BLEED..... ON  
 MAX FL200  
 AVOID ICING CONDITIONS
  - IF ICE ACCRETION  
 APPR SPD.....VLS + 10 KT  
 LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

ENG DUAL FAILURE - FUEL REMAINING


Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :  
**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
THR LEVERS..... IDLE  
FAC 1.....OFF THEN ON  
ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.  
OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an “ENG DUAL FAILURE” during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*  
*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 60 000 kg/132 000 lb	-2.5
70 000 kg/154 000 lb	-1.5
80 000 kg/176 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.4 nm per 1 000 ft (with no wind).*  
LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*  
VHF1/HF1  /ATC1.....USE  
ATC.....NOTIFY

- **IF NO RELIGHT AFTER 30 SEC:**  
ENG MASTERS..... OFF 30 S/ON  
*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*
- **IF UNSUCCESSFUL:**  
CREW OXY MASKS (Above FL 100).....ON
  - **WHEN BELOW FL 250**  
APU (IF AVAIL)..... START
  - **WHEN BELOW FL 200**  
WING ANTI ICE..... OFF  
APU BLEED..... ON  
ENG MASTERS (one at a time)..... OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
94	251	261	271
92	248	258	268
88	242	252	262
86	239	249	259
84	236	246	256
82	233	243	253
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 700 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
GALLEY.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 and L/G DOWN) will be approximately 1.1 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.  
MIN APPR SPEED.....160 KT





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE

*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**

- **When in CONF 3 and VAPP:**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*

- **When L/G downlocked**

L/G lever..... DOWN  
 APPROACH SPEED..... ADJUST  
*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*

GND SPLR..... ARM  
 MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN


ENG MASTERS..... OFF  
 APU MASTER SW..... OFF  
 BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**

PARKING BRK..... ON  
 ATC..... NOTIFY  
 FIRE pushbutton (ENG and APU)..... PUSH  
 AGENTS (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*

- **If Evacuation required:**

EVACUATION..... INITIATE  
 ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*

- **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.*  
*If that causes a strong crosswind, ditch into the wind.*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING

ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*

## ENG DUAL FAILURE - NO FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THRUST LEVERS..... IDLE  
 FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....240 KT/GREEN DOT


*Initially, fly 240 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 700 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE  
 ATC..... NOTIFY

CREW OXY MASKS (Above FL 100).....ON

CABIN AND COCKPIT..... PREPARE  
 SIGNS.....ON

GALLEY..... OFF

USE RUDDER WITH CARE

### ● WHEN BELOW FL 150

RAM AIR..... ON

## COMMON ACTIONS FOR THE APPROACH

### APPROACH PREPARATION

*Note: Final descent slope, when configured (CONF 3; L/G DOWN), will be approximately  
 1.1 N/m per 1 000 ft (with no wind).*

BARO..... SET

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt.*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)
  - When in CONF 3 and VAPP  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - When L/G downlocked  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*  
  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

AT 2 000 FT AGL

CABIN.....NOTIFY FOR LANDING


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

AFTER LANDING

- When the aircraft has stopped :  
PARKING BRK.....ON  
ATC.....NOTIFY
  - If Evacuation required :  
EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - If Evacuation not required :  
CABIN CREW and PASSENGERS (PA).....NOTIFY



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
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- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell*  
*If that causes a strong crosswind, ditch into the wind..*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF

AFTER DITCHING


ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

## ENG RELIGHT (IN FLIGHT)

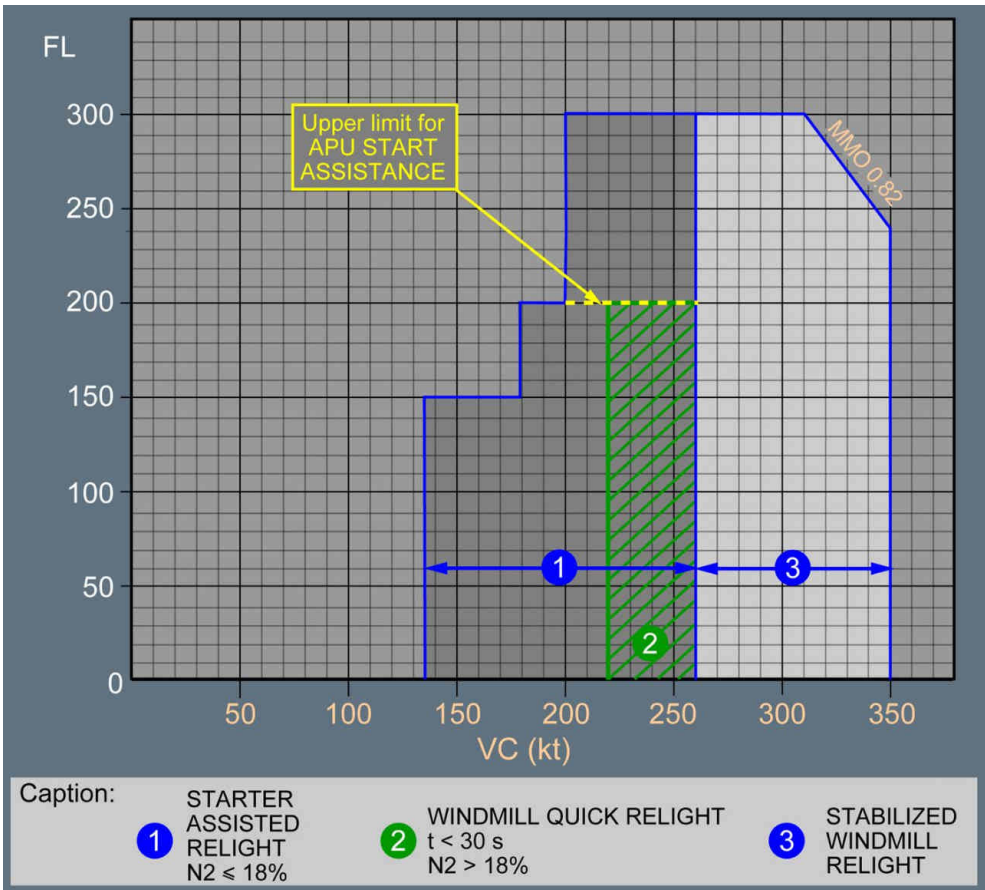
- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.

Engine light up should be achieved within 30 s after fuel flow increases.

- **When idle is reached (AVAIL indication pulses in green) :**
- |                                                                                                       |             |
|-------------------------------------------------------------------------------------------------------|-------------|
| ENG MODE SEL.....                                                                                     | NORM        |
| TCAS MODE SEL  ..... | check TA/RA |
- Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.
- |                   |         |
|-------------------|---------|
| Affected SYS..... | RESTORE |
|-------------------|---------|

- **If no relight :**
- |                            |     |
|----------------------------|-----|
| ENG MASTER (affected)..... | OFF |
|----------------------------|-----|
- Wait 30 s before attempting a new start (to drain the engine).





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
---------	---------------------------------------------------------------------------------------------------------------------------------------------

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM





## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1  $\geq$  5 units, N2  $\geq$  5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	76	74	71	68	64	61	58	54
5	76	74	71	68	64	61	56	52
10	76	74	71	68	64	59	54	
15	76	74	71	67	61	57	52	
20	76	74	69	64	59	54		
25	76	71	66	61	56			
30	73	68	64	59	54			
35	69	65	61	57	52			
40	66	62	59	55				
45	63	60	57					
50	60	57						
55	57							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

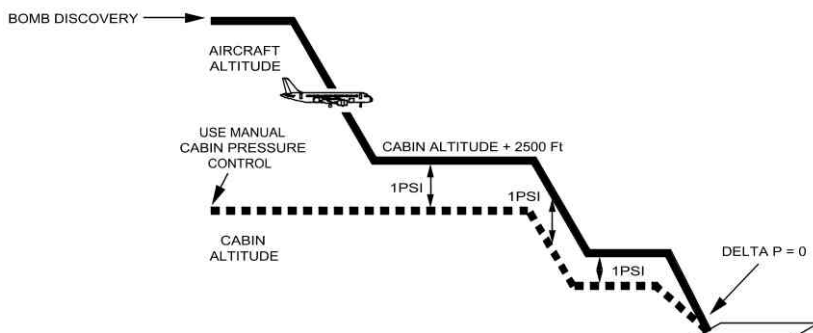
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



## BOMB ON BOARD (Cont'd)

- **When at CAB ALT+2 500 ft:**
  - 1 PSI DELTA P..... MAINTAIN
  - GALLEY..... OFF
  - FLAPS (fuel permitting)..... AT LEAST CONF 1
  - For landing, use normal configuration.*
  - LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**
  - 1 PSI DELTA P..... MAINTAIN
- **During approach:**
  - CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**
    - EVACUATION..... INITIATE
    - Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**
    - CABIN CREW and PASSENGERS (PA)..... NOTIFY

### **CABIN PROCEDURES**

If a suspect device is found in the cabin:

<b>WARNING</b>	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
<b>WARNING</b>	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
<b>CAUTION</b>	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

**EOD PERSONNEL ON BOARD..... CHECK**

*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

**BOMB..... DO NOT OPEN**

**BOMB..... DO NOT CUT WIRES**

**BOMB..... SECURE AGAINST SLIPPING**

**BOMB..... AVOID SHOCKS**

*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

**PASSENGERS..... LEAD AWAY FROM BOMB**

*Move passengers at least 4 seat rows away from the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*

*Seat backs and tray tables must be in their full upright position.*

*Service items may need to be collected in order to secure tray tables.*

**PORTABLE ELECTRONIC DEVICES..... SWITCH OFF**

*The cabin crews must command passengers to switch off all portable electronic devices.*



## BOMB ON BOARD (Cont'd)

### BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

### EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

### GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

#### ● If the bomb can be moved:

#### RH AFT CABIN DOOR SLIDE.....DISARM

#### LEAST RISK BOMB LOCATION (LRBL).....PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

### BOMB INDICATION LINE.....POSITION

Note: *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

### BOMB.....MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

**CAUTION** Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.

### LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

**CAUTION** DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

*Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.*





## BOMB ON BOARD (Cont'd)

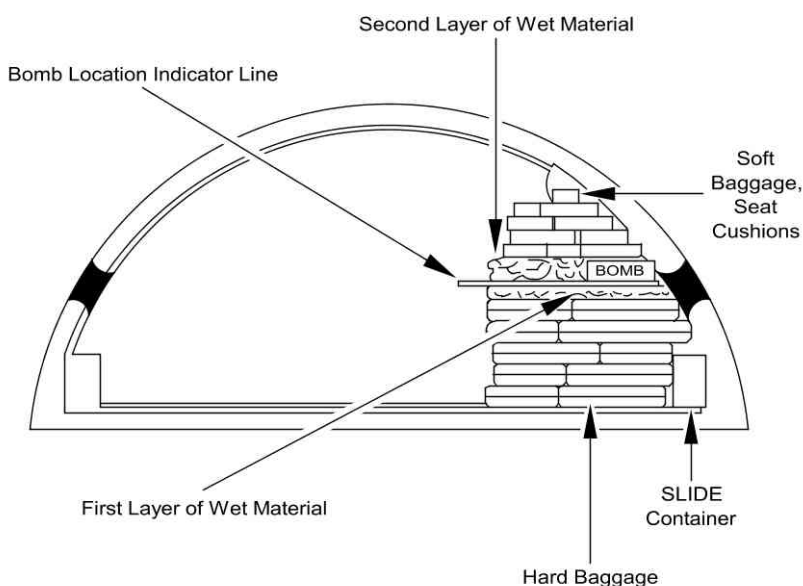
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



### PASSENGERS.....MOVE/ADVISE

*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

### CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*

### EVACUATION/DISEMBARKATION.....EXECUTE

*Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".*

*Use all available airport facilities to disembark without delay.*

## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALLEY.....OFF

LDG ELEV..... SELECT 00

BARO..... SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU)..... DISCH

EVACUATION..... INITIATE





## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### PREPARATION

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CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR..... OFF

SIGNS..... ON

GALLEY..... OFF

LDG ELEV..... SET

BARO..... SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

### APPROACH

RAM AIR..... ON

L/G lever..... DOWN

SLATS AND FLAPS..... MAX AVAIL

GND SPLR..... ARM

MAX BRK PR..... 1 000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

#### ● When aircraft has stopped:

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ If Evacuation required:

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)		
<div>■ If Evacuation not required: CABIN CREW and PASSENGERS (PA)..... NOTIFY</div>		



## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS..... ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*

### WHEN DESCENT ESTABLISHED


EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

#### CAUTION

*Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: *The recommendation is to descend with the autopilot engaged.  
Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: At very high weights, VFE CONF1 is close to VLS clean. To select CONF1, deselect A/THR, decelerate to (or slightly below) VLS and select CONF1 when below VFE. When established at CONF1, the crew can re-engage the A/THR and use managed speed again

LDG DIST.....CHECK  
PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.  
Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown

REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	92	88	82	76	70	65	60	55
15	92	88	82	76	70	65	60	55
20	92	88	82	76	70	65	60	55
25	92	87	80	75	69	64	59	
30	92	85	79	73	68			
35	88	82	76	70	65			
40	85	79	73	68				
45	82	75	70					
50	78	72						
55								



## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note: In case of lack of pitch down authority, reducing thrust may be necessary.

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.

**TAILSTRIKE**

In the event of a tailstrike, apply the following procedure:

**LAND ASAP**

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF



## VOLCANIC ASH ENCOUNTER

● **If the aircraft enters a volcanic ash cloud:**

180 ° TURN..... INITIATE  
ATC..... NOTIFY  
A/THR..... OFF  
THRUST (conditions permitting).....REDUCE  
CREW OXYGEN MASKS.....ON/100 %/EMER  
CABIN CREW.....NOTIFY  
PASSENGER OXYGEN.....AS RQRD  
ENG ANTI ICE..... ON  
WING ANTI ICE..... ON  
ECON FLOW.....OFF

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

APU..... START  
ENGINE PARAMETERS..... MONITOR  
AIRSPEED INDICATIONS.....MONITOR

If airspeed is unreliable or lost, Refer to the QRH ABN 34 Unreliable Speed Indication / ADR Check Proc procedure.

Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.

In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.

To manually depressurize the cabin:

CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... FULL UP

Due to the increased noise level, pay particular attention to visual warnings.

## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

Note: When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● **Before takeoff**

Delay takeoff, or select the most favorable runway.

##### ● **During the takeoff run**

Reject takeoff.

Note: Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● **When airborne**

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ **Before TAKEOFF**

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).





## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note:    - *When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.*  
               - *In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.*

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.


#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note:    1. *If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.*  
               2. *If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.*



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<b>WINDSHEAR (Cont'd)</b>		
<div> <div>■ Airborne, initial climb or landing</div> <div> THR LEVERS AT TOGA.....SET OR CONFIRM  AP (if engaged).....KEEP  SRS ORDERS..... FOLLOW  <i>This includes the use of full backstick, if demanded.</i> </div> <div> <u>Note:</u> <ol style="list-style-type: none"> <li>1. If engaged, the autopilot disengages when <math>\alpha</math> is greater than <math>\alpha</math> prot.</li> <li>2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.</li> </ol> </div> <div>DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.</div> <div>CLOSELY MONITOR FLIGHT PATH AND SPEED.</div> <div>RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.</div> </div>		

WINDSHIELD/WINDOW ARCING

Affected WINDOW/WINDSHIELD ANTI ICE C/B..... PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)

## WINDSHIELD/WINDOW CRACKED

**DIAGNOSIS OF INNER PLY.....PERFORM**  
*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

**MAX FL..... 230/MEA**

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note:    *The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.*

**CAB PRESS MODE SEL..... MAN**

**MAN V/S CTL..... AS RQRD**

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


**CAB PRESS MODE SEL..... AUTO**

Note:    *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

**CAB PRESS MODE SEL..... MAN**

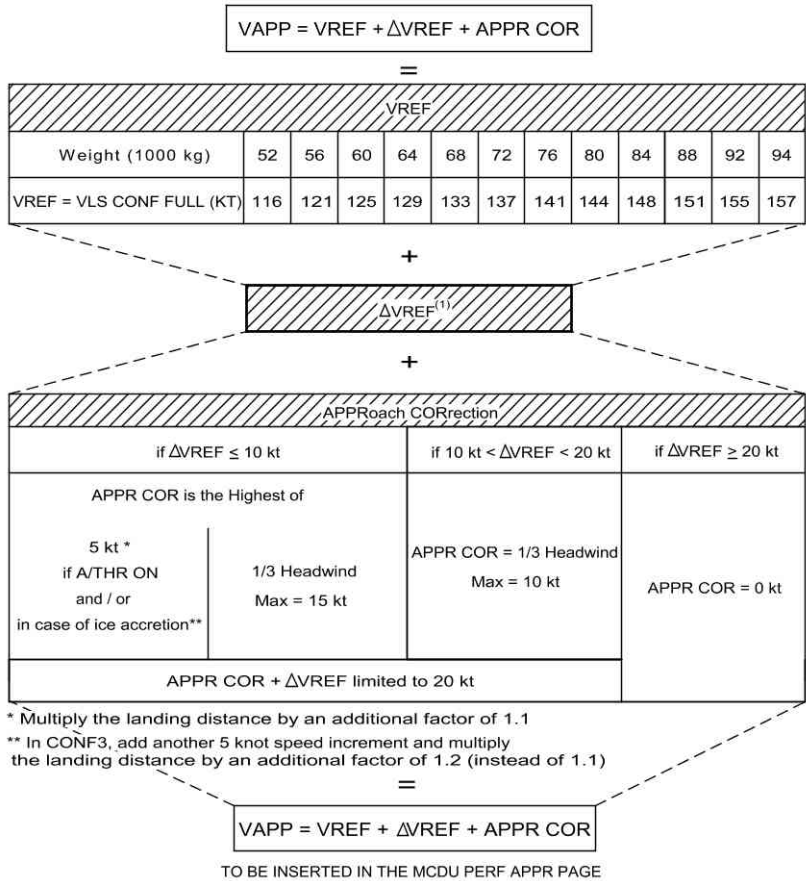
**MAN V/S CTL..... FULL UP**

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>				
<b>SYSTEM</b>	<b>CONDITIONS</b>	<b>RECOMMENDED ACTION</b>		
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)		
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control		
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control		
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.		
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>		
	Fuel temp greater than 45 °C in wing tank	GALLEY (OFF)		
	Fuel temp lower than -40 °C in wing tank	Consider descending to a lower altitude, and/or increasing Mach to increase TAT.		
APU	EGT > EGT MAX -33 °C (inhibited during APU start)			
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.		
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"><li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li><li>- If oil pressure is below 60 PSI (red indication), without the <b>ENG</b> OIL LO PR warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li></ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.		
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.		
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <i>Note: If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended: 1. <i>Low Speed-</i> Increase engine speed to increase fuel flow, and thereby cool IDG oil. 2. <i>High Speed-</i> Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.		
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.		
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.		
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).		

# VAPP CALCULATION

## VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



(1) Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables

### EXAMPLE OF VAPP CALCULATION:

- Failure

:

ALTN LAW
- Flight Conditions

:

Autothrust ON, ice accretion
- Landing Configuration

:

CONF 3
- Headwind

:

12 kt
- Landing Weight/CG

:

60 t
- VREF determined from the landing weight

:

125 kt
- VREF correction due to the failure (ΔVREF)

:


10 kt

As ΔVREF is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- 5+5 = 10 kt (ice accretion and landing in CONF 3)
- 1/3 Headwind = 12 kt/3 = 4 kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

VAPP = VREF + ΔVREF + APPR CORR = 125 + 10 + 10 = 145 kt

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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors** “WITHOUT REV” when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors** “WITH REV” when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:     *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways /A/THR ON / No wind / WITHOUT REV. / Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.60
	3	6			1.75
RESULT	3	10			1.40x1.75x1.1=2.70

VREF = 131 kt. Therefore  $VAPP = 131 + 10 + 5 = 146$  kt..

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FAILURES	Flaps Lever Position for Landing	$\Delta$ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S $\geq$ 1)	3	30			1.95*
RESULT	3	30			1.95

VREF = 140 kt. Therefore VAPP = 140+30 = 170 kt.






**LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY**

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.50	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.75 2.75	2.75 2.75
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.80 2.00	N/A N/A
	EMER ELEC CONF	3	10	2.75	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	30	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.25*
	S>3	3	5	1.25*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.55	1.45 1.55
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.35 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.65	1.35 1.50
	SEC 1+2+3 FAULT	3	10	1.65	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.25*



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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.45	1.30 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	GREEN + BLUE	3	25	1.85	1.75
	GREEN + YELLOW	3	30	2.50	N/A
	BLUE + YELLOW	3	10	1.70	1.65
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.60 1.75	1.50 1.60
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.30 1.45
	IR 1+2+3 FAULT	3	10	2.45	2.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.25*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.30*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.



**LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY**

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.35	1.15 1.25
	DC EMER CONF	FULL 3	- 6	2.20 2.20	2.20 2.20
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	N/A N/A
	EMER ELEC CONF	3	10	2.20	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.85*
	FLAPS<1				
	S<1	3	45	2.00*	1.75*
	S≥1	3	30	1.70*	1.50*
	1≤FLAPS<2				
	S<1	3	30	1.70*	1.50*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.55*	1.40*
	1≤S≤3	3	10	1.30*	1.20*
	S>3	3	5	1.20*	1.10*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.25*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.40 1.55	1.25 1.35
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.20*



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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.15 1.30
	GREEN + BLUE	3	25	1.95	1.80
	GREEN + YELLOW	3	30	2.05	N/A
	BLUE + YELLOW	3	10	1.80	1.70
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL	10	1.25	1.15
	if there is ice accretion	3	16	1.35	1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.20
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
NAV	IR 1+2+3 FAULT	3	10	1.75	1.75
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.35*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.30*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.30*	1.75* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.


<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)



**LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY**

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.15 1.25
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.90 1.95
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	N/A N/A
	EMER ELEC CONF	3	10	1.95	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.75*
	FLAPS < 1				
	S<1	3	45	2.00*	1.65*
	S≥1	3	30	1.70*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.60*	1.35*
	S≥1	3	15	1.40*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.50*	1.30*
	S≥1	3	10	1.30*	1.10*
	FLAPS=3				
	S<1	3	25	1.45*	1.25*
	1≤S≤3	3	10	1.25*	1.05*
	S>3	3	5	1.15*	1.00*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.10*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.30 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.25
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.15
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.25*	1.05*



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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.10 1.20
	GREEN+BLUE	3	25	1.80	1.65
	GREEN + YELLOW	3	30	2.00	N/A
	BLUE + YELLOW	3	10	1.75	1.55
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	IR 1+2+3 FAULT	3	10	1.35	1.35
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.30*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.25*	1.05*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15
	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.25*	1.70* 1.15*
ENG	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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### COMPUTER RESET

When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor.

The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>
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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
22	AUTO FLT FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <b>On ground:</b> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G01 on 49VU, M06 on 121VU. G02 on 49VU, M07 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: M06, M07, G01, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M07 on 121VU.</li> </ul> </li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M06 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M07, G02</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP* in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<b>On ground, or in flight</b> <ul style="list-style-type: none"> <li>- Set ELAC 1(2) pb to OFF</li> <li>- Wait 3 s,</li> <li>- Set ELAC 1(2) pb to ON</li> </ul> <div> <div><b>CAUTION</b></div> <div>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</div> </div> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<div> <div><b>WARNING</b></div> <div>Do not reset more than one computer at a time.</div> </div> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>
	ELAC or SEC malfunction	ELAC or SEC	<div> <div><b>WARNING</b></div> <div>           Do not reset more than one computer at a time.           <ul style="list-style-type: none"> <li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li> </ul> </div> </div> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li> <li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li> </ul>
28	Loss of fuel quantity indication	FQIC	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/B of the affected channel:               <ul style="list-style-type: none"> <li>• Channel 1 (A13 on 49VU)</li> <li>• Channel 2 (M27 on 121VU)</li> </ul> </li> <li>- Wait 5 s, before pushing the C/B.</li> </ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>
31	FWS FWC 1(2) FAULT	FWC	<b>On ground:</b> Pull, then push, the C/B of the affected FWC: <ul style="list-style-type: none"> <li>- FWC 1 (F01 on 49VU)</li> <li>- FWC 2.(Q7 on 121VU)</li> </ul> Wait 50 s after pushing the C/Bs. <b>In flight:</b> Pull, then push, the C/B of the affected FWC: <ul style="list-style-type: none"> <li>- FWC 1 (F01 on 49VU)</li> <li>- FWC 2 (Q7 on 121VU)</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><b>Note:</b> After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><b>Note:</b> After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><b>Note:</b> After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1: <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2: <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>
34	<u>NAV</u> TCAS FAULT	TCAS	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
46	ATSU Malfunction	ATSU	<p>An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.</p> <p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollback	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits:
  - AUTOLAND (HWC30 / TWC10 / XWC20)
  - MANUAL LAND (HWC40 / TWC10 / XWC25)
  - OEI ROLLOUT (IDLE REV ONLY XWC15)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
<b>BEFORE TAKEOFF Checklist</b>	



## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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## LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.  
When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

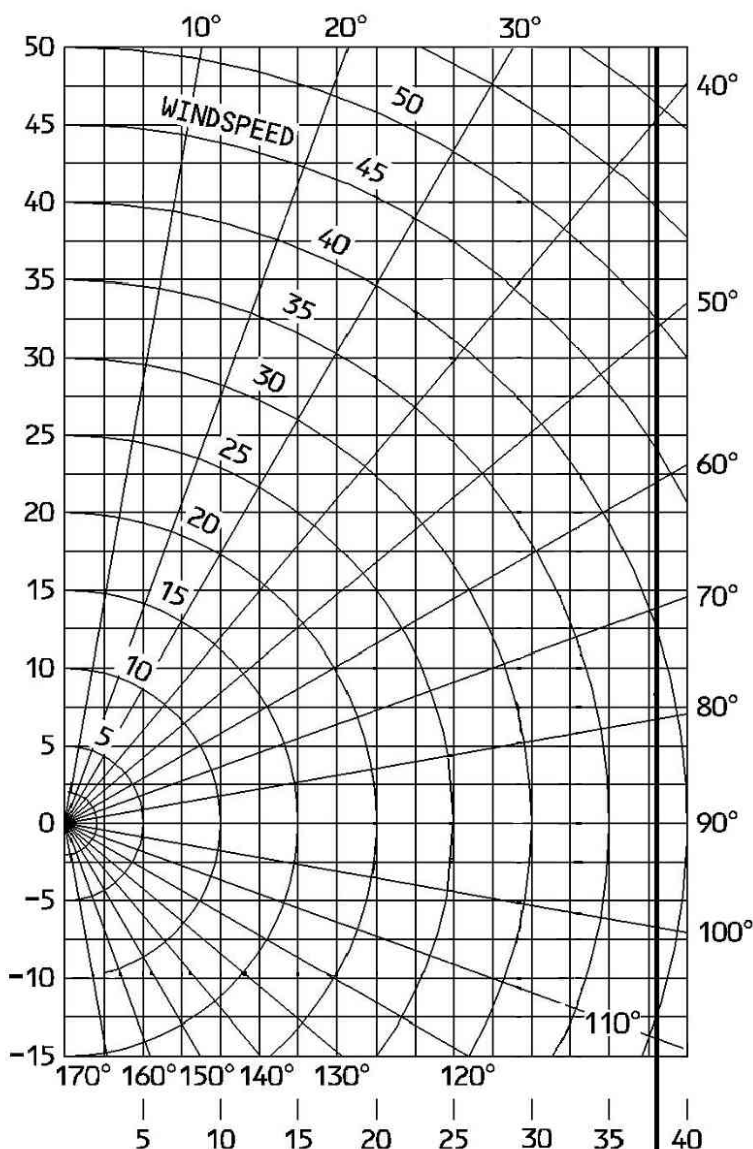
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A321



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
 JFO 500' / 2000m 15 knots x-wind  
 FO ≥ CAT I 20 knots x-wind

**CAT II Autoland**  
 30 knots headwind  
 20 knots x-wind  
 10 knots tailwind  
 15 knot x-wind limit  
 for OEI Rollout with  
 IDLE reverse only.

**CAT II No Autoland**  
 40 knots headwind  
 25 knots x-wind  
 10 knots tailwind

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## ACARS LANDING FAIL CODE - A321

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02	
			S ≥ 1	03	NAV	IR 1+2+3 FAULT		01
	1 ≤ FLAPS < 2	S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02		
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	03	
	2 ≤ FLAPS < 3	S < 1	06	BLEED			DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion	
			S ≥ 1		07			
	FLAP = 3	S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	09			REV UNLOCK with buffet (CONF 3)		02
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
		FLAP > 3	S < 1	11				
			1 ≤ S ≤ 3	12				
			S > 3	13				
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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**SPEEDS**

OPERATING SPEEDS (KT)					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
52	130	168	188	121	116
56	135	174	194	125	121
60	140	180	200	130	125
64	144	186	206	134	129
68	149	192	212	138	133
72	153	197	218	142	137
76	157	203	224	146	141
80	161	208	230	150	144
84	165	213	236	154	148
88	169	218	242	157	151
92	173	223	248	161	155
94	175	226	251	163	157

<sup>(1)</sup> Above FL 200 add 1 kt per additional 1 000 ft.

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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

W(1000Kg)	52	56	60	64	68	72	76	80	84	88	92	94
VLS CONF FULL (KT)	116	121	125	129	133	137	141	144	148	151	155	157
VLS CONF 3 (KT)	121	125	130	134	138	142	146	150	154	157	161	163

+

CORRECTION

5KT <sup>(1)</sup>	<div style="border-left: 1px solid black; padding-left: 10px;"> 1/3 HEADWIND (EXCLUDING GUST) MAX=15KT </div>
WHICHEVER IS HIGHER	

=

VAPP

$V_{APP}^{(2)} = \text{MAX}(VLS + 5Kt^{(1)}; VLS + W_{IND} \text{ CORR})$

1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
  2. In case of ice accretion, Vapp must not be lower than:
    - VLS + 5 kt in CONF FULL
    - VLS + 10 kt in CONF 3
- In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		860	900	940	980	1020	1070	1150	1370	1470	1570
	WET		1110	1180	1250	1330	1400	1470	1540	1670	1770	1860
	COVERED WITH	STANDING WATER	1550	1660	1760	1880	1990	2080	2200	2310	2420	2520
		SLUSH	1490	1580	1670	1770	1870	1980	2070	2170	2280	2370
		COMPACTED SNOW	1390	1460	1530	1600	1670	1730	1790	1850	1920	1980
		ICE	2780	2910	3050	3190	3310	3440	3560	3700	3830	3950
CORRECTION ON ACTUAL LANDING DISTANCE												
RUNWAY CONDITION	dry runway	wet runway	runway covered with									
			standing water	slush	compacted snow		ice					
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %		+5 %					
per 10 kt headwind	No correction for headwind due to wind correction on approach speed											
per 10 kt tailwind	+16 %	+21 %	+22 %	+21 %	+16 %		+26 %					
2 reversers operative	-5 %	-8 %	-17 %	-16 %	-11 %		-29 %					
Per 5 kt speed increment (and no failure) add 8 % (all runways)												

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 74 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 1 020 m

Read from the Corrections table,  
Pressure altitude correction: 3 × 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt no reversers) = 1020 × 1.06 × 1.08 = 1 170 m.

## LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		820	850	890	930	970	1020	1080	1290	1380	1470
	WET		1040	1100	1160	1230	1290	1360	1430	1540	1640	1720
	COVERED WITH	STANDING WATER	1430	1530	1640	1740	1840	1940	2030	2140	2240	2340
		SLUSH	1390	1470	1560	1640	1730	1820	1920	2020	2120	2210
		COMPACTED SNOW	1310	1380	1440	1510	1570	1630	1680	1750	1810	1860
		ICE	2590	2720	2850	2970	3090	3210	3320	3450	3580	3690

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+4 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+16 %	+21 %	+24 %	+22 %	+16 %	+27 %
2 reversers operative	-4 %	-8 %	-16 %	-15 %	-11 %	-28 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW =74 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 970 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 970 × 1.06 × 1.08 = 1 120 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		MODE	54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND
RUNWAY CONDITION												
DRY		MED LOW	1340 1920	1440 2100	1550 2290	1650 2460	1810 2640	1970 2810	+5 +3	0 0	+13 +15	-2 -2
WET		MED LOW	1410 1920	1540 2100	1690 2290	1830 2460	2010 2640	2200 2810	+6 +3	-3 0	+17 +15	-3 -2
COVERED WITH	STANDING WATER	MED LOW	1770 1900	1990 2090	2210 2300	2410 2490	2640 2720	2860 2940	+6 +4	-17 0	+21 +18	-4 -2
		SLUSH	MED LOW	1700 1860	1890 2030	2100 2220	2290 2400	2490 2590	2690 2790	+7 +5	-16 0	+21 +17
	COMPACTED SNOW		MED LOW	1580 1870	1700 2050	1830 2230	1940 2390	2060 2560	2170 2730	+6 +4	-12 0	+15 +15
		ICE	MED LOW	2980 3000	3240 3260	3530 3550	3780 3800	4040 4060	4290 4320	+6 +5	-29 -26	+25 +26

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	
RUNWAY CONDITION	MODE											
DRY		MED	1280	1370	1460	1530	1660	1800	+3	0	+13	-1
		LOW	1830	1990	2150	2300	2450	2590	+3	0	+14	-2
WET		MED	1330	1440	1560	1670	1820	1980	+4	-2	+16	-2
		LOW	1830	1990	2150	2300	2450	2590	+3	0	+14	-2
COVERED WITH	STANDING WATER	MED	1660	1830	2020	2190	2400	2580	+4	-16	+20	-3
		LOW	1810	1980	2150	2310	2490	2660	+4	0	+18	-2
	SLUSH	MED	1590	1760	1940	2080	2270	2440	+5	-16	+20	-3
		LOW	1770	1930	2080	2220	2380	2540	+5	0	+16	-2
	COMPACTED SNOW	MED	1500	1600	1710	1800	1890	1970	+4	-11	+14	-2
		LOW	1780	1940	2090	2230	2380	2520	+4	0	+14	-2
	ICE	MED	2790	3030	3270	3490	3720	3940	+5	-28	+25	-4
		LOW	2810	3050	3290	3510	3740	3960	+5	-26	+26	-4

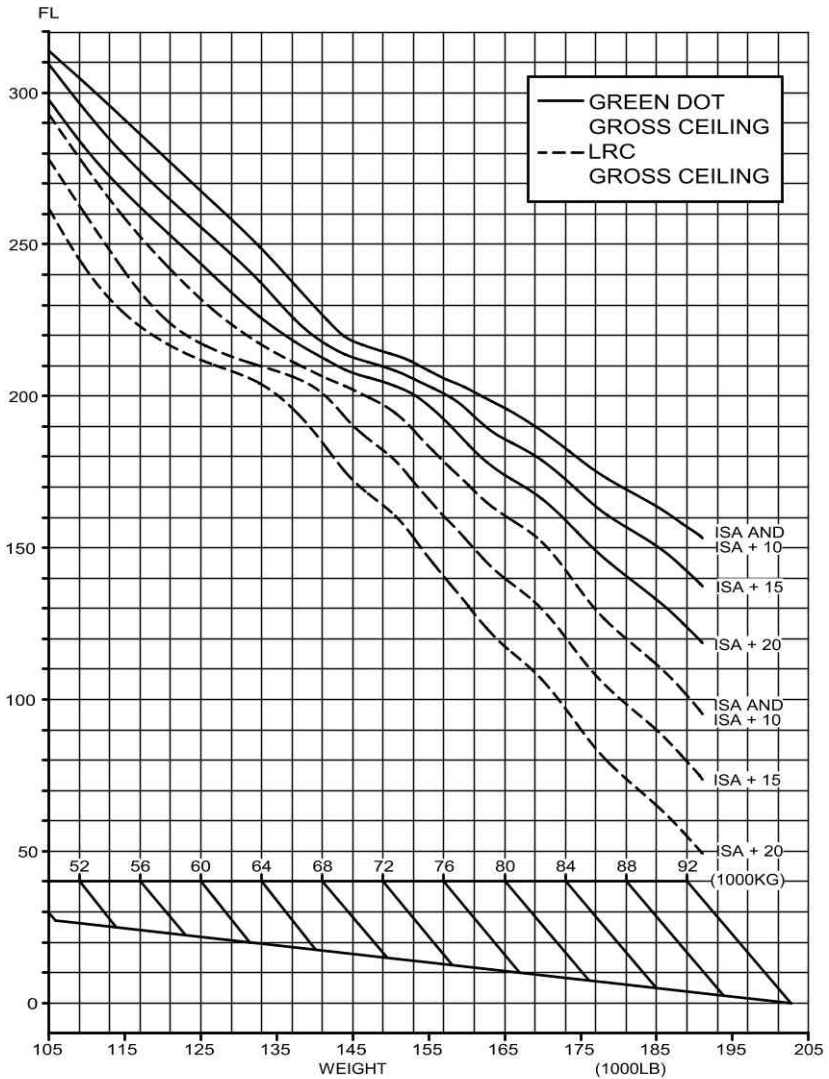
Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).



## CEILINGS

### ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA	ISA + 10	ISA + 15	ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-1 300 ft	-1 400 ft	-1 400 ft
	TOTAL ANTI ICE ON	-2 800 ft	-2 800 ft	-2 800 ft	-3 000 ft
GREEN DOT	ENGINE ANTI ICE ON	-1 000 ft	-1 000 ft	-1 100 ft	-1 200 ft
	TOTAL ANTI ICE ON	-2 100 ft	-2 100 ft	-2 300 ft	-2 500 ft

Note: For weights 85 000 kg or 187 400 lb, one engine ceilings at Long Range speed may be overestimated by FMS Legacy. In this case, ceiling values provided in the above graph should be retained.

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## GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

### ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		DISTANCE (NM) INITIAL SPEED (KT)		TIME (MIN) FUEL(1000KG)
			LEVEL OFF (FT)				
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL						
	250	290	310	330	350	370	390
50				174 32 198 .9 31700	228 42 200 1.1 31800	262 47 202 1.3 31900	288 52 204 1.3 31900
54			156 29 202 .9 30100	222 41 204 1.2 30200	258 47 206 1.4 30300	285 52 208 1.5 30300	308 55 210 1.5 30400
58		152 29 206 .9 28200	231 43 208 1.3 28500	269 50 210 1.5 28600	298 54 212 1.7 28600	320 58 214 1.7 28700	339 61 216 1.8 28700
62		236 45 212 1.5 26400	279 52 214 1.7 26600	309 57 216 1.8 26600	333 61 218 1.9 26700	352 64 220 2.0 26700	369 67 222 2.1 26800
66	155 30 214 1.1 24200	281 53 218 1.8 24600	314 59 220 2.0 24600	339 63 222 2.1 24700	360 67 224 2.2 24700	378 69 226 2.3 24800	393 71 228 2.3 24800
70	231 45 220 1.7 22600	311 59 224 2.1 22800	335 63 226 2.2 22800	357 67 228 2.3 22900	376 70 230 2.4 22900	392 72 232 2.5 22900	406 74 234 2.5 23000
74	214 41 226 1.6 21300	278 53 230 2.0 21400	301 56 232 2.1 21400	321 60 234 2.2 21500	339 62 236 2.2 21500	354 65 238 2.3 21500	
78	212 40 232 1.6 20500	264 49 236 1.9 20600	283 52 238 2.0 20600	301 55 240 2.1 20600	316 57 242 2.2 20600	330 60 244 2.2 20600	
82	242 46 238 1.9 19600	282 52 242 2.1 19700	298 55 244 2.2 19700	313 57 246 2.3 19700	326 59 248 2.3 19800		
86	278 52 244 2.3 18400	317 58 248 2.5 18400	332 61 250 2.6 18500	346 63 252 2.6 18500	359 65 254 2.7 18500		
90	300 56 250 2.6 17100	335 61 254 2.7 17200	349 64 256 2.8 17200	363 66 258 2.9 17200			
94	317 59 256 2.8 15900	350 64 260 3.0 15900	363 66 262 3.0 16000	375 67 264 3.1 16000			
CORRECTIONS		DISTANCE		TIME	FUEL	LEVEL OFF	
ENGINE ANTI ICE ON		+ 15 %		+ 12 %	+ 18 %	- 200 FT	
TOTAL ANTI ICE ON		+ 20 %		+ 24 %	+ 33 %	- 700 FT	

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## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)		MACH IAS (KT)	
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.181 .442	1.250 .480	1.319 .507	1.369 .530	1.417 .549	1.472 .571	
	1972 244	1915 241	1856 236	1874 237	1870 236	1875 236	
<b>54</b>	1.199 .454	1.281 .494	1.363 .529	1.411 .548	1.464 .569	1.520 .588	
	2093 251	2047 249	2029 246	2028 246	2032 245	2034 243	
<b>58</b>	1.223 .466	1.310 .506	1.402 .546	1.454 .567	1.510 .587	1.554 .591	
	2224 258	2174 255	2185 255	2190 254	2196 253	2138 244	
<b>62</b>	1.253 .484	1.344 .521	1.441 .562	1.497 .583	1.536 .585	1.568 .551	
	2387 268	2330 263	2343 262	2354 262	2277 252	2121 227	
<b>66</b>	1.278 .495	1.380 .538	1.480 .578	1.534 .595	1.548 .548		
	2519 274	2499 272	2504 270	2503 267	2252 235		
<b>70</b>	1.303 .506	1.412 .552	1.517 .591	1.547 .578			
	2651 280	2651 278	2667 277	2519 260			
<b>74</b>	1.327 .515	1.446 .567	1.549 .600	1.562 .528			
	2785 286	2818 286	2811 281	2482 236			
<b>78</b>	1.359 .531	1.478 .579	1.557 .577				
	2968 295	2979 293	2795 270				
<b>82</b>	1.385 .543	1.510 .592	1.574 .523				
	3124 301	3146 299	2758 243				
<b>86</b>	1.412 .554	1.519 .580					
	3282 308	3163 293					
<b>90</b>	1.440 .567	1.529 .559					
	3449 315	3158 282					
<b>94</b>	1.456 .569	1.549 .512					
	3540 316	3139 258					
ENGINE ANTI ICE ON $\Delta$ FUEL = + 2 %				TOTAL ANTI ICE ON $\Delta$ FUEL = + 4 %			



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## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
							TIME (H.MIN)		
AIR DIST.  (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1510 0.46	1317 0.44	1180 0.42	1131 0.41	1083 0.41	1061 0.41	9	7	6
300	2259 1.06	2008 1.03	1826 0.59	1762 0.58	1699 0.57	1670 0.58	15	14	13
400	3004 1.27	2694 1.22	2468 1.17	2388 1.15	2312 1.14	2276 1.15	21	20	20
500	3745 1.47	3377 1.41	3106 1.34	3010 1.32	2921 1.31	2877 1.32	27	27	27
600	4481 2.08	4055 2.00	3739 1.52	3628 1.49	3527 1.48	3475 1.49	34	34	34
700	5212 2.28	4729 2.19	4369 2.10	4241 2.07	4129 2.04	4069 2.05	40	40	41
800	5938 2.49	5400 2.39	4994 2.28	4851 2.24	4727 2.21	4659 2.22	46	47	48
900	6659 3.10	6066 2.58	5615 2.46	5456 2.41	5320 2.38	5247 2.38	52	53	54
1000	7376 3.31	6728 3.17	6232 3.04	6058 2.59	5907 2.55	5831 2.55	58	60	61
1100	8088 3.52	7387 3.37	6845 3.22	6656 3.16	6490 3.12	6413 3.11	63	66	68
1200	8798 4.13	8042 3.56	7454 3.41	7250 3.34	7070 3.29	6991 3.28	69	73	74
1300	9506 4.34	8693 4.16	8059 3.59	7840 3.52	7645 3.46	7566 3.44	75	79	81
1400	10209 4.55	9340 4.36	8661 4.17	8427 4.10	8217 4.03	8137 4.00	81	86	87
ENGINE ANTI ICE ON △FUEL = + 2 %					TOTAL ANTI ICE ON △FUEL = + 4 %				

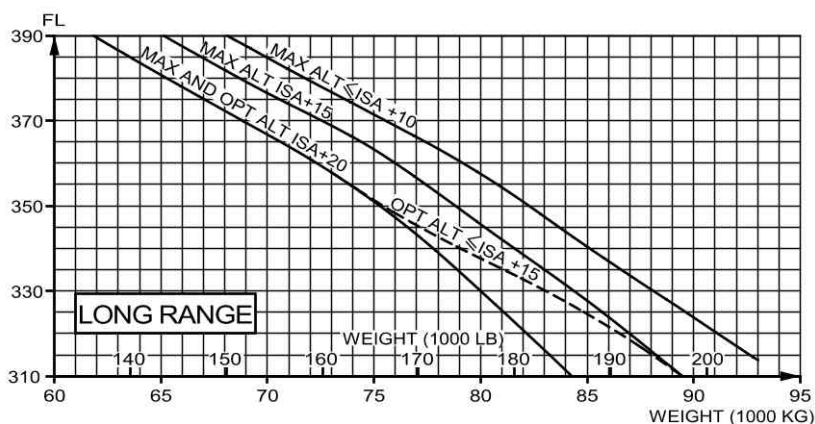
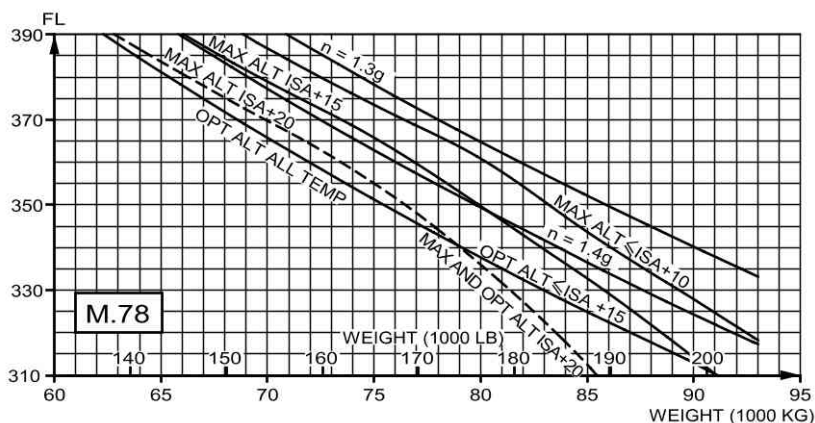
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## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 500 ft Opt ALT : - 300 ft	Max ALT : -1 100 ft Opt ALT : - 300 ft
ISA +15	Max ALT : - 700 ft Opt ALT : - 300 ft	Max ALT : -1 500 ft Opt ALT : - 600 ft
ISA +20	Max ALT : -1 000 ft Opt ALT : -1 000 ft	Max ALT : -2 300 ft Opt ALT : -2 300 ft

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## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

### ALL ENGINES

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 – DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 65000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	1037 0.36	978 0.36	926 0.36	880 0.36	842 0.36	816 0.36	1	2	4
400	2281 1.02	2158 1.02	2049 1.02	1956 1.03	1885 1.03	1854 1.03	7	10	20
600	3518 1.27	3329 1.28	3164 1.29	3023 1.29	2918 1.30	2875 1.30	13	18	33
800	4747 1.53	4494 1.54	4271 1.55	4081 1.56	3939 1.56	3882 1.56	19	25	45
1000	5970 2.19	5650 2.20	5370 2.22	5131 2.23	4951 2.23	4874 2.23	25	33	57
1200	7185 2.45	6799 2.47	6461 2.48	6171 2.49	5952 2.50	5852 2.50	31	40	67
1400	8393 3.11	7941 3.13	7544 3.14	7204 3.16	6944 3.17	6816 3.17	36	47	77
1600	9596 3.37	9076 3.39	8620 3.41	8228 3.43	7925 3.44	7768 3.44	41	54	86
1800	10792 4.03	10205 4.05	9689 4.07	9244 4.09	8898 4.10	8707 4.10	46	60	94
2000	11983 4.29	11327 4.31	10751 4.34	10254 4.36	9865 4.37	9640 4.37	51	66	102
2200	13167 4.55	12442 4.58	11806 5.00	11256 5.03	10825 5.04	10566 5.04	56	73	110
2400	14345 5.21	13551 5.24	12855 5.26	12251 5.29	11776 5.31	11482 5.31	61	79	117
2600	15518 5.47	14654 5.50	13897 5.53	13239 5.56	12720 5.58	12388 5.58	65	85	125
2800	16685 6.13	15750 6.16	14932 6.19	14220 6.23	13657 6.24	13286 6.24	68	90	131
3000	17851 6.39	16841 6.42	15961 6.46	15195 6.49	14586 6.51	14175 6.51	72	96	138
ECON AIR CONDITIONING △FUEL = - 0.6 %			ENGINE ANTI ICE ON △FUEL = + 2 %			TOTAL ANTI ICE ON △FUEL = + 5 %			

FLIP22B A321-131 IAE V2530-A53610 03301.300211 0250300 .7800 .000200 140 0300350 65 0 100100 40100 18590

CL-N0-CL-004-009-1E0

## COST INDEX FOR LONG RANGE CRUISE SPEED

### ALL ENGINES

For a quick determination of the  $CI_{LRC}$ , use:

-  $CI_{LRC}$  = 50 kg/min in the FMGC.

or

-  $CI_{LRC}$  = 70 (100 lb/h) in the FMGC.

## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)	60				80				IAS (KT)
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.7	173	100	IDLE					241
370	15.9	166	95	IDLE	18.0	186	108	IDLE	252
350	15.2	159	90	IDLE	17.3	179	103	IDLE	264
330	14.6	153	85	IDLE	16.6	173	98	IDLE	277
310	14.0	148	81	IDLE	16.0	167	93	IDLE	289
290	13.5	143	76	IDLE	15.3	161	88	IDLE	300
270	12.8	137	71	IDLE	14.5	154	81	IDLE	300
250	12.1	131	66	IDLE	13.6	146	75	IDLE	300
240	11.7	127	63	IDLE	13.2	143	72	IDLE	300
220	11.0	121	58	IDLE	12.3	135	66	IDLE	300
200	10.2	114	53	IDLE	11.5	127	60	IDLE	300
180	9.5	108	48	IDLE	10.5	119	54	IDLE	300
160	8.7	100	43	IDLE	9.6	110	48	IDLE	300
140	7.9	93	39	IDLE	8.7	101	42	IDLE	300
120	7.1	85	34	IDLE	7.7	92	37	IDLE	300
100	6.3	76	29	IDLE	6.7	81	31	IDLE	300
50	2.4	30	10	IDLE	2.5	32	11	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		ECON AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		—		+ 1 min		+ 3 min		+ 0.2 %	
FUEL		— 2 %		+ 17 %		+ 90 %		+ 0.7 %	
DISTANCE		—		+ 4 %		+ 20 %		+ 0.4 %	

10B-08FA321-131IAEV2530-A523100000C5KG330001859000-1-350.015.0.00003.780300.000250.0000 FCOM-NO-03-05-30-002-150

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## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 120 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 100 KG (4MIN)									
REF. LDG WT AT DEST. = 60000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %		TIME (H.MIN)			
ANTI-ICING OFF									
AIR DIST. (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	601 0.12						2		
60	775 0.16						4		
80	950 0.20	898 0.19					5		
100	1124 0.23	1056 0.23	1035 0.22				6	6	
120	1299 0.27	1213 0.26	1172 0.26	1172 0.25			7	7	
140	1474 0.31	1371 0.30	1310 0.29	1294 0.28			8	8	
160	1649 0.35	1529 0.33	1447 0.32	1416 0.31	1423 0.31		9	8	10
180	1825 0.39	1687 0.37	1585 0.35	1539 0.35	1536 0.34	1547 0.33	10	9	12
200	2000 0.43	1845 0.40	1723 0.38	1662 0.38	1650 0.36	1654 0.36	11	10	13
220	2176 0.46	2003 0.44	1860 0.42	1784 0.41	1763 0.39	1761 0.39	12	10	14
240	2352 0.50	2161 0.47	1998 0.45	1907 0.44	1877 0.42	1869 0.41	13	11	15
260	2529 0.54	2320 0.50	2136 0.48	2030 0.47	1991 0.45	1976 0.44	15	12	16
280	2705 0.58	2479 0.54	2274 0.51	2153 0.50	2105 0.48	2084 0.47	16	13	17
300	2882 1.02	2638 0.57	2413 0.54	2277 0.53	2220 0.51	2192 0.50	17	13	18
320	3059 1.05	2797 1.01	2551 0.58	2400 0.57	2334 0.54	2300 0.53	18	14	20
340	3236 1.09	2956 1.04	2689 1.01	2524 1.00	2449 0.57	2408 0.55	19	15	21
360	3414 1.13	3115 1.07	2828 1.04	2647 1.03	2563 1.00	2516 0.58	20	16	22
380	3591 1.17	3275 1.11	2966 1.07	2771 1.06	2678 1.03	2625 1.01	21	16	23
400	3769 1.21	3435 1.14	3105 1.10	2895 1.09	2793 1.06	2733 1.04	22	17	24
420	3947 1.24	3594 1.18	3243 1.14	3019 1.12	2908 1.09	2842 1.06	23	18	25
440	4125 1.28	3754 1.21	3382 1.17	3143 1.15	3023 1.12	2951 1.09	25	19	26
460	4304 1.32	3915 1.24	3521 1.20	3267 1.18	3138 1.15	3060 1.12	26	20	27
480	4482 1.35	4075 1.28	3660 1.23	3392 1.21	3253 1.18	3169 1.15	27	20	28
500	4661 1.39	4235 1.31	3799 1.26	3516 1.25	3369 1.21	3278 1.18	28	21	30
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
△FUEL = - 1 %			△FUEL = + 4 %			△FUEL = + 6 %			

CL-W0-04-13-155



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## IN CRUISE QUICK CHECK FL 100 LONG RANGE

### FLIGHT WITHOUT CAB PRESS

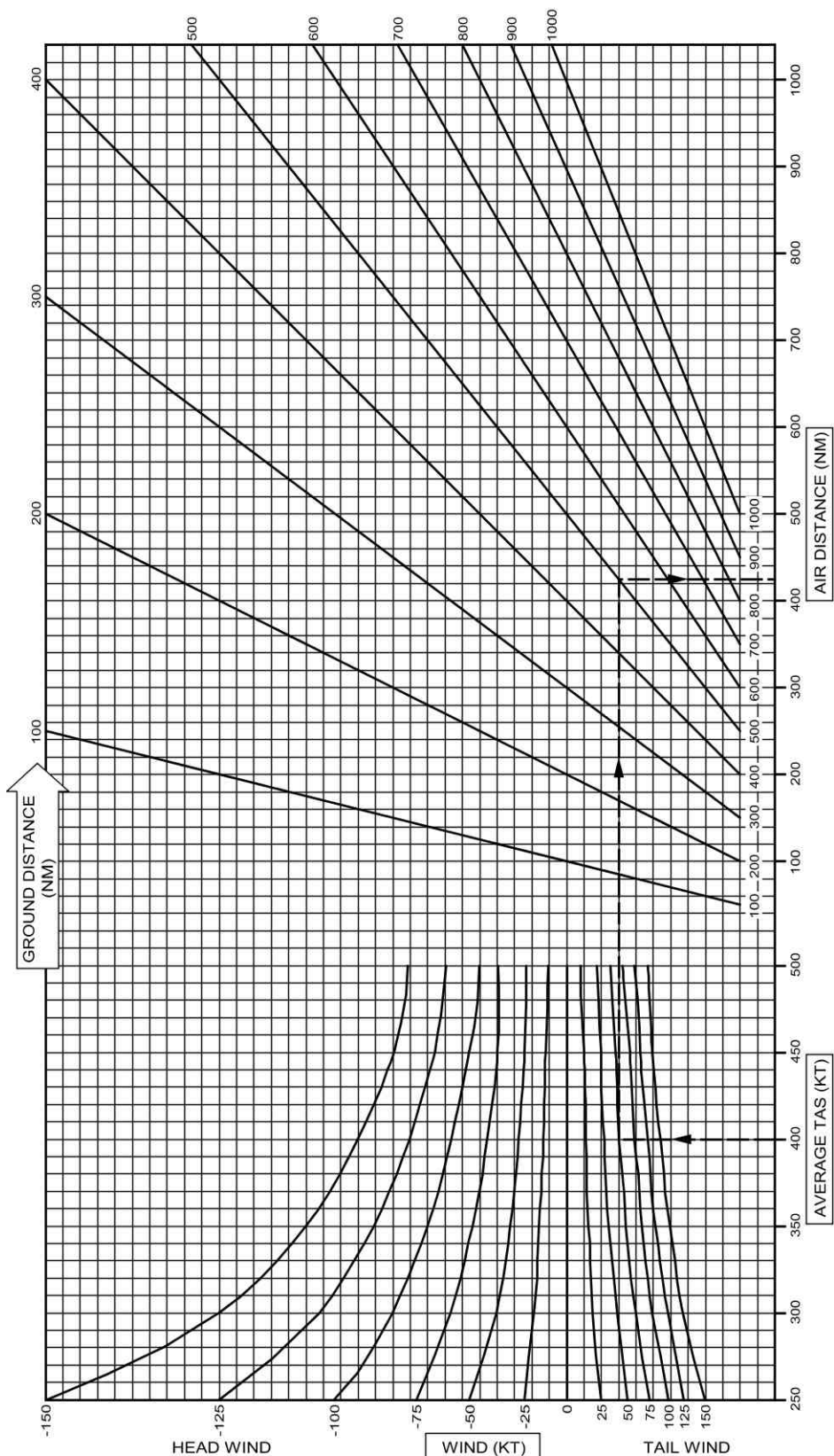
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 140 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING		ISA		FUEL CONSUMED (KG)			
ANTI-ICING OFF		CG = 25.0%		TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	65	70	75	80	85	90	95
40	337 0.15	339 0.15	342 0.15	347 0.15	353 0.15	361 0.15	370 0.15
60	515 0.18	523 0.18	531 0.18	540 0.18	551 0.18	561 0.18	571 0.18
80	693 0.22	706 0.22	719 0.21	733 0.21	748 0.21	761 0.21	773 0.21
100	871 0.26	890 0.25	908 0.25	926 0.24	945 0.24	960 0.24	975 0.24
120	1048 0.30	1073 0.29	1096 0.28	1119 0.28	1141 0.27	1160 0.27	1176 0.27
140	1226 0.33	1256 0.32	1284 0.31	1312 0.31	1338 0.30	1359 0.30	1378 0.30
160	1403 0.37	1438 0.36	1472 0.35	1504 0.34	1534 0.33	1559 0.33	1580 0.33
180	1580 0.41	1621 0.39	1659 0.38	1696 0.37	1731 0.36	1758 0.36	1782 0.36
200	1757 0.45	1803 0.43	1846 0.42	1888 0.41	1927 0.39	1957 0.39	1984 0.39
220	1933 0.48	1985 0.46	2034 0.45	2080 0.44	2123 0.43	2156 0.42	2185 0.42
240	2110 0.52	2167 0.50	2221 0.48	2271 0.47	2319 0.46	2355 0.45	2387 0.45
260	2286 0.56	2349 0.53	2407 0.52	2463 0.51	2515 0.49	2554 0.48	2589 0.48
280	2462 1.00	2530 0.57	2594 0.55	2654 0.54	2710 0.52	2753 0.51	2791 0.51
300	2637 1.04	2711 1.00	2780 0.58	2845 0.57	2906 0.55	2952 0.54	2993 0.54
320	2813 1.07	2892 1.04	2967 1.02	3036 1.00	3101 0.59	3150 0.57	3195 0.57
340	2988 1.11	3073 1.07	3153 1.05	3227 1.04	3296 1.02	3349 1.00	3397 1.00
360	3164 1.15	3254 1.11	3339 1.09	3417 1.07	3491 1.05	3547 1.03	3599 1.03
380	3339 1.19	3434 1.15	3524 1.12	3608 1.10	3686 1.08	3745 1.05	3800 1.05
400	3513 1.23	3615 1.18	3710 1.15	3798 1.14	3881 1.12	3943 1.08	4001 1.08
420	3688 1.26	3795 1.22	3895 1.19	3988 1.17	4076 1.15	4141 1.11	4202 1.11
440	3862 1.30	3975 1.25	4080 1.22	4177 1.20	4270 1.18	4339 1.14	4402 1.14
460	4037 1.34	4154 1.29	4265 1.26	4367 1.24	4465 1.22	4537 1.17	4603 1.17
480	4211 1.38	4334 1.33	4450 1.29	4557 1.27	4659 1.25	4735 1.20	4803 1.20
500	4384 1.42	4513 1.36	4635 1.33	4746 1.30	4853 1.28	4932 1.23	5003 1.23
520	4558 1.46	4692 1.40	4819 1.36	4935 1.34	5047 1.32	5130 1.26	5203 1.26
540	4732 1.49	4871 1.43	5003 1.40	5124 1.37	5241 1.35	5327 1.29	5403 1.29
AIR CONDITIONING OFF		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON			
△FUEL = - 2 %		△FUEL = + 3 %		△FUEL = + 5 %			

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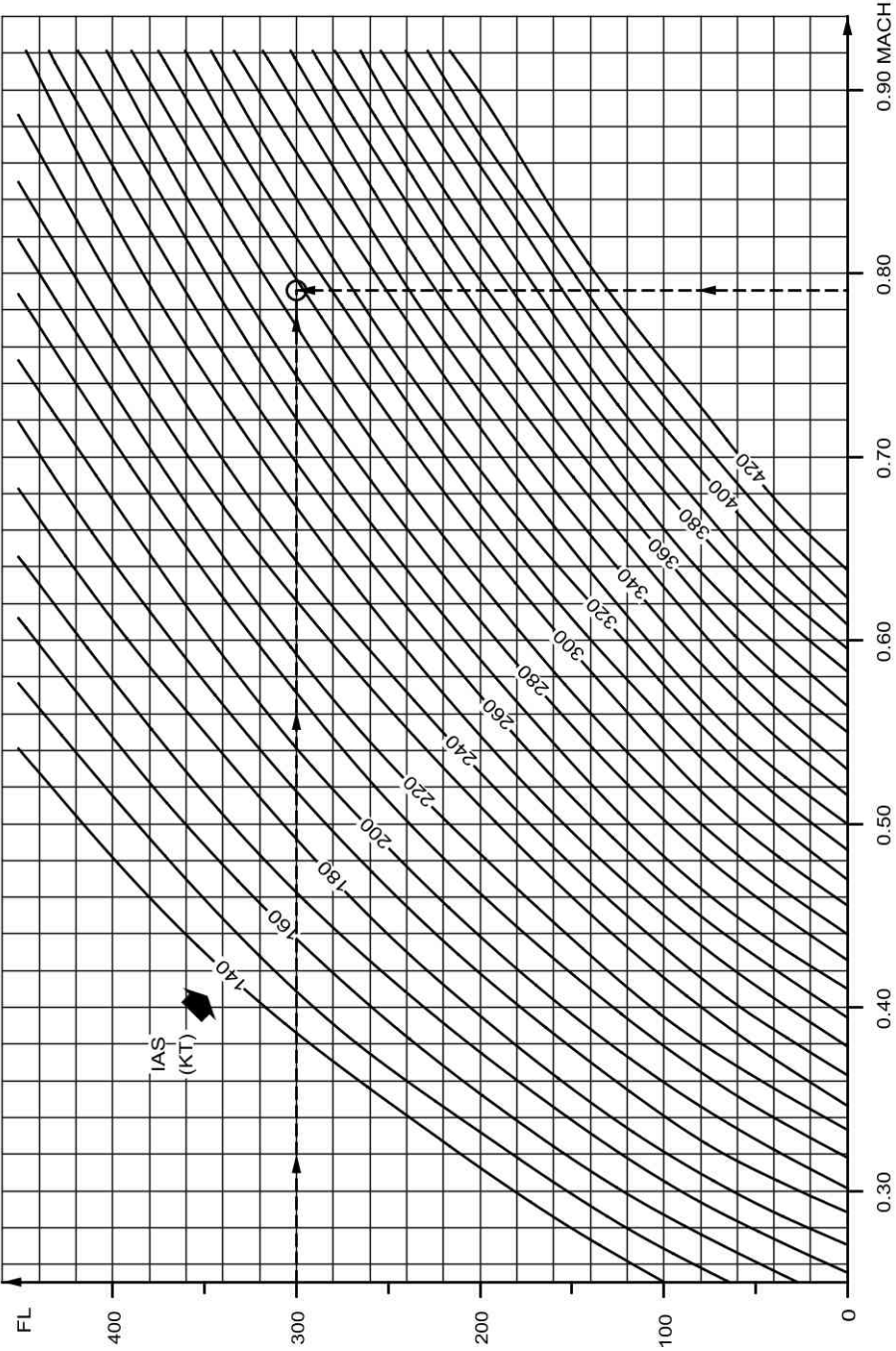
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## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: *In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.*

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$
 This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$
 This additional fuel must be added to the fuel predictions provided by the FMS.

Note: *Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:*

- *Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or*
- *If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.*

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

$\text{FPF (HYD G SYS LO PR)} = 10 \%$

$\text{FPF (INOP SYS: L AIL)} = 8 \%$

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (10 \% + 8 \%)$

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore,  $\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times 8 \%$

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)										
		54	58	62	66	70	74	78	82	86	90	94
		N1 %										
390	0.76	79.4	80.6	-	-	-	-	-	-	-	-	-
370	0.76	77.9	78.9	80.0	81.2	-	-	-	-	-	-	-
350	0.76	77.2	77.9	78.8	79.7	80.7	-	-	-	-	-	-
330	0.76	76.9	77.6	78.2	79.0	79.8	80.7	81.6	-	-	-	-
310	0.76	76.7	77.3	77.9	78.5	79.2	79.9	80.6	81.5	82.4	-	-
290	0.76	76.7	77.2	77.7	78.2	78.8	79.4	80.0	80.6	81.4	82.1	83.0
270	300	76.2	76.6	77.0	77.5	78.0	78.5	79.1	79.6	80.3	80.9	81.6
250	300	75.0	75.4	75.8	76.2	76.7	77.1	77.7	78.2	78.9	79.5	80.2
200	300	72.2	72.5	72.9	73.3	73.7	74.2	74.7	75.2	75.8	76.4	77.0
150	270	65.5	65.9	66.5	67.0	67.7	68.4	69.2	70.3	71.0	71.8	72.6
100	270	62.5	62.9	63.5	64.0	64.6	65.3	66.0	66.8	67.6	68.4	69.2
50	270	59.1	59.5	60.0	60.5	61.1	61.8	62.6	63.4	64.2	65.0	65.7

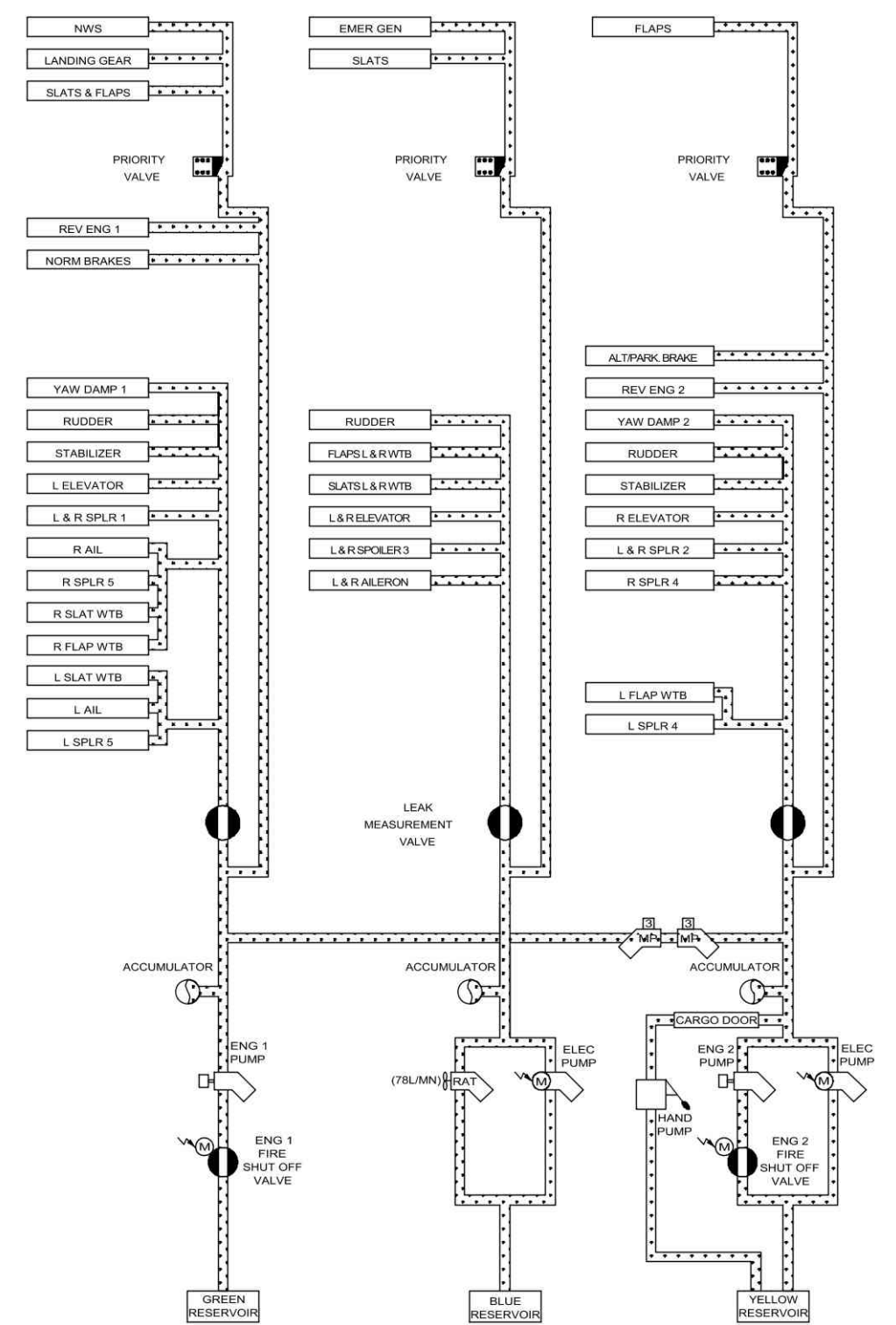
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

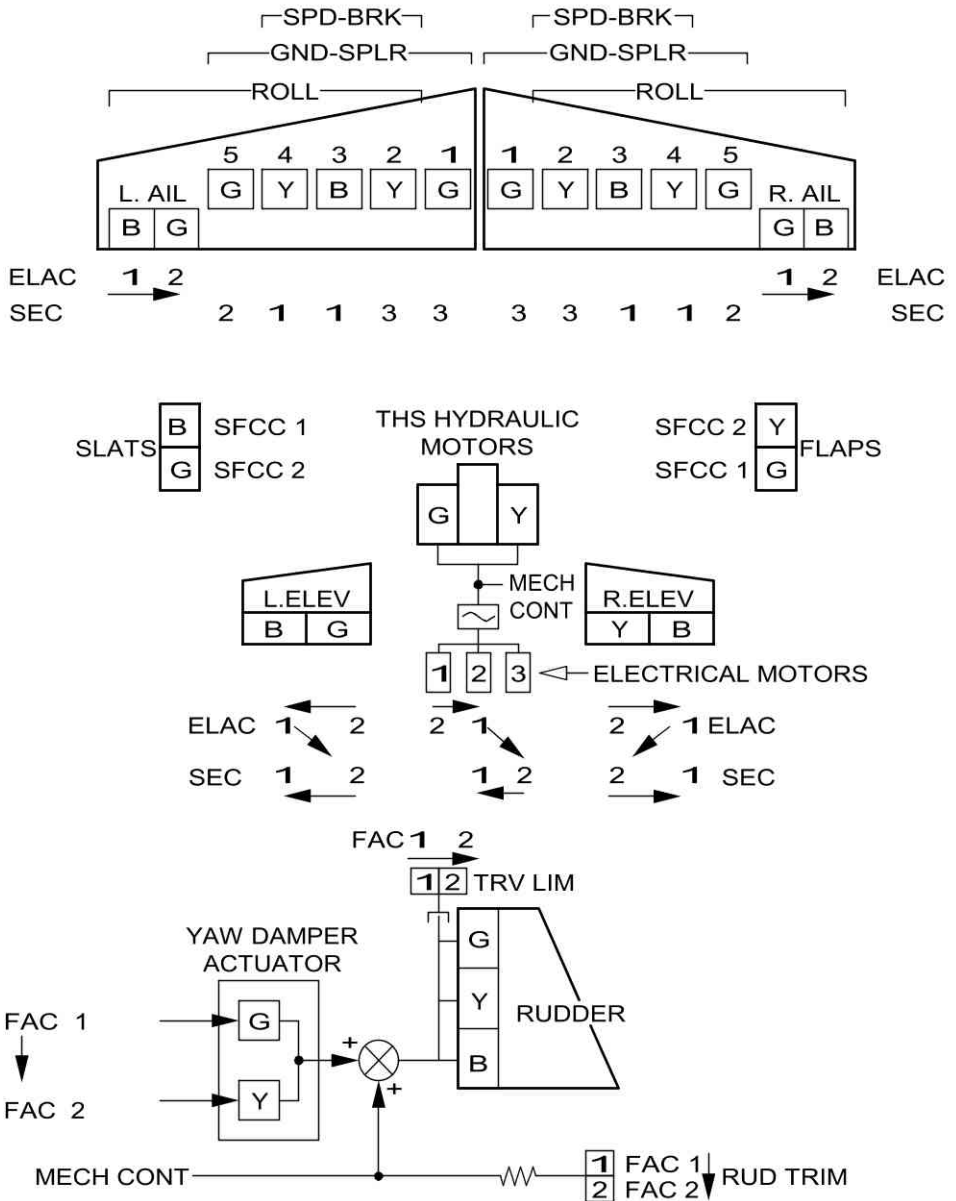
A/THR in managed speed.....USE

HYDRAULIC ARCHITECTURE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>11.00</b> 30 MAR 12
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## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an **ENG 1(2) OIL FILTER CLOG** ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		11.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTE					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTE					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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# OEB30 Issue 1.0

## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.


**Reason for issue:** This OEB replaces the A320 OEB 188.  
 One Operator reported a case where the flight crew initiated a Go Around slightly below the Minimum Descent Altitude (MDA), and the aircraft did not pitch up as expected. The flight crew performed a non precision approach (a VORDME approach) using the FINAL APP managed guidance mode with the AP1 (Autopilot) engaged during the final approach.  
 This OEB is issued to provide flight crews with an operational procedure to avoid such aircraft behavior.  
 The operational procedure provided in this OEB applies to all Non Precision Approaches, for both conventional approaches and RNAV approaches, flown in FINAL APP managed guidance mode.

**Applicable to:** All A318/A319/A320/A321 aircraft

**Cancelled by:** Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.  
 Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		30.00A
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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013526.0002001	30 MAR 12
Criteria: SA Applicable to: B-HTE					
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013527.0002001	30 MAR 12
Criteria: SA Applicable to: B-HTE					



## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

### ECAM ENTRY

None

### PROCEDURE

During a non precision approach, when using the FINAL APP managed guidance mode:

- **At DA(DH) or MDA(MDH), or earlier in approach if visual conditions are obtained:**

DISENGAGE the FINAL APP mode by pressing the APPR pushbutton on the FCU.

When the flight crew presses the APPR pb in order to disengage the FINAL APP managed guidance mode, a basic vertical guidance mode, either V/S or FPA, engages.

This ensures that the SRS and GA TRK guidance modes correctly engage, if the flight crew initiates a go-around slightly below MDA (MDH).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HTE				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HTE				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTE				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTE				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTE				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTE				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



# AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).



## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTE				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTE				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>44.00</b> 30 MAR 12
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## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTE				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTE				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	BLANK
		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HTF**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HTF</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HTF</b>				
	OEB30 issue 1.0	W	N	30 MAR 12	No SRS Engagement During Go Around Below MDA
	Criteria: SA <b>Applicable to: B-HTF</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HTF</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HTF</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HTF</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HTF</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12


<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-30	No SRS Engagement During Go Around Below MDA	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12


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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HTF</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

<b>M<sup>(1)</sup></b>	<b>MSN</b>	<b>FSN</b>	<b>Registration Number</b>	<b>Model</b>
	0633	HDA 0103	B-HTF	321-231


(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12


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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	K2113		30 AUG 10	FUSELAGE - REAR FUSELAGE SECTION 16A - DEFINE A321 BASIC STRUCTURE
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	Applicable to: ALL			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	Applicable to: ALL			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	Applicable to: ALL			
	34-1143 08		30 AUG 10	NAVIGATION - GLOBAL POSITIONING SYSTEM - ACTIVATE A PRIMARY GPS MEANS OF NAVIGATION USING LITTON GPS (CLASS C1 - HYBRID ARCHITECTURE).
	Applicable to: ALL			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	Applicable to: ALL			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	Applicable to: ALL			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	Applicable to: ALL			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	Applicable to: ALL			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	Applicable to: ALL			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	Applicable to: ALL			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	Applicable to: ALL			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	Applicable to: ALL			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+) STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	Applicable to: ALL			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DEACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	Applicable to: ALL			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	Applicable to: ALL			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	Applicable to: ALL			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	Applicable to: ALL			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	Applicable to: ALL			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	Applicable to: ALL			

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		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			
	P1872		30 AUG 10	AIR CONDITIONING - INSTALL CIRCUIT BREAKER FOR REAR CARGO COMPT VALVES FOR EROPS -
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P4287	31-1113 30 31-1264 04	07 APR 11	INDICATING/RECORDING SYSTEMS - FWC - DEFINE OEB REMINDER WITHIN FWC STD -E1 AND SUBSEQUENT
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	34-1101 24		30 AUG 10	NAVIGATION - TRAFFIC COLLISION AVOIDANCE SYSTEM - INSTALL TCAS II COLLINS SYSTEM.
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P3341		30 AUG 10	LANDING GEAR - WHEELS AND BRAKES - INSTALLATION OF MESSIER GOODRICH WHEELS AND BRAKES ON A321
	Applicable to: ALL			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	Applicable to: ALL			
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	Applicable to: ALL			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	Applicable to: ALL			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	Applicable to: ALL			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	34-1119 02		30 AUG 10	NAVIGATION - SATELLITE NAVIGATION - INSTALL DUAL LITTON GPS AS A SUPPLEMENTARY MEANS OF NAVIGATION.
	Applicable to: ALL			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	32-1369 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INTRODUCE BSCU STD 10.1 - SB ONLY.
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0070		30 AUG 10	AIR CONDITIONING - CARGO COMPARTMENT - VENTILATION - INSTALL SYSTEM IN AFT COMPARTMENT -
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	31-1141 04		30 AUG 10	INDICATING/RECORDING SYSTEMS - FWS - INTRODUCE FWC STANDARD H1P-E3P.
	<b>Applicable to: ALL</b>			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	<b>Applicable to: ALL</b>			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	<b>Applicable to: ALL</b>			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	<b>Applicable to: ALL</b>			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	<b>Applicable to: ALL</b>			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	34-1205 11		30 AUG 10	NAVIGATION - EGPWS - ADAPT EGPWS PIN PROGRAMMING TO A321 AIRCRAFT CONFIGURATION.
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**

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**GEN-PLP PRELIMINARY PAGES**

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### **SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
 As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

### **TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

#### **PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

#### **PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

#### **Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

### **ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

### **ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.



## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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**ABN-22 Auto Flight**

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**ABN-24 Electrical**

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**COCKPIT DOOR FAULT..... 25.01**

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**■ SMOKE/FUMES REMOVAL ■..... 26.01**  
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## CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

**CAUTION**

Check that  $\Delta P$  is zero before opening the doors.

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## LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### ■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:

#### ● When the system has recovered:

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### ■ DESCENT (IF TIME PERMITS) :

#### ● When the system has recovered:

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.


Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>		<b>EMER GEN RUNNING</b>	<b>BAT ONLY</b>	
			<b>IN FLIGHT</b>	<b>ON THE GROUND</b>
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
	AFT CRG ISOL VALVE	Norm	Inop	Inop
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1+ N° 2	N°1+ N°2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



*Continued from the previous page*

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a) Restored, when speed is below 100 kt.

(b) Crew oxygen valve inoperative.


(c) Lost, when speed is below 50 kt.

(d) Lost 30 s after last engine shutdown.

(e) IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f) For APU start only.

(g) Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK USABLE BY GRAVITY (2T UNUSABLE) <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
<b>VREF = VLS CONF FULL</b>	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV											
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94	
<b>DRY runway</b>	2 260	2 340	2 450	2 560	2 670	2 810	2 970	3 550	3 800	4 050	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.20										
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.95										
CORRECTIONS	+1 000 ft above SL						+10 kt tailwind				
<b>DRY Runway</b>	+3 %						+16 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.

In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT.....

ON
- If fuel vapors:
 

CAB FANS.....

ON

PACK 1+2.....

OFF
- If no fuel vapors:
 

CAB FANS.....

OFF

ECON FLOW.....

OFF
- LDG ELEV.....

10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude).....

INITIATE
- ATC.....

NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC.....

CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.
- At FL 100 or MEA
 

APU MASTER SW (if in ELEC EMER CONF).....

ON

PACK 1+2.....

OFF

MODE SEL.....

MAN

MAN V/S CTL.....

FULL UP

RAM AIR.....

ON

APU MASTER SW.....

OFF
- If smoke persists, open CKPT window:
 

MAX SPEED.....

200 KT

COCKPIT DOOR.....

OPEN

HEADSETS.....

ON

PNF COCKPIT WINDOW.....

OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALLEY..... OFF

SIGNS..... ON

CKPT/CABIN COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMER
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT.....ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATED:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100 or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL.....CONSIDER  
 ELEC EMER CONFIG.....CONSIDER  
*Refer to the end of the procedure to set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING.....CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

- **IF AIR COND SMOKE SUSPECTED:**  
 APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 CARGO AFT ISOL VALVE..... OFF  
 PACK 1..... OFF  
 ● **If smoke continues:**  
 PACK 1..... ON  
 PACK 2..... OFF  
 ● **If smoke still continues:**  
 PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ● **IF CAB EQUIPMENT SMOKE SUSPECTED:**  
 ● **If smoke continues:**  
 EMER EXIT LIGHT..... ON  
 BUS TIE..... OFF  
 GEN 2..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE  
 ● **If smoke still continues or if faulty  
equipment confirmed isolated:**  
 GEN 2..... ON  
 BUS TIE..... AUTO



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

- If faulty equipment not confirmed isolated, before L/G extension:  
 GEN 2..... ON  
 BUS TIE.....AUTO  
 SMOKE/FUMES REMOVAL..... CONSIDER

**UNDETERMINED/AVNCS/ELECTRICAL SMOKE**

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
 ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
 NORMAL VENTILATION..... RESTORE

**TO SET ELEC EMER CONFIG**

- EMER ELEC GEN 1 LINE.....OFF  
 EMER ELEC PWR..... MAN ON
- WHEN EMER GEN AVAIL:  
 APU GEN ..... OFF  
 GEN 2..... OFF

ELEC EMER CONFIG  
 APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- JUST BEFORE L/G EXTENSION:  
 GEN 2..... ON  
 EMER ELEC GEN 1LINE..... ON

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

### ■ Repeat the following until landing configuration is reached:

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.

### ● As speed reduces through VFE NEXT:

FLAPS LEVER..... ONE STEP DOWN

### ■ When landing configuration is established:

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

### ■ IF SLATS FAULT:

#### ● FOR CIRCUIT:

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

#### ● FOR DIVERSION

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

### ■ IF FLAPS FAULT:

#### ● FOR CIRCUIT:

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

#### ● FOR DIVERSION:

##### ● If FLAPS jammed at 0

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt

Note:


- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED


Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	215 kt	195 kt	190 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	215 kt		215 kt	195 kt	190 kt	
S > 3	190 kt		190 kt	190 kt	190 kt	

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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<b>SIDESTICK/RUDDER PEDALS STIFF</b>		
<p>Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:</p> <ul style="list-style-type: none"><li>- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or</li><li>- One sidestick and the rudder pedals at the same time.</li></ul> <p>The piloting technique remains the same: The aircraft remains responsive. However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.</p> <p>AP DISENGAGEMENT.....CONFIRM</p> <p>CONSIDER TRANSFERRING CONTROL TO PNF</p> <p>● <b>FOR DECRAB, ROLLOUT, OR ENGINE FAILURE</b></p> <p>BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL</p>		



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

# STABILIZER JAM

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

**● IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

**● IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP

FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

CAUTION	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON  
CTR TK L+R XFR..... OFF

- On the lighter side:  
FUEL PUMPS.....OFF
- When fuel is balanced:  
FUEL PUMPS..... ON  
CTR TK L+R XFR..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- A tank is overflowing (due to pipe rupture in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each wing tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK L+R XFR..... OFF

*Each engine is fed via its associated wing tank only.*

WING TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each wing tank.*

#### ■ CASE 1 : IF ONE WING TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the wing tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

CTR TK L+R XFR..... ON  
 FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The wing tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.





**FUEL LEAK (Cont'd)**

ENGINE RESTART..... CONSIDER  
 CTR TK XFR (non-leaking side)..... ON

<b>CAUTION</b>	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ **CASE 2 : IF BOTH WING TANKS DEplete AT A SIMILAR RATE:**

A leak from the Center tank or the APU feeding line may be suspected.

- **If fuel smell in the cabin:**  
 APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*

- **When fuel quantity in one wing tank is less than 3 t (6 600 lb ):**  
 CTR TK L+R XFR..... ON

**FOR LANDING**

<b>CAUTION</b>	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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## HYD B + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/.77  
 MANEUVER WITH CARE  
 Flight controls remain in normal law.

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR

W (1 000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW/FLAPS SLOW  
 GPWS LDG FLAP 3..... ON  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE** Only one ELEV and two spoilers per wing  
**SPOILERS** Only 2 per wing  
**REVERSER** Only N°1  
**BRAKING** NORMAL  
**NO NOSEWHEEL STEERING**

### GO-AROUND

NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>										
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94
<b>DRY runway</b>	1 400	1 450	1 520	1 590	1 650	1 740	1 840	2 200	2 350	2 500
<b>WET runway</b>	1 880	1 980	2 090	2 220	2 330	2 450	2 580	2 780	2 960	3 100
<b>CONTA runway</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75									

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 16 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

**HYD G + B SYS LO PR SUMMARY**

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

<b>W (1000 KG)</b>	52	56	60	64	68	72	76	80	84	88	92	94
<b>VREF = VLS CONF FULL</b>	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH
CAT 2 INOP
SLATS JAMMED/FLAPS SLOW
ATHR..... OFF
GPWS LDG FLAP 3..... ON
<ul style="list-style-type: none"> <li>● <b>WHEN SPD 200 KT</b></li> <li style="padding-left: 20px;">L/G..... GRVTY EXTN</li> <li>● <b>WHEN L/G down: USE MAN PITCH TRIM</b></li> <li style="padding-left: 20px;">For Flaps extension: SPD SEL..... VFE NEXT- 5KT</li> <li style="padding-left: 20px;"><i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i></li> </ul>

LANDING
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law
<b>SPOILERS:</b> Only 2 per wing
<b>REVERSER:</b> Only N°2
<b>BRAKING:</b> ALTERNATE
<b>NO NOSE WHEEL STEERING</b>


GO-AROUND
NO GEAR RETRACTION. Increased fuel consumption
<ul style="list-style-type: none"> <li>● <b>For circuit:</b></li> <li style="padding-left: 20px;">MAINTAIN SLATS/FLAPS CONFIGURATION</li> <li style="padding-left: 20px;">Recommended speed: MAX SPD - 10 kt</li> <li>● <b>For diversion:</b></li> <li style="padding-left: 20px;">SELECT CLEAN CONFIGURATION</li> <li style="padding-left: 20px;">If Slats at zero: Normal operating speeds</li> <li style="padding-left: 20px;">If Slats not at zero: Recommended speed MAX SPD -10 kt</li> </ul>

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>										
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94
DRY runway	1 520	1 580	1 650	1 730	1 800	1 890	2 000	2 390	2 560	2 720
WET runway	2 030	2 150	2 270	2 400	2 520	2 660	2 790	3 010	3 200	3 360
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.80									

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 16 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (*Refer to VAPP Calculation*).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/0.77  
 MANEUVER WITH CARE  
 ALTN LAW : PROT LOST

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 30 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW / FLAPS JAMMED  
 GPWS FLAP MODE..... OFF  
 ● **For Flaps extension:**  
 SPD SEL..... VFE NEXT - 5KT  
 When in landing CONF : DECELERATE TO CALCULATED VAPP  
 Stabilize at VAPP before L/G down, to be trimmed for approach.  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE:** PITCH AUTHORITY REDUCED (No stabilizer).  
 MAN TRIM Unusable  
 Only 1 spoiler per wing – Direct law  
**SPOILERS:** Only 1 per wing  
**NO REVERSER**  
**BRAKING:** BRK Y ACCU PR ONLY (7 applications)  
 MAX BRK PR 1 000 PSI  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption  
 ● **For circuit:**  
 MAINTAIN SLATS/FLAPS CONFIGURATION  
 Recommended speed: MAX SPD - 10 kt  
 ● **For diversion:**  
 ● **If Flaps at zero:**  
 SELECT CLEAN CONFIGURATION  
 Normal operating speeds  
 ● **If Flaps not at zero:**  
 MAINTAIN SLATS/FLAPS CONFIG  
 Recommended speed: MAX SPD - 10 kt

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
<b>DRY runway</b>	2 050	2 130	2 230	2 330	2 430	2 550	2 700	3 230	3 450	3 680	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.05										
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.00										
<b>CORRECTIONS</b>	<b>+ 1 000 ft above SL</b>					<b>+ 10 kt tailwind</b>					
<b>DRY runway</b>	+ 3 %					+ 16 %					

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).


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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

**RESIDUAL BRAKING PROC**

● **IN FLIGHT:**  
BRAKE PEDALS.....APPLY SEVERAL TIMES

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**  
A/SKID & N/W STRG selector..... KEEP ON

■ **IF AUTOBRAKE IS AVAILABLE:**  
FOR LANDING..... AUTO/BRK MED  
*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**  
JUST AFTER TOUCHDOWN.....APPLY BRAKING  
*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*  
*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*  
1. *If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*  
2. *If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

## LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <b>L/G GEAR NOT DOWN</b> ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOMELT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.







## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW

### (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

..... PULL AND TURN


L/G LEVER..... DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT




ADR 1 + 2 + 3 FAULT (Cont'd)

- DURING FINAL APPR  
V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup> At slats' extension, full rudder travel authority is recovered.

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**NAV FM / GPS POS DISAGREE**

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 ° ,
- 0.9 min for latitudes at or above 55 ° and below 70 ° ,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

● **If the message occurs during ILS/LOC approach (LOC green):**

DISREGARD it.

● **If the message occurs in climb, cruise, or descent:**

CHECK navigation accuracy, using raw data.

■ **If the check is positive:**

NAV mode and ND ARC/ROSE NAV may be used.

■ **If the check is negative:**

HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

■ **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**

Use the associated FD/AP.

■ **If not:**

Deselect GPS and revert to basic information.

● **If the message occurs during a Non Precision Approach (NPA):**

■ **Overlay approach:**

SELECT HDG, or TRK, and use raw data.

■ **GPS or RNAV approach:**

GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" - "TERRAIN TERRAIN PULL UP" - "OBSTACLE OBSTACLE PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "CAUTION TERRAIN" - "CAUTION OBSTACLE":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
 ALIGN light on during 30 s.  
 ATT MODE displayed on CDU.
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

- If “H” is written on the “5” key:
 

H KEY..... PRESS  
 Degree marker, 0 decimal point, ENT and CLR lights come on.

A/C HEADING..... ENTER
- If “H” is not written on the “5” key:
 

A/C HEADING..... ENTER  
 Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.  
 Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.  
 Heading will be displayed on the associated ND.  
 “HDG-ATT MODE” will be displayed on CDU.

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.





## TCAS WARNINGS

### ■ Traffic advisory: “TRAFFIC” messages:

Do not perform a maneuver based on a TA alone.

### ■ Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

### ● GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

### ■ When “CLEAR OF CONFLICT” is announced:

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 81 t	81 t-68 t	Below 68 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	4.0/70.7	4.0/66.4	4.0/61.5
2	F	7.0/68.9	7.0/64.6	7.0/59.9
1 + F	S	3.5/67.6	3.0/63.8	3.0/58.6
1	S	7.5/65.5	7.5/61.4	7.5/56.5
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200 -FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

#### ■ If at least one ADR is reliable:

Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

#### ■ If affected ADR(s) cannot be identified or all ADRs are affected:

ONE ADR..... KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF..... USE FLAP 3

APP SPD..... VLS +10

LDG DIST PROC..... APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

#### ■ To return to departure airport:

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

#### ■ To accelerate and clean up after takeoff:

Accelerate and clean up the aircraft in level flight:

THRUST..... CLB

FLAPS..... RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	270 kt	8.5/CLB	9.0/CLB	10.0/CLB
FL 50 - FL 100		8.0/CLB	8.0/CLB	9.0/CLB
FL 100 - FL 150		7.0/CLB	7.0/CLB	8.0/CLB
FL 150 - FL 200		6.0/CLB	6.0/CLB	6.5/CLB
FL 200 - FL 250	300 kt	4.0/CLB	4.0/CLB	4.0/CLB
FL 250 - FL 280		3.5/CLB	3.0/CLB	3.0/CLB
Above FL 280	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200-FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 280	M 0.76	-1.0/IDLE	-1.5/IDLE	-2.0/IDLE
FL 280-FL 200	300 kt	-0.5/IDLE	-1.5/IDLE	-2.5/IDLE
FL 200 - FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-1.5/IDLE
Below FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-2.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.0/IDLE	2.0/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.0/63.4	5.0/59.4	5.0/54.6
1	S	7.5/65.6	7.5/61.4	7.5/56.6
1+F <sup>(1)</sup>	S	3.5/67.6	3.0/63.8	3.0/58.6
2	F	7.0/68.5	7.0/64.7	7.0/59.9



UNRELIABLE SPEED INDICATION/ADR  
CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	4.0/74.8	4.0/71.0	4.0/65.8

(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.

FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	2.0/60.0	2.0/56.0	1.5/51.6

FLYING TECHNIQUE TO STABILIZE SPEED:

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target.  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



AIR DUAL BLEED FAULT (Cont'd)

- If engine bleed recovery was not successful, or if one pack is inoperative :
  - X BLEED..... CHECK OPEN
  - DESCENT TO FL200/MEA.....CONTINUE
  - Descend rapidly to FL 200, to recover the bleed supply from the APU*
  - APU.....START
  - Start the APU during the descent.*
- **AT, OR BELOW, FL200 :**
  - WING A.ICE..... OFF
  - APU BLEED must not be used for wing anti-ice.*
  - APU BLEED..... ON
  - MAX FL200
  - AVOID ICING CONDITIONS
- **IF ICE ACCRETION**
  - APPR SPD.....VLS + 10 KT
  - LDG DIST PROC..... APPLY
  - Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*



ENG DUAL FAILURE - FUEL REMAINING

As long as none of the engines recover, the flight crew should apply this paper procedure and then, if time permits, clear ECAM alerts and check the ECAM. STATUS page.

LAND ASAP

ENG MODE SEL.....IGN  
THRUST LEVERS.....IDLE  
OPTIMUM RELIGHT SPD.....280 KT

*Note:* In the case of an “ENG DUAL FAILURE” during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.

In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:

WEIGHT	Pitch (°)
At or below 60 000 kg/132 000 lb	-2.5
70 000 kg/154 000 lb	-1.5
80 000 kg/176 000 lb	-0.5

At 280 kt, the aircraft can fly up to about 2.4 nm per 1 000 ft (with no wind).

LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

EMER ELEC PWR.....MAN ON  
VHF1/HF1 /ATC1.....USE  
ATC.....NOTIFY  
FAC 1.....OFF THEN ON  
*Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.*

- IF NO RELIGHT AFTER 30 SEC:  
ENG MASTERS.....OFF 30 S/ON  
*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*
- IF UNSUCCESSFUL:  
CREW OXY MASKS (Above FL 100).....ON
  - WHEN BELOW FL 250  
APU (IF AVAIL).....START
  - WHEN BELOW FL 200  
WING ANTI ICE.....OFF  
APU BLEED.....ON  
ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
94	251	261	271
92	248	258	268
88	242	252	262
86	239	249	259
84	236	246	256
82	233	243	253
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 700 ft/min.

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
GALLEY.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 and L/G DOWN) will be approximately 1.1 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.  
MIN APPR SPEED.....160 KT



## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE

*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**

- **When in CONF 3 and VAPP:**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN

*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*

- **When L/G downlocked**

L/G lever..... DOWN

APPROACH SPEED..... ADJUST

*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*

GND SPLR..... ARM

MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**

PARKING BRK..... ON

ATC..... NOTIFY

FIRE pushbutton (ENG and APU)..... PUSH

AGENTS (ENG and APU)..... DISCH

*Engine Agent 2 is not available.*

- **If Evacuation required:**

EVACUATION..... INITIATE

ELT  ..... CHECK EMITTING

*If not, switch on the transmitter.*

- **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.*  
*If that causes a strong crosswind, ditch into the wind.*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING

ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*


**ENG DUAL FAILURE - NO FUEL REMAINING**

The flight crew should apply this paper procedure and then, if time permits, clear ECAM warnings and check the ECAM STATUS page.

THRUST LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
*Resetting FAC 1 also enables rudder trim recovery, even if no indication is available.*  
 OPTIMUM SPEED.....240 KT/GREEN DOT  
*Initially, fly 240 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 700 ft/min .

LANDING STRATEGY.....DETERMINE  
*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*  
 EMER ELEC POWER (if EMER GEN not in line).....MAN ON  
 VHF1/HF1  /ATC1.....USE  
 ATC..... NOTIFY  
 CREW OXY MASKS (Above FL 100).....ON  
 CABIN AND COCKPIT..... PREPARE  
 SIGNS.....ON  
 GALLEY..... OFF  
 USE RUDDER WITH CARE  
 ● **WHEN BELOW FL 150**  
 RAM AIR..... ON

**COMMON ACTIONS FOR THE APPROACH**

**APPROACH PREPARATION**

*Note:* Final descent slope, when configured (CONF 3; L/G DOWN), will be approximately 1.1 N/m per 1 000 ft (with no wind).

BARO..... SET  
 CREW MASKS/OXY SUPPLY (below FL 100).....OFF



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt.*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)
  - When in CONF 3 and VAPP  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - When L/G downlocked  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*  
  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

AT 2 000 FT AGL

CABIN.....NOTIFY FOR LANDING


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

AFTER LANDING

- When the aircraft has stopped :  
PARKING BRK.....ON  
ATC.....NOTIFY
  - If Evacuation required :  
EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - If Evacuation not required :  
CABIN CREW and PASSENGERS (PA).....NOTIFY



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell  
If that causes a strong crosswind, ditch into the wind..  
In all cases, touch down with a pitch attitude of approximately 11 °.  
Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF

AFTER DITCHING


ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

# **ENG RELIGHT (IN FLIGHT)**

MAX ALTITUDE.....See below  
 ENG MASTER (affected).....OFF  
 THR LEVER (affected)..... IDLE  
 ENG MODE SEL..... IGN  
 X BLEED ..... OPEN  
 WING A. ICE (for starter assist).....OFF  
 ENG MASTER (affected)..... ON

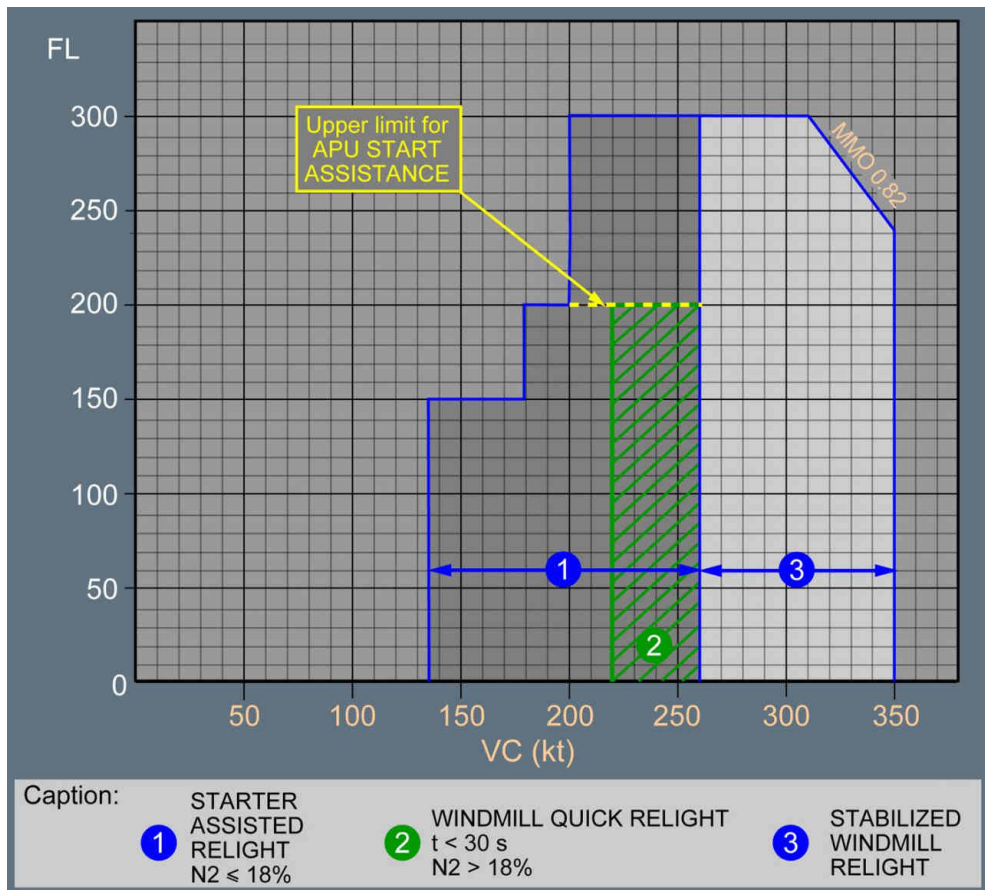
*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*  
*Engine light up should be achieved within 30 s after fuel flow increases.*

**■ When idle is reached:**

ENG MODE SEL..... NORM  
 TCAS MODE SEL  ..... check TA/RA  
*Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*  
 Affected SYS..... RESTORE

**■ If no relight:**

ENG MASTER (affected)..... OFF  
*Wait 30 s before attempting a new start (to drain the engine).*







## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION

External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1 ≥ 5 units, N2 ≥ 5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	76	74	71	68	64	61	58	54
5	76	74	71	68	64	61	56	52
10	76	74	71	68	64	59	54	
15	76	74	71	67	61	57	52	
20	76	74	69	64	59	54		
25	76	71	66	61	56			
30	73	68	64	59	54			
35	69	65	61	57	52			
40	66	62	59	55				
45	63	60	57					
50	60	57						
55	57							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

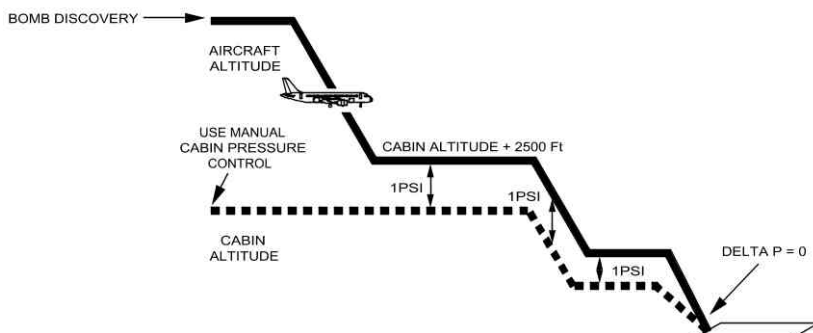
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE

*Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.*

NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN

*Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.*

DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



**BOMB ON BOARD (Cont'd)**

- When at CAB ALT+2 500 ft:**  
 1 PSI DELTA P..... MAINTAIN  
 GALLEY..... OFF  
 FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
 LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- For any other steps of descent:**  
 1 PSI DELTA P..... MAINTAIN
- During approach:**  
 CABIN PRESS MODE SEL..... AUTO
- When aircraft on ground and stopped in a remote area (if possible) :**
  - If evacuation required:**  
 EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - If evacuation not required:**  
 CABIN CREW and PASSENGERS (PA)..... NOTIFY

**CABIN PROCEDURES**

If a suspect device is found in the cabin:

<b>WARNING</b>	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
<b>WARNING</b>	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
<b>CAUTION</b>	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
 BOMB..... DO NOT CUT WIRES  
 BOMB..... SECURE AGAINST SLIPPING  
 BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF  
*The cabin crews must command passengers to switch off all portable electronic devices.*



## BOMB ON BOARD (Cont'd)

### BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

### EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

### GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

#### ● If the bomb can be moved:

#### RH AFT CABIN DOOR SLIDE.....DISARM

#### LEAST RISK BOMB LOCATION (LRBL).....PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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### BOMB INDICATION LINE.....POSITION

Note: *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

### BOMB.....MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

<b>CAUTION</b>	<b>Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.</b>
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### LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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*Build up at 25 cm (10 in) of wetted material around the sides and on top of the bomb.*







## BOMB ON BOARD (Cont'd)

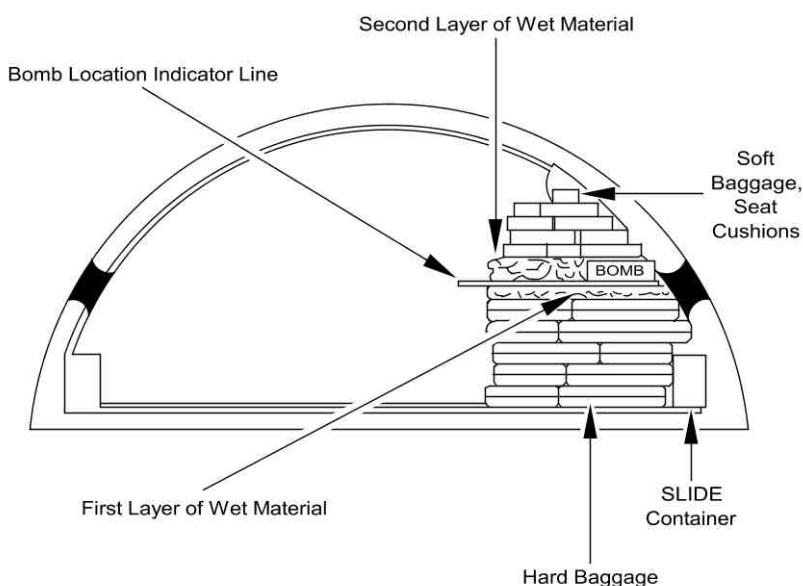
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



### PASSENGERS.....MOVE/ADVISE

*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

### CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*

### EVACUATION/DISEMBARKATION.....EXECUTE

*Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".*

*Use all available airport facilities to disembark without delay.*

## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

GALLEY.....OFF

LDG ELEV..... SELECT 00

BARO..... SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW..... OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU)..... DISCH

EVACUATION..... INITIATE



## FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### PREPARATION

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR..... OFF

SIGNS..... ON

GALLEY..... OFF

LDG ELEV..... SET

BARO..... SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100)..... OFF

### APPROACH

RAM AIR..... ON

L/G lever..... DOWN

SLATS AND FLAPS..... MAX AVAIL

GND SPLR..... ARM

MAX BRK PR..... 1 000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

#### ● When aircraft has stopped:

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ If Evacuation required:

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)		
<div>■ If Evacuation not required: CABIN CREW and PASSENGERS (PA)..... NOTIFY</div>		



## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS..... ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*

### WHEN DESCENT ESTABLISHED


EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

#### CAUTION

*Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: *The recommendation is to descend with the autopilot engaged.  
Use of the autopilot is also permitted in EXPEDITE mode .*

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

Use the ECAM flap setting, if required for abnormal operations. In all other cases :

- FULL is preferred for optimized landing performance
  - If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.

Note: At very high weights, VFE CONF1 is close to VLS clean. To select CONF1, deselect A/THR, decelerate to (or slightly below) VLS and select CONF1 when below VFE. When established at CONF1, the crew can re-engage the A/THR and use managed speed again

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.

● In the final approach stages

TARGET SPEED..... VLS

Reduce the selected speed on the FCU to reach VLS at runway threshold.  
Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).

● At main landing gear touchdown


REVERSE THRUST..... USE MAX AVAILABLE

● After nosewheel touchdown

BRAKES.....APPLY AS NECESSARY

Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.

● Landing complete

BRAKE FANS  ..... ON

Be prepared for tire deflation, if temperatures exceed 800 °C.

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	92	88	82	76	70	65	60	55
15	92	88	82	76	70	65	60	55
20	92	88	82	76	70	65	60	55
25	92	87	80	75	69	64	59	
30	92	85	79	73	68			
35	88	82	76	70	65			
40	85	79	73	68				
45	82	75	70					
50	78	72						
55								



## STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**

*This will reduce angle of attack*

Note: In case of lack of pitch down authority, reducing thrust may be necessary.

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

**SPEEDBRAKES..... CHECK RETRACTED**

**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

## STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**

**BANK..... WINGS LEVEL**

Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.

**TAILSTRIKE**

In the event of a tailstrike, apply the following procedure:

**LAND ASAP**

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF





## VOLCANIC ASH ENCOUNTER

● **If the aircraft enters a volcanic ash cloud:**

180 ° TURN..... INITIATE  
ATC..... NOTIFY  
A/THR..... OFF  
THRUST (conditions permitting).....REDUCE  
CREW OXYGEN MASKS.....ON/100 %/EMER  
CABIN CREW.....NOTIFY  
PASSENGER OXYGEN.....AS RQRD  
ENG ANTI ICE..... ON  
WING ANTI ICE..... ON  
ECON FLOW.....OFF

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

APU..... START  
ENGINE PARAMETERS..... MONITOR  
AIRSPEED INDICATIONS.....MONITOR

If airspeed is unreliable or lost, Refer to the QRH ABN 34 Unreliable Speed Indication / ADR Check Proc procedure.

Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.

In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.

To manually depressurize the cabin:

CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... FULL UP

Due to the increased noise level, pay particular attention to visual warnings.

## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

Note: When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● **Before takeoff**

Delay takeoff, or select the most favorable runway.

##### ● **During the takeoff run**

Reject takeoff.

Note: Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● **When airborne**

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5°. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ **Before TAKEOFF**

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note:    - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
               - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.


#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note:    1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
               2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.



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<b>WINDSHEAR (Cont'd)</b>		
<p> <b>■ Airborne, initial climb or landing</b>            THR LEVERS AT TOGA.....SET OR CONFIRM            AP (if engaged).....KEEP            SRS ORDERS..... FOLLOW  <i>This includes the use of full backstick, if demanded.</i>  <u>Note:</u>    1. If engaged, the autopilot disengages when <math>\alpha</math> is greater than <math>\alpha</math> prot.                          2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.            DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.            CLOSELY MONITOR FLIGHT PATH AND SPEED.            RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.         </p>		

WINDSHIELD/WINDOW ARCING

Affected WINDOW/WINDSHIELD ANTI ICE C/B..... PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)

WINDSHIELD/WINDOW CRACKED

DIAGNOSIS OF INNER PLY.....PERFORM  
*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ If no crack on cockpit side:

No limitation  
*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ If cracks on cockpit side:

MAX FL..... 230/MEA  
*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain ΔP 5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note:     *The following procedure allows maintaining ΔP 5 PSI in manual cabin pressure mode.*

CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... AS RQRD

Set the cabin altitude, according to the table below:

ΔP = 5 PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000


● When starting the descent for approach:

CAB PRESS MODE SEL..... AUTO

Note:     *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

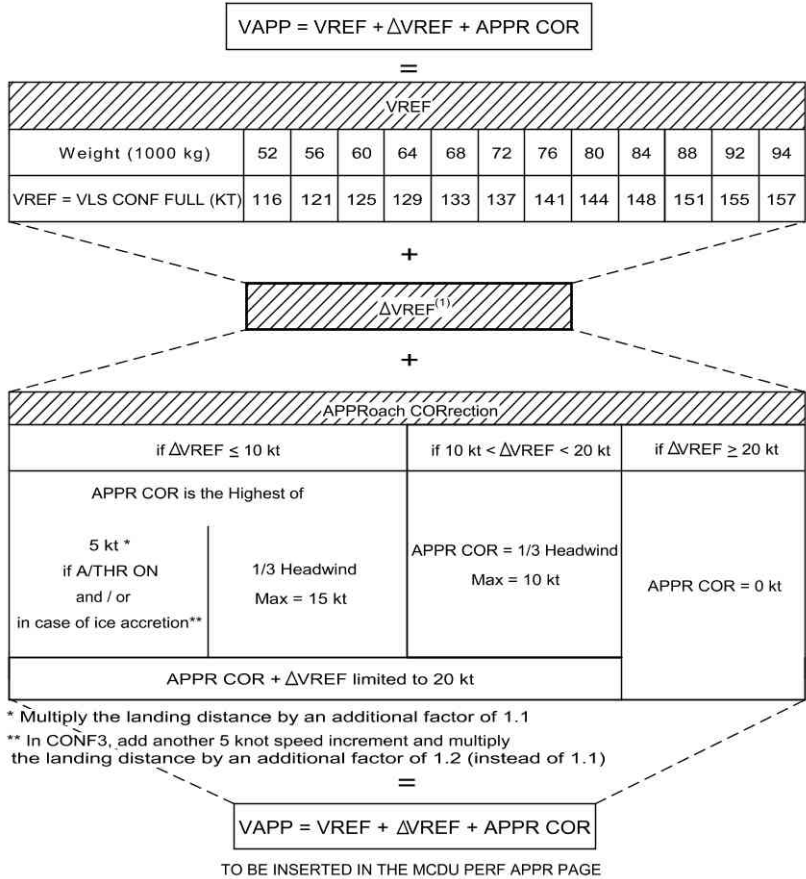
CAB PRESS MODE SEL..... MAN  
MAN V/S CTL..... FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>				
<b>SYSTEM</b>	<b>CONDITIONS</b>	<b>RECOMMENDED ACTION</b>		
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)		
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control		
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control		
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.		
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>		
	Fuel temp greater than 45 °C in wing tank	GALLEY (OFF)		
	Fuel temp lower than -40 °C in wing tank	Consider descending to a lower altitude, and/or increasing Mach to increase TAT.		
APU	EGT > EGT MAX -33 °C (inhibited during APU start)			
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.		
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"><li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li><li>- If oil pressure is below 60 PSI (red indication), without the <b>ENG</b> OIL LO PR warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li></ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.		
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.		
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <i>Note: If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended: 1. <i>Low Speed-</i> Increase engine speed to increase fuel flow, and thereby cool IDG oil. 2. <i>High Speed-</i> Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.		
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.		
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.		
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).		

# VAPP CALCULATION

## VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



(1) Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables

EXAMPLE OF VAPP CALCULATION:

- Failure : ALTN LAW
- Flight Conditions : Autothrust ON, ice accretion
- Landing Configuration : CONF 3
- Headwind : 12 kt
- Landing Weight/CG : 60 t
- VREF determined from the landing weight : 125 kt
- VREF correction due to the failure (ΔVREF) : 10 kt


As ΔVREF is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- 5+5 = 10 kt (ice accretion and landing in CONF 3)
- 1/3 Headwind = 12 kt/3 = 4 kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

VAPP = VREF + ΔVREF + APPR CORR = 125 + 10 + 10 = 145 kt



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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors** “WITHOUT REV” when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors** “WITH REV” when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:     *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### **LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE**

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### **LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES**

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)


Examples applicable to Dry runways /A/THR ON / No wind / WITHOUT REV. / Without ice accretion:

FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.60
	3	6			1.75
RESULT	3	10			$1.40 \times 1.75 \times 1.1 = 2.70$


VREF = 131 kt. Therefore  $VAPP = 131 + 10 + 5 = 146$  kt..

 <div>DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>		<b>ABNORMAL AND EMERGENCY PROCEDURES</b>			<b>80.15A</b>
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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	30			1.95*
RESULT	3	30			1.95

VREF = 140 kt. Therefore VAPP = 140+30 = 170 kt.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>					
<b>DRY RUNWAYS</b>					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.50	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.75 2.75	2.75 2.75
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.80 2.00	N/A N/A
	EMER ELEC CONF	3	10	2.75	N/A
	S/F	FLAPS and SLATS at zero			
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
FLAPS < 1					
S<1		3	45	2.30*	2.10*
S≥1		3	30	1.95*	1.75*
1≤FLAPS<2					
S<1		3	30	1.85*	1.70*
S≥1		3	15	1.50*	1.40*
2≤FLAPS<3					
S<1		3	25	1.70*	1.60*
S≥1		3	10	1.40*	1.30*
FLAPS=3					
S<1		3	25	1.65*	1.55*
1≤S≤3		3	10	1.35*	1.25*
S>3		3	5	1.25*	1.20*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.55	1.45 1.55
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.35 1.45
SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.30	
RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.65	1.35 1.50	
SEC 1+2+3 FAULT	3	10	1.65	N/A	
ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.25*	



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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.45	1.30 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	GREEN + BLUE	3	25	1.85	1.75
	GREEN + YELLOW	3	30	2.50	N/A
	BLUE + YELLOW	3	10	1.70	1.65
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.60 1.75	1.50 1.60
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.30 1.45
	IR 1+2+3 FAULT	3	10	2.45	2.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.25*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.30*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.


<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.



**LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY**

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.35	1.15 1.25
	DC EMER CONF	FULL 3	- 6	2.20 2.20	2.20 2.20
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	N/A N/A
	EMER ELEC CONF	3	10	2.20	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.85*
	FLAPS<1				
	S<1	3	45	2.00*	1.75*
	S≥1	3	30	1.70*	1.50*
	1≤FLAPS<2				
	S<1	3	30	1.70*	1.50*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.55*	1.40*
	1≤S≤3	3	10	1.30*	1.20*
	S>3	3	5	1.20*	1.10*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.25*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.40 1.55	1.25 1.35
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.20*



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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.15 1.30
	GREEN + BLUE	3	25	1.95	1.80
	GREEN + YELLOW	3	30	2.05	N/A
	BLUE + YELLOW	3	10	1.80	1.70
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup>	FULL	10	1.25	1.15
	if there is ice accretion	3	16	1.35	1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.20
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
NAV	IR 1+2+3 FAULT	3	10	1.75	1.75
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.35*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.30*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1	55 (APPR)	1.85*	1.75*
		3	40 (THRESHOLD)	1.30*	1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL	10	1.25	1.15
		3	16	1.35	1.25

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.


<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)



**LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY**

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.15 1.25
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.90 1.95
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	N/A N/A
	EMER ELEC CONF	3	10	1.95	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.75*
	FLAPS < 1				
	S<1	3	45	2.00*	1.65*
	S≥1	3	30	1.70*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.60*	1.35*
	S≥1	3	15	1.40*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.50*	1.30*
	S≥1	3	10	1.30*	1.10*
	FLAPS=3				
	S<1	3	25	1.45*	1.25*
	1≤S≤3	3	10	1.25*	1.05*
	S>3	3	5	1.15*	1.00*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.10*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.30 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.25
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.15
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.25*	1.05*



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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.10 1.20
	GREEN+BLUE	3	25	1.80	1.65
	GREEN + YELLOW	3	30	2.00	N/A
	BLUE + YELLOW	3	10	1.75	1.55
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	IR 1+2+3 FAULT	3	10	1.35	1.35
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.30*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.25*	1.05*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.25*	1.70* 1.15*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.




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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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### COMPUTER RESET

When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor.

The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.

The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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**COMPUTER RESET TABLE**

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
21	VENT AVNCS SYS FAULT	AEVC	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B Y 17 on 122VU</li> <li>- Wait 1 s before pushing the C/B.</li> </ul>
22	AUTO FLT FCU 1(2) FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li> <li>- Push it after 5 s.</li> <li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul>
22	AUTO FLT FCU 1+2 FAULT	FCU	<p><b>In flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s.</li> <li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li> </ul> <p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li> <li>- Push them after 5 s</li> <li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> <li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li> <li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li> <li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li> <li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li> </ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"> <li>- RE-ENTER the barometer altimeter setting value, if necessary.</li> </ul>




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G01 on 49VU, M06 on 121VU. G02 on 49VU, M07 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: M06, M07, G01, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<p><b>On ground, or in flight:</b></p> <p>Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT &amp; PURS CAPT sw to the CAPT only position. Wait for 3 s.</p> <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M07 on 121VU.</li> </ul> </li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M06 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M07, G02</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<p><b>On ground, or in flight:</b></p> <p>The flight crew must reset all the RMPs one after the other via the RMP control panel:</p> <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP* in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL: <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE LAV + CRG DET FAULT	SDCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset		
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul> <table border="1"><tr><td><b>CAUTION</b></td><td>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</td></tr></table> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.
	<b>CAUTION</b>	Do not reset ELAC, if uncommanded maneuvers occurred during flight.			
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<table border="1"><tr><td><b>WARNING</b></td><td>Do not reset more than one computer at a time.</td></tr></table> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>	<b>WARNING</b>	Do not reset more than one computer at a time.
<b>WARNING</b>	Do not reset more than one computer at a time.				
ELAC or SEC malfunction	ELAC or SEC	<table border="1"><tr><td><b>WARNING</b></td><td><p>Do not reset more than one computer at a time.</p><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul><p><b>Note:</b></p><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></td></tr></table>	<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>	
<b>WARNING</b>	<p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul>				
28	Loss of fuel quantity indication	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"><li>- Pull the C/B of the affected channel:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the C/B.</li></ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>		
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul>		





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	<u>BRAKES</u> SYS 1(2) FAULT or <u>BRAKES</u> BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><b>Note:</b> After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><b>Note:</b> After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	<u>WHEEL</u> N.W STEER FAULT or <u>WHEEL</u> N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><b>Note:</b> After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	<u>L/G</u> LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1: <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2: <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>
34	<u>NAV</u> TCAS FAULT	TCAS	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
46	ATSU Malfunction	ATSU	<p>An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.</p> <p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>



# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits:
  - AUTOLAND (HWC30 / TWC10 / XWC20)
  - MANUAL LAND (HWC40 / TWC10 / XWC25)
  - OEI ROLLOUT (IDLE REV ONLY XWC15)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
 Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note:     The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

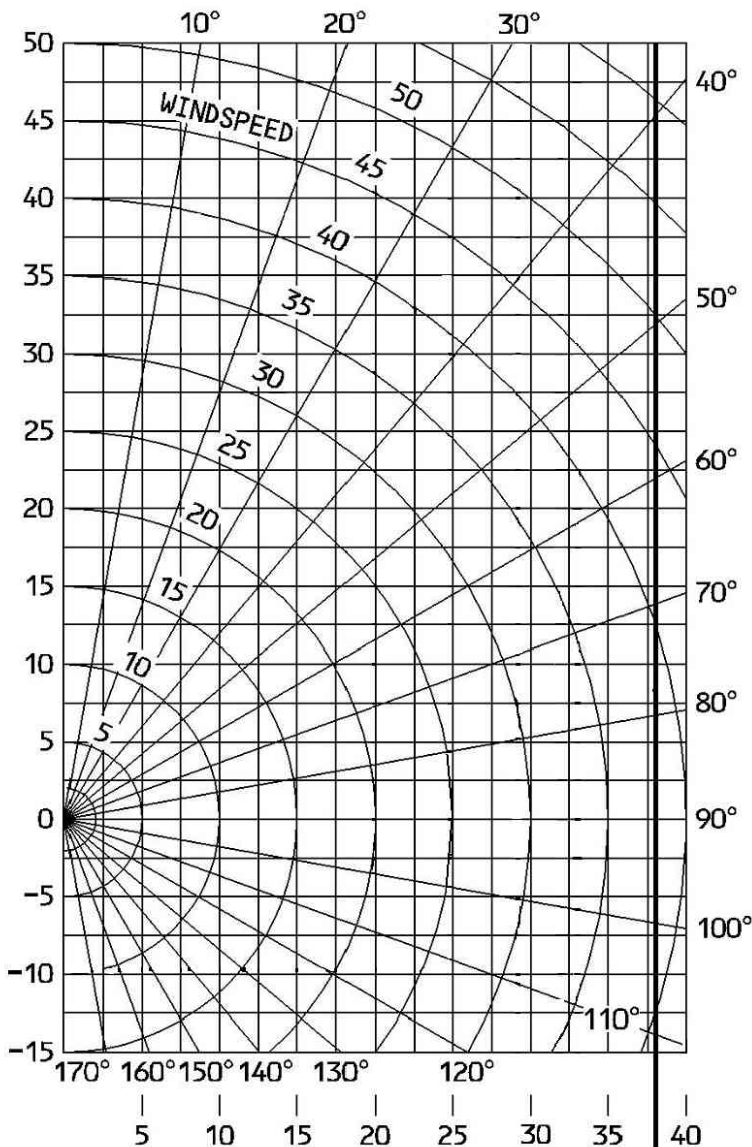
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## WIND COMPONENT CHART - A321



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

CAT II Autoland  
30 knots headwind  
20 knots x-wind  
10 knots tailwind  
15 knot x-wind limit  
for OEI Rollout with  
IDLE reverse only.

CAT II No Autoland  
40 knots headwind  
25 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A321

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02	
			S ≥ 1	03	NAV	IR 1+2+3 FAULT		01
	1 ≤ FLAPS < 2	S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02		
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT		03
	2 ≤ FLAPS < 3	S < 1	06	BLEED		DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01
			S ≥ 1		07			
	FLAP = 3	S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	09			REV UNLOCK with buffet (CONF 3)		02
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
		FLAP > 3	S < 1	11				
			1 ≤ S ≤ 3	12				
			S > 3	13				
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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<b>SPEEDS</b>
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OPERATING SPEEDS (KT)					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
52	130	168	188	121	116
56	135	174	194	125	121
60	140	180	200	130	125
64	144	186	206	134	129
68	149	192	212	138	133
72	153	197	218	142	137
76	157	203	224	146	141
80	161	208	230	150	144
84	165	213	236	154	148
88	169	218	242	157	151
92	173	223	248	161	155
94	175	226	251	163	157

(1) Above FL 200 add 1 kt per additional 1 000 ft.

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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

W(1000Kg)	52	56	60	64	68	72	76	80	84	88	92	94
VLS CONF FULL (KT)	116	121	125	129	133	137	141	144	148	151	155	157
VLS CONF 3 (KT)	121	125	130	134	138	142	146	150	154	157	161	163

+

CORRECTION

5KT <sup>(1)</sup>	1/3 HEADWIND (EXCLUDING GUST) MAX=15KT
WHICHEVER IS HIGHER	

=

VAPP

$$V_{APP}^{(2)} = \text{MAX}(VLS + 5Kt^{(1)}; VLS + W_{IND} \text{ CORR})$$

1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
  2. In case of ice accretion, Vapp must not be lower than:
    - VLS + 5 kt in CONF FULL
    - VLS + 10 kt in CONF 3
- In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		860	900	940	980	1020	1070	1150	1370	1470	1570
	WET		1110	1180	1250	1330	1400	1470	1540	1670	1770	1860
	COVERED WITH	STANDING WATER	1550	1660	1760	1880	1990	2080	2200	2310	2420	2520
		SLUSH	1490	1580	1670	1770	1870	1980	2070	2170	2280	2370
		COMPACTED SNOW	1390	1460	1530	1600	1670	1730	1790	1850	1920	1980
		ICE	2780	2910	3050	3190	3310	3440	3560	3700	3830	3950
CORRECTION ON ACTUAL LANDING DISTANCE												
RUNWAY CONDITION	dry runway	wet runway	runway covered with									
			standing water	slush	compacted snow		ice					
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %		+5 %					
per 10 kt headwind	No correction for headwind due to wind correction on approach speed											
per 10 kt tailwind	+16 %	+21 %	+22 %	+21 %	+16 %		+26 %					
2 reversers operative	-5 %	-8 %	-17 %	-16 %	-11 %		-29 %					
Per 5 kt speed increment (and no failure) add 8 % (all runways)												

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 74 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 1 020 m

Read from the Corrections table,  
Pressure altitude correction: 3 x 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt no reversers) = 1020 x 1.06 x 1.08 = 1 170 m.

## LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		820	850	890	930	970	1020	1080	1290	1380	1470
	WET		1040	1100	1160	1230	1290	1360	1430	1540	1640	1720
	COVERED WITH	STANDING WATER	1430	1530	1640	1740	1840	1940	2030	2140	2240	2340
		SLUSH	1390	1470	1560	1640	1730	1820	1920	2020	2120	2210
		COMPACTED SNOW	1310	1380	1440	1510	1570	1630	1680	1750	1810	1860
		ICE	2590	2720	2850	2970	3090	3210	3320	3450	3580	3690

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+4 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+16 %	+21 %	+24 %	+22 %	+16 %	+27 %
2 reversers operative	-4 %	-8 %	-16 %	-15 %	-11 %	-28 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW =74 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 970 m

Read from the Corrections table,  
 Pressure altitude correction: 3 x 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 970 x 1.06 x 1.08 = 1 120 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		MODE	54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND
RUNWAY CONDITION												
DRY		MED LOW	1340 1920	1440 2100	1550 2290	1650 2460	1810 2640	1970 2810	+5 +3	0 0	+13 +15	-2 -2
WET		MED LOW	1410 1920	1540 2100	1690 2290	1830 2460	2010 2640	2200 2810	+6 +3	-3 0	+17 +15	-3 -2
COVERED WITH	STANDING WATER	MED LOW	1770 1900	1990 2090	2210 2300	2410 2490	2640 2720	2860 2940	+6 +4	-17 0	+21 +18	-4 -2
	SLUSH	MED LOW	1700 1860	1890 2030	2100 2220	2290 2400	2490 2590	2690 2790	+7 +5	-16 0	+21 +17	-3 -2
	COMPACTED SNOW	MED LOW	1580 1870	1700 2050	1830 2230	1940 2390	2060 2560	2170 2730	+6 +4	-12 0	+15 +15	-2 -2
	ICE	MED LOW	2980 3000	3240 3260	3530 3550	3780 3800	4040 4060	4290 4320	+6 +5	-29 -26	+25 +26	-4 -4

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	
RUNWAY CONDITION	MODE											
DRY		MED LOW	1280 1830	1370 1990	1460 2150	1530 2300	1660 2450	1800 2590	+3 +3	0 0	+13 +14	-1 -2
WET		MED LOW	1330 1830	1440 1990	1560 2150	1670 2300	1820 2450	1980 2590	+4 +3	-2 0	+16 +14	-2 -2
COVERED WITH	STANDING WATER	MED LOW	1660 1810	1830 1980	2020 2150	2190 2310	2400 2490	2580 2660	+4 +4	-16 0	+20 +18	-3 -2
		SLUSH	MED LOW	1590 1770	1760 1930	1940 2080	2080 2220	2270 2380	2440 2540	+5 +5	-16 0	+20 +16
	COMPACTED SNOW		MED LOW	1500 1780	1600 1940	1710 2090	1800 2230	1890 2380	1970 2520	+4 +4	-11 0	+14 +14
		ICE	MED LOW	2790 2810	3030 3050	3270 3290	3490 3510	3720 3740	3940 3960	+5 +5	-28 -26	+25 +26

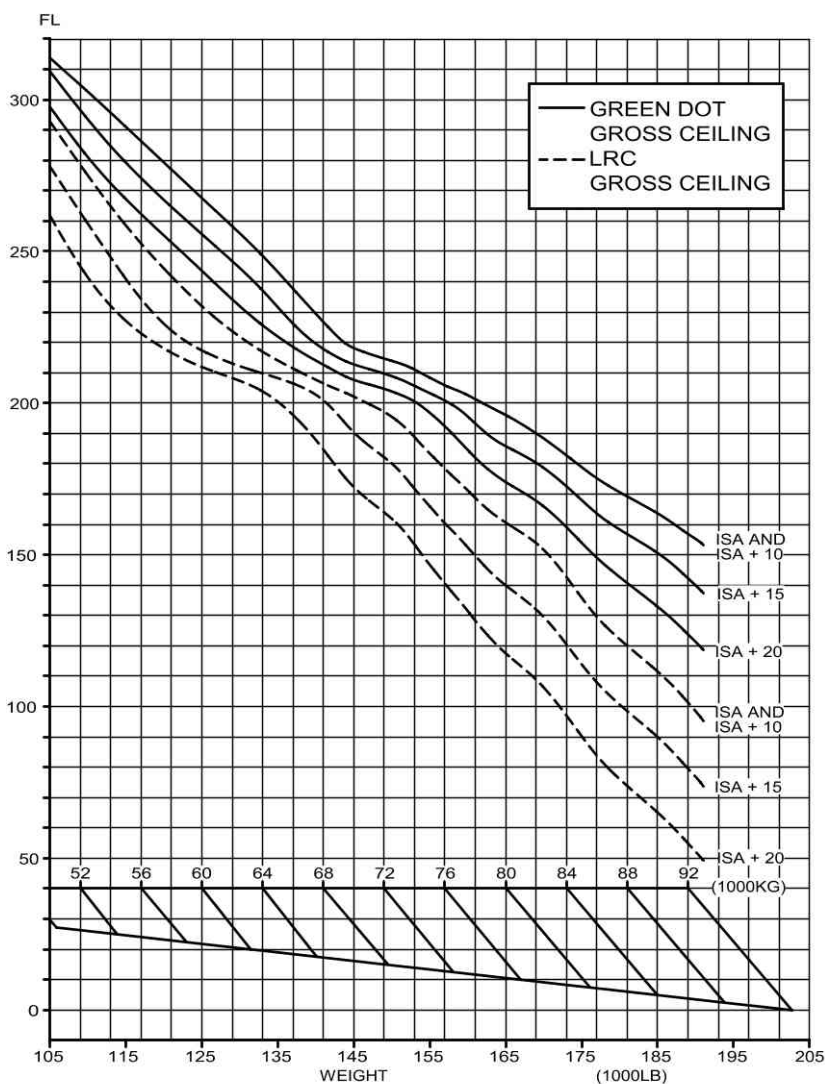
Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).



## CEILINGS

### ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA	ISA + 10	ISA + 15	ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-1 300 ft	-1 400 ft	-1 400 ft
	TOTAL ANTI ICE ON	-2 800 ft	-2 800 ft	-2 800 ft	-3 000 ft
GREEN DOT	ENGINE ANTI ICE ON	-1 000 ft	-1 000 ft	-1 100 ft	-1 200 ft
	TOTAL ANTI ICE ON	-2 100 ft	-2 100 ft	-2 300 ft	-2 500 ft

Note: For weights 85 000 kg or 187 400 lb, one engine ceilings at Long Range speed may be overestimated by FMS Legacy. In this case, ceiling values provided in the above graph should be retained.

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## GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

### ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		DISTANCE (NM) INITIAL SPEED (KT)		TIME (MIN) FUEL(1000KG)
					LEVEL OFF (FT)		
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL						
	250	290	310	330	350	370	390
50				174 32 198 .9 31700	228 42 200 1.1 31800	262 47 202 1.3 31900	288 52 204 1.3 31900
54			156 29 202 .9 30100	222 41 204 1.2 30200	258 47 206 1.4 30300	285 52 208 1.5 30300	308 55 210 1.5 30400
58		152 29 206 .9 28200	231 43 208 1.3 28500	269 50 210 1.5 28600	298 54 212 1.7 28600	320 58 214 1.7 28700	339 61 216 1.8 28700
62		236 45 212 1.5 26400	279 52 214 1.7 26600	309 57 216 1.8 26600	333 61 218 1.9 26700	352 64 220 2.0 26700	369 67 222 2.1 26800
66	155 30 214 1.1 24200	281 53 218 1.8 24600	314 59 220 2.0 24600	339 63 222 2.1 24700	360 67 224 2.2 24700	378 69 226 2.3 24800	393 71 228 2.3 24800
70	231 45 220 1.7 22600	311 59 224 2.1 22800	335 63 226 2.2 22800	357 67 228 2.3 22900	376 70 230 2.4 22900	392 72 232 2.5 22900	406 74 234 2.5 23000
74	214 41 226 1.6 21300	278 53 230 2.0 21400	301 56 232 2.1 21400	321 60 234 2.2 21500	339 62 236 2.2 21500	354 65 238 2.3 21500	
78	212 40 232 1.6 20500	264 49 236 1.9 20600	283 52 238 2.0 20600	301 55 240 2.1 20600	316 57 242 2.2 20600	330 60 244 2.2 20600	
82	242 46 238 1.9 19600	282 52 242 2.1 19700	298 55 244 2.2 19700	313 57 246 2.3 19700	326 59 248 2.3 19800		
86	278 52 244 2.3 18400	317 58 248 2.5 18400	332 61 250 2.6 18500	346 63 252 2.6 18500	359 65 254 2.7 18500		
90	300 56 250 2.6 17100	335 61 254 2.7 17200	349 64 256 2.8 17200	363 66 258 2.9 17200			
94	317 59 256 2.8 15900	350 64 260 3.0 15900	363 66 262 3.0 16000	375 67 264 3.1 16000			
CORRECTIONS		DISTANCE		TIME	FUEL	LEVEL OFF	
ENGINE ANTI ICE ON		+ 15 %		+ 12 %	+ 18 %	- 200 FT	
TOTAL ANTI ICE ON		+ 20 %		+ 24 %	+ 33 %	- 700 FT	



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## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)		MACH IAS (KT)	
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.181 .442	1.250 .480	1.319 .507	1.369 .530	1.417 .549	1.472 .571	
	1972 244	1915 241	1856 236	1874 237	1870 236	1875 236	
<b>54</b>	1.199 .454	1.281 .494	1.363 .529	1.411 .548	1.464 .569	1.520 .588	
	2093 251	2047 249	2029 246	2028 246	2032 245	2034 243	
<b>58</b>	1.223 .466	1.310 .506	1.402 .546	1.454 .567	1.510 .587	1.554 .591	
	2224 258	2174 255	2185 255	2190 254	2196 253	2138 244	
<b>62</b>	1.253 .484	1.344 .521	1.441 .562	1.497 .583	1.536 .585	1.568 .551	
	2387 268	2330 263	2343 262	2354 262	2277 252	2121 227	
<b>66</b>	1.278 .495	1.380 .538	1.480 .578	1.534 .595	1.548 .548		
	2519 274	2499 272	2504 270	2503 267	2252 235		
<b>70</b>	1.303 .506	1.412 .552	1.517 .591	1.547 .578			
	2651 280	2651 278	2667 277	2519 260			
<b>74</b>	1.327 .515	1.446 .567	1.549 .600	1.562 .528			
	2785 286	2818 286	2811 281	2482 236			
<b>78</b>	1.359 .531	1.478 .579	1.557 .577				
	2968 295	2979 293	2795 270				
<b>82</b>	1.385 .543	1.510 .592	1.574 .523				
	3124 301	3146 299	2758 243				
<b>86</b>	1.412 .554	1.519 .580					
	3282 308	3163 293					
<b>90</b>	1.440 .567	1.529 .559					
	3449 315	3158 282					
<b>94</b>	1.456 .569	1.549 .512					
	3540 316	3139 258					
ENGINE ANTI ICE ON $\Delta$ FUEL = + 2 %				TOTAL ANTI ICE ON $\Delta$ FUEL = + 4 %			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>4/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

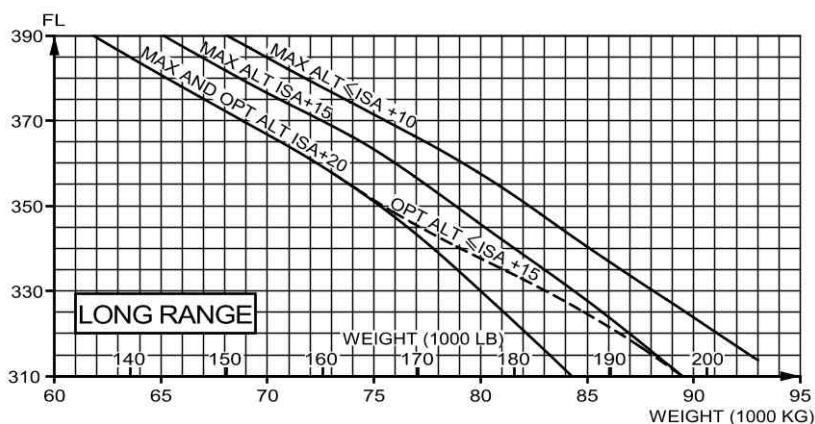
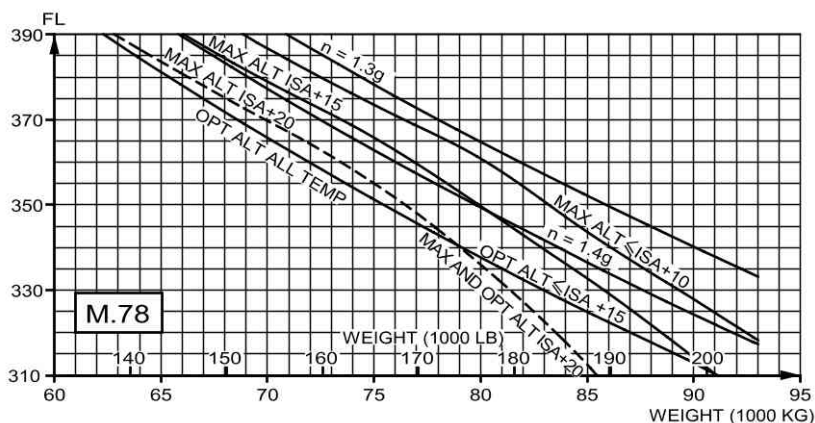
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
							TIME (H.MIN)		
AIR DIST. (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1510 0.46	1317 0.44	1180 0.42	1131 0.41	1083 0.41	1061 0.41	9	7	6
300	2259 1.06	2008 1.03	1826 0.59	1762 0.58	1699 0.57	1670 0.58	15	14	13
400	3004 1.27	2694 1.22	2468 1.17	2388 1.15	2312 1.14	2276 1.15	21	20	20
500	3745 1.47	3377 1.41	3106 1.34	3010 1.32	2921 1.31	2877 1.32	27	27	27
600	4481 2.08	4055 2.00	3739 1.52	3628 1.49	3527 1.48	3475 1.49	34	34	34
700	5212 2.28	4729 2.19	4369 2.10	4241 2.07	4129 2.04	4069 2.05	40	40	41
800	5938 2.49	5400 2.39	4994 2.28	4851 2.24	4727 2.21	4659 2.22	46	47	48
900	6659 3.10	6066 2.58	5615 2.46	5456 2.41	5320 2.38	5247 2.38	52	53	54
1000	7376 3.31	6728 3.17	6232 3.04	6058 2.59	5907 2.55	5831 2.55	58	60	61
1100	8088 3.52	7387 3.37	6845 3.22	6656 3.16	6490 3.12	6413 3.11	63	66	68
1200	8798 4.13	8042 3.56	7454 3.41	7250 3.34	7070 3.29	6991 3.28	69	73	74
1300	9506 4.34	8693 4.16	8059 3.59	7840 3.52	7645 3.46	7566 3.44	75	79	81
1400	10209 4.55	9340 4.36	8661 4.17	8427 4.10	8217 4.03	8137 4.00	81	86	87
ENGINE ANTI ICE ON △FUEL = + 2 %					TOTAL ANTI ICE ON △FUEL = + 4 %				

FLIP23 A321-131 IAE V2530-A5 3610 03301.001011 0250300 .7801 .000100 140 0300350 60 0 100100 40100 18590 CL-N0-04-07-150



## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
≤ISA +10	Max ALT : - 500 ft Opt ALT : - 300 ft	Max ALT : -1 100 ft Opt ALT : - 300 ft
ISA +15	Max ALT : - 700 ft Opt ALT : - 300 ft	Max ALT : -1 500 ft Opt ALT : - 600 ft
ISA +20	Max ALT : -1 000 ft Opt ALT : -1 000 ft	Max ALT : -2 300 ft Opt ALT : -2 300 ft

# IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

**ALL ENGINES**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 – DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 65000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	1037 0.36	978 0.36	926 0.36	880 0.36	842 0.36	816 0.36	1	2	4
400	2281 1.02	2158 1.02	2049 1.02	1956 1.03	1885 1.03	1854 1.03	7	10	20
600	3518 1.27	3329 1.28	3164 1.29	3023 1.29	2918 1.30	2875 1.30	13	18	33
800	4747 1.53	4494 1.54	4271 1.55	4081 1.56	3939 1.56	3882 1.56	19	25	45
1000	5970 2.19	5650 2.20	5370 2.22	5131 2.23	4951 2.23	4874 2.23	25	33	57
1200	7185 2.45	6799 2.47	6461 2.48	6171 2.49	5952 2.50	5852 2.50	31	40	67
1400	8393 3.11	7941 3.13	7544 3.14	7204 3.16	6944 3.17	6816 3.17	36	47	77
1600	9596 3.37	9076 3.39	8620 3.41	8228 3.43	7925 3.44	7768 3.44	41	54	86
1800	10792 4.03	10205 4.05	9689 4.07	9244 4.09	8898 4.10	8707 4.10	46	60	94
2000	11983 4.29	11327 4.31	10751 4.34	10254 4.36	9865 4.37	9640 4.37	51	66	102
2200	13167 4.55	12442 4.58	11806 5.00	11256 5.03	10825 5.04	10566 5.04	56	73	110
2400	14345 5.21	13551 5.24	12855 5.26	12251 5.29	11776 5.31	11482 5.31	61	79	117
2600	15518 5.47	14654 5.50	13897 5.53	13239 5.56	12720 5.58	12388 5.58	65	85	125
2800	16685 6.13	15750 6.16	14932 6.19	14220 6.23	13657 6.24	13286 6.24	68	90	131
3000	17851 6.39	16841 6.42	15961 6.46	15195 6.49	14586 6.51	14175 6.51	72	96	138
ECON AIR CONDITIONING △FUEL = - 0.6 %			ENGINE ANTI ICE ON △FUEL = + 2 %			TOTAL ANTI ICE ON △FUEL = + 5 %			

FLIP22B A321-131 IAE V2530-A53610 03301.300211 0250300 .7800 .000200 140 0300350 65 0 100100 40100 18590
CL-N0-CL-004-009-1E0

# COST INDEX FOR LONG RANGE CRUISE SPEED

**ALL ENGINES**

For a quick determination of the  $CI_{LRC}$ , use:

- $CI_{LRC}$  = 50 kg/min in the FMGC.
- or
- $CI_{LRC}$  = 70 (100 lb/h) in the FMGC.



## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)	60				80				IAS (KT)
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.7	173	100	IDLE					241
370	15.9	166	95	IDLE	18.0	186	108	IDLE	252
350	15.2	159	90	IDLE	17.3	179	103	IDLE	264
330	14.6	153	85	IDLE	16.6	173	98	IDLE	277
310	14.0	148	81	IDLE	16.0	167	93	IDLE	289
290	13.5	143	76	IDLE	15.3	161	88	IDLE	300
270	12.8	137	71	IDLE	14.5	154	81	IDLE	300
250	12.1	131	66	IDLE	13.6	146	75	IDLE	300
240	11.7	127	63	IDLE	13.2	143	72	IDLE	300
220	11.0	121	58	IDLE	12.3	135	66	IDLE	300
200	10.2	114	53	IDLE	11.5	127	60	IDLE	300
180	9.5	108	48	IDLE	10.5	119	54	IDLE	300
160	8.7	100	43	IDLE	9.6	110	48	IDLE	300
140	7.9	93	39	IDLE	8.7	101	42	IDLE	300
120	7.1	85	34	IDLE	7.7	92	37	IDLE	300
100	6.3	76	29	IDLE	6.7	81	31	IDLE	300
50	2.4	30	10	IDLE	2.5	32	11	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		ECON AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		—		+ 1 min		+ 3 min		+ 0.2 %	
FUEL		— 2 %		+ 17 %		+ 90 %		+ 0.7 %	
DISTANCE		—		+ 4 %		+ 20 %		+ 0.4 %	

10B-08FA321-131IAEV2530-A523100000C5KG330001859000-1-350.015.0.00003.780300.000250.0000 FCOM-NO-03-05-30-002-150

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 120 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 100 KG (4MIN)									
REF. LDG WT AT DEST. = 60000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	601 0.12						2		
60	775 0.16						4		
80	950 0.20	898 0.19					5		
100	1124 0.23	1056 0.23	1035 0.22				6	6	
120	1299 0.27	1213 0.26	1172 0.26	1172 0.25			7	7	
140	1474 0.31	1371 0.30	1310 0.29	1294 0.28			8	8	
160	1649 0.35	1529 0.33	1447 0.32	1416 0.31	1423 0.31		9	8	10
180	1825 0.39	1687 0.37	1585 0.35	1539 0.35	1536 0.34	1547 0.33	10	9	12
200	2000 0.43	1845 0.40	1723 0.38	1662 0.38	1650 0.36	1654 0.36	11	10	13
220	2176 0.46	2003 0.44	1860 0.42	1784 0.41	1763 0.39	1761 0.39	12	10	14
240	2352 0.50	2161 0.47	1998 0.45	1907 0.44	1877 0.42	1869 0.41	13	11	15
260	2529 0.54	2320 0.50	2136 0.48	2030 0.47	1991 0.45	1976 0.44	15	12	16
280	2705 0.58	2479 0.54	2274 0.51	2153 0.50	2105 0.48	2084 0.47	16	13	17
300	2882 1.02	2638 0.57	2413 0.54	2277 0.53	2220 0.51	2192 0.50	17	13	18
320	3059 1.05	2797 1.01	2551 0.58	2400 0.57	2334 0.54	2300 0.53	18	14	20
340	3236 1.09	2956 1.04	2689 1.01	2524 1.00	2449 0.57	2408 0.55	19	15	21
360	3414 1.13	3115 1.07	2828 1.04	2647 1.03	2563 1.00	2516 0.58	20	16	22
380	3591 1.17	3275 1.11	2966 1.07	2771 1.06	2678 1.03	2625 1.01	21	16	23
400	3769 1.21	3435 1.14	3105 1.10	2895 1.09	2793 1.06	2733 1.04	22	17	24
420	3947 1.24	3594 1.18	3243 1.14	3019 1.12	2908 1.09	2842 1.06	23	18	25
440	4125 1.28	3754 1.21	3382 1.17	3143 1.15	3023 1.12	2951 1.09	25	19	26
460	4304 1.32	3915 1.24	3521 1.20	3267 1.18	3138 1.15	3060 1.12	26	20	27
480	4482 1.35	4075 1.28	3660 1.23	3392 1.21	3253 1.18	3169 1.15	27	20	28
500	4661 1.39	4235 1.31	3799 1.26	3516 1.25	3369 1.21	3278 1.18	28	21	30
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 4 %			ΔFUEL = + 6 %			

CL-W0-04-13-155



# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 140 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING ANTI-ICING OFF		ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	65	70	75	80	85	90	95
40	337 0.15	339 0.15	342 0.15	347 0.15	353 0.15	361 0.15	370 0.15
60	515 0.18	523 0.18	531 0.18	540 0.18	551 0.18	561 0.18	571 0.18
80	693 0.22	706 0.22	719 0.21	733 0.21	748 0.21	761 0.21	773 0.21
100	871 0.26	890 0.25	908 0.25	926 0.24	945 0.24	960 0.24	975 0.24
120	1048 0.30	1073 0.29	1096 0.28	1119 0.28	1141 0.27	1160 0.27	1176 0.27
140	1226 0.33	1256 0.32	1284 0.31	1312 0.31	1338 0.30	1359 0.30	1378 0.30
160	1403 0.37	1438 0.36	1472 0.35	1504 0.34	1534 0.33	1559 0.33	1580 0.33
180	1580 0.41	1621 0.39	1659 0.38	1696 0.37	1731 0.36	1758 0.36	1782 0.36
200	1757 0.45	1803 0.43	1846 0.42	1888 0.41	1927 0.39	1957 0.39	1984 0.39
220	1933 0.48	1985 0.46	2034 0.45	2080 0.44	2123 0.43	2156 0.42	2185 0.42
240	2110 0.52	2167 0.50	2221 0.48	2271 0.47	2319 0.46	2355 0.45	2387 0.45
260	2286 0.56	2349 0.53	2407 0.52	2463 0.51	2515 0.49	2554 0.48	2589 0.48
280	2462 1.00	2530 0.57	2594 0.55	2654 0.54	2710 0.52	2753 0.51	2791 0.51
300	2637 1.04	2711 1.00	2780 0.58	2845 0.57	2906 0.55	2952 0.54	2993 0.54
320	2813 1.07	2892 1.04	2967 1.02	3036 1.00	3101 0.59	3150 0.57	3195 0.57
340	2988 1.11	3073 1.07	3153 1.05	3227 1.04	3296 1.02	3349 1.00	3397 1.00
360	3164 1.15	3254 1.11	3339 1.09	3417 1.07	3491 1.05	3547 1.03	3599 1.03
380	3339 1.19	3434 1.15	3524 1.12	3608 1.10	3686 1.08	3745 1.05	3800 1.05
400	3513 1.23	3615 1.18	3710 1.15	3798 1.14	3881 1.12	3943 1.08	4001 1.08
420	3688 1.26	3795 1.22	3895 1.19	3988 1.17	4076 1.15	4141 1.11	4202 1.11
440	3862 1.30	3975 1.25	4080 1.22	4177 1.20	4270 1.18	4339 1.14	4402 1.14
460	4037 1.34	4154 1.29	4265 1.26	4367 1.24	4465 1.22	4537 1.17	4603 1.17
480	4211 1.38	4334 1.33	4450 1.29	4557 1.27	4659 1.25	4735 1.20	4803 1.20
500	4384 1.42	4513 1.36	4635 1.33	4746 1.30	4853 1.28	4932 1.23	5003 1.23
520	4558 1.46	4692 1.40	4819 1.36	4935 1.34	5047 1.32	5130 1.26	5203 1.26
540	4732 1.49	4871 1.43	5003 1.40	5124 1.37	5241 1.35	5327 1.29	5403 1.29
AIR CONDITIONING OFF ΔFUEL = - 2 %			ENGINE ANTI ICE ON ΔFUEL = + 3 %		TOTAL ANTI ICE ON ΔFUEL = + 5 %		

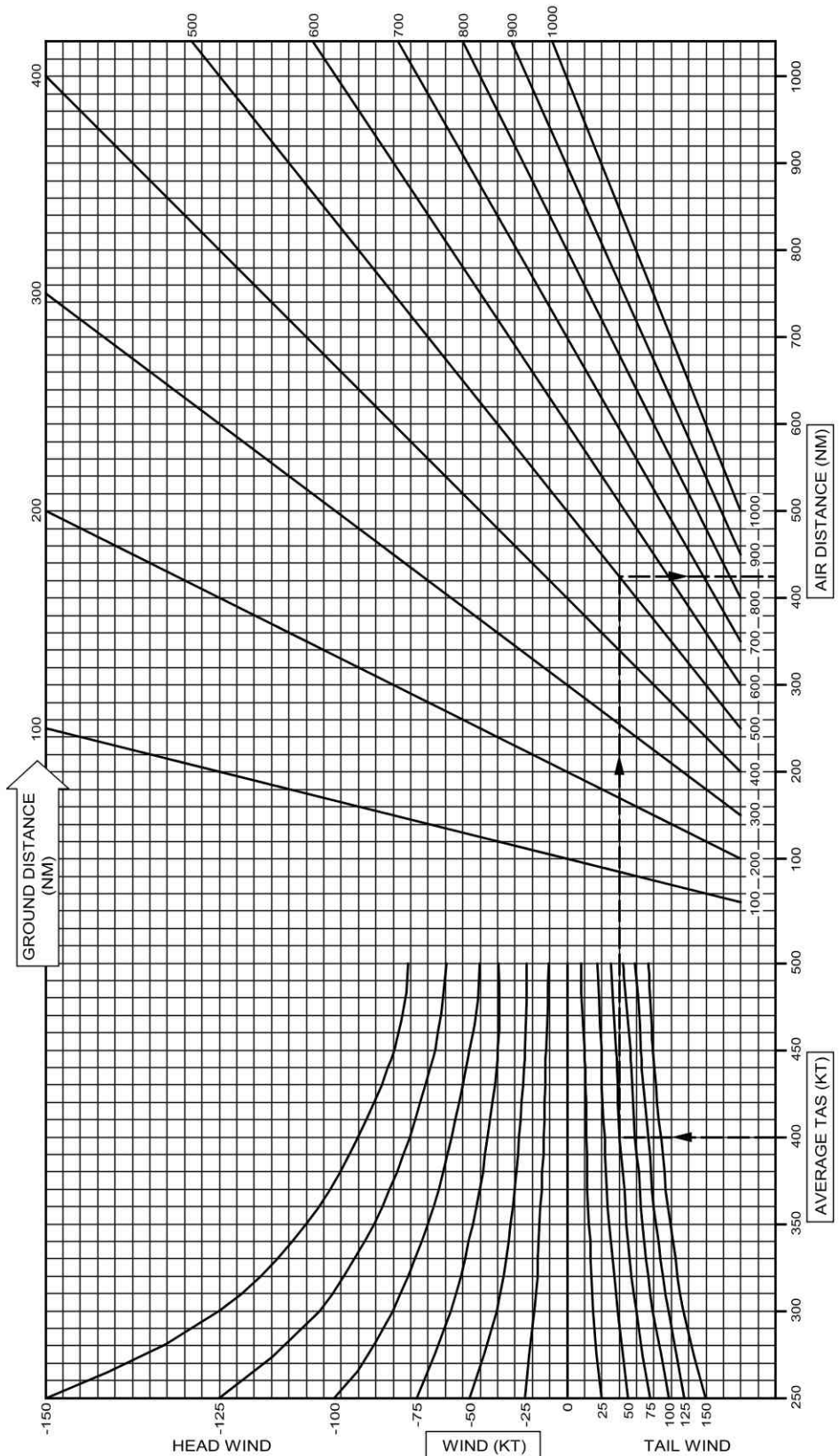
 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	IN FLIGHT PERFORMANCE	FPE-CAB <b>2/2</b>
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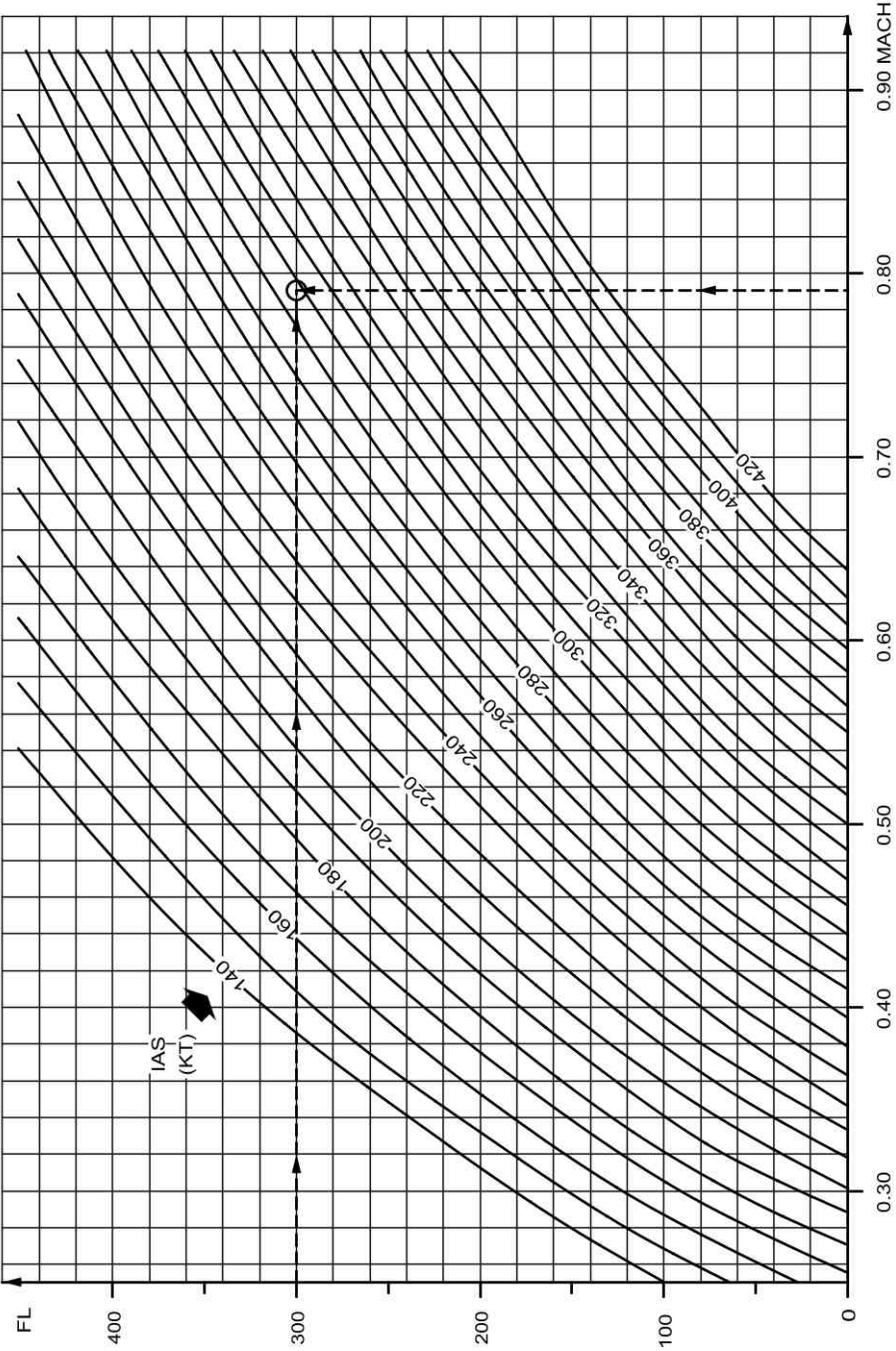




## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: *In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEI condition). The flight crew must still compute and monitor the actual fuel consumption.*

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: *Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:*

- *Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or*
- *If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.*

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

FPF (HYD G SYS LO PR) = 10 %

FPF (INOP SYS: L AIL) = 8 %

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x (10 % + 8 %)

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x 8 %

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

## FUEL PENALTY FACTORS/INOP SYS TABLE

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
<b>F/CTL</b>	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
<b>L/G</b>	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)										
		54	58	62	66	70	74	78	82	86	90	94
		N1 %										
390	0.76	79.4	80.6	-	-	-	-	-	-	-	-	-
370	0.76	77.9	78.9	80.0	81.2	-	-	-	-	-	-	-
350	0.76	77.2	77.9	78.8	79.7	80.7	-	-	-	-	-	-
330	0.76	76.9	77.6	78.2	79.0	79.8	80.7	81.6	-	-	-	-
310	0.76	76.7	77.3	77.9	78.5	79.2	79.9	80.6	81.5	82.4	-	-
290	0.76	76.7	77.2	77.7	78.2	78.8	79.4	80.0	80.6	81.4	82.1	83.0
270	300	76.2	76.6	77.0	77.5	78.0	78.5	79.1	79.6	80.3	80.9	81.6
250	300	75.0	75.4	75.8	76.2	76.7	77.1	77.7	78.2	78.9	79.5	80.2
200	300	72.2	72.5	72.9	73.3	73.7	74.2	74.7	75.2	75.8	76.4	77.0
150	270	65.5	65.9	66.5	67.0	67.7	68.4	69.2	70.3	71.0	71.8	72.6
100	270	62.5	62.9	63.5	64.0	64.6	65.3	66.0	66.8	67.6	68.4	69.2
50	270	59.1	59.5	60.0	60.5	61.1	61.8	62.6	63.4	64.2	65.0	65.7

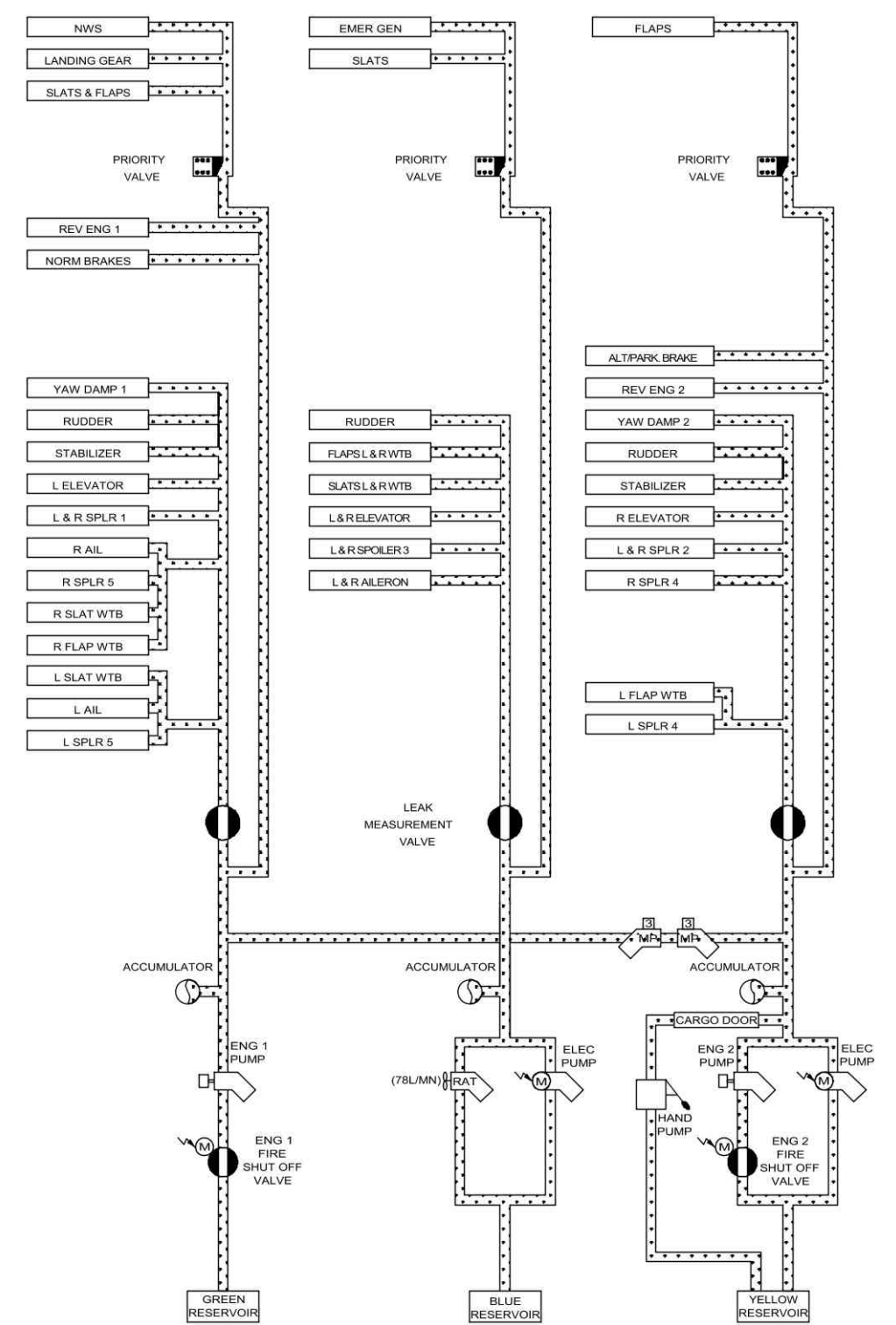
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

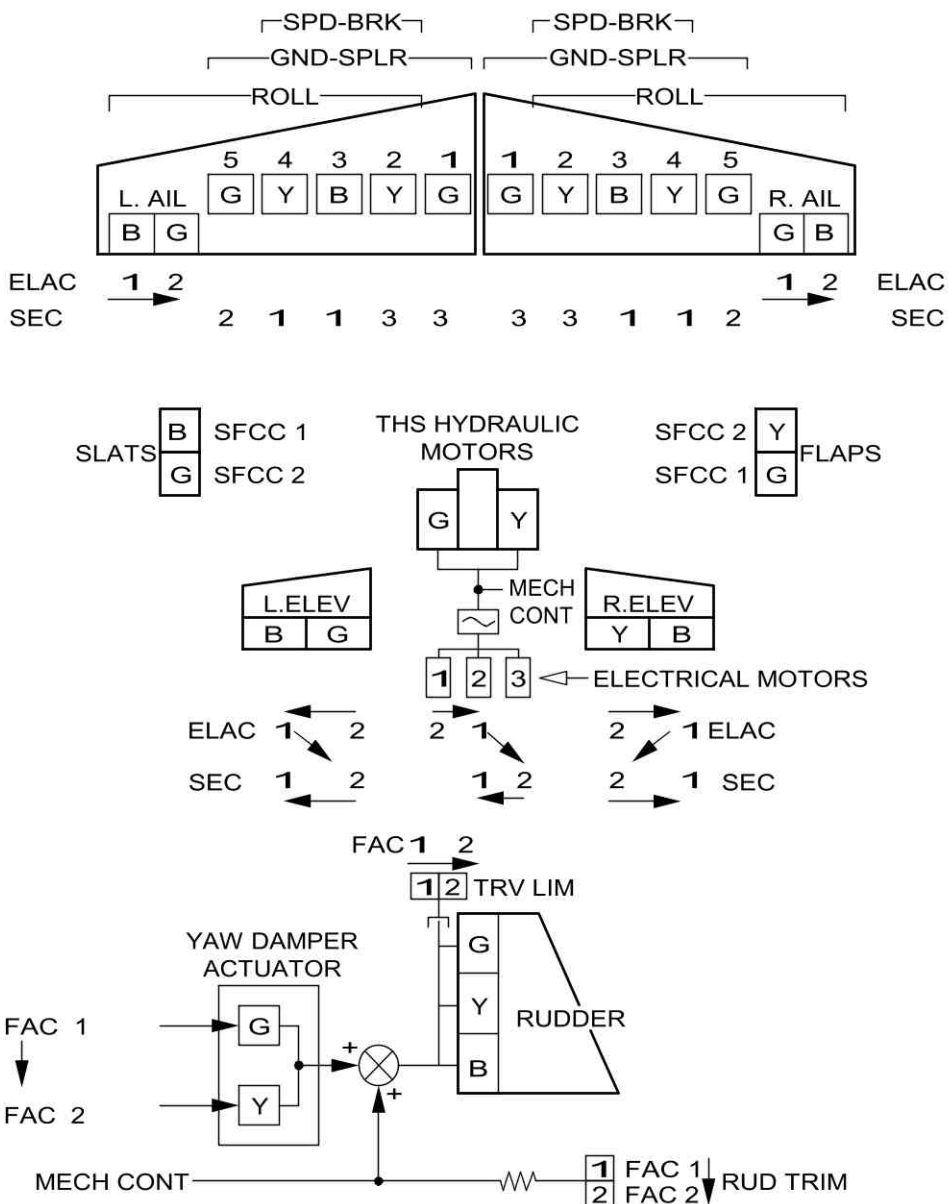
A/THR in managed speed.....USE

HYDRAULIC ARCHITECTURE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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**OEBPROC-11 "ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight**

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**"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight.. 11.01**

**OEBPROC-30 No SRS Engagement During Go Around Below MDA**

**No SRS Engagement During Go Around Below MDA..... 30.00**  
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**OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

**Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....31.00**  
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**OEBPROC-38 Erroneous Radio Altimeter Height Indication**

**Erroneous Radio Altimeter Height Indication..... 38.00**  
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**OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**


**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.00**  
**AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....40.01**

**OEBPROC-43 F/CTL SPOILER FAULT**

**F/CTL SPOILER FAULT..... 43.00**  
**F/CTL SPOILER FAULT..... 43.01**

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

**L/G GEAR NOT DOWNLOCKED..... 44.00**  
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## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an **ENG 1(2) OIL FILTER CLOG** ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTF					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTF					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB30 Issue 1.0

# NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 188.

One Operator reported a case where the flight crew initiated a Go Around slightly below the Minimum Descent Altitude (MDA), and the aircraft did not pitch up as expected. The flight crew performed a non precision approach (a VORDME approach) using the FINAL APP managed guidance mode with the AP1 (Autopilot) engaged during the final approach.

This OEB is issued to provide flight crews with an operational procedure to avoid such aircraft behavior.

The operational procedure provided in this OEB applies to all Non Precision Approaches, for both conventional approaches and RNAV approaches, flown in FINAL APP managed guidance mode.

**Applicable to:**

All A318/A319/A320/A321 aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013526.0002001	30 MAR 12
Criteria: SA Applicable to: B-HTF					
	OEBPROC-30		No SRS Engagement During Go Around Below MDA	00013527.0002001	30 MAR 12
Criteria: SA Applicable to: B-HTF					





## NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

### ECAM ENTRY

None

### PROCEDURE

During a non precision approach, when using the FINAL APP managed guidance mode:

- **At DA(DH) or MDA(MDH), or earlier in approach if visual conditions are obtained:**

DISENGAGE the FINAL APP mode by pressing the APPR pushbutton on the FCU.

When the flight crew presses the APPR pb in order to disengage the FINAL APP managed guidance mode, a basic vertical guidance mode, either V/S or FPA, engages.

This ensures that the SRS and GA TRK guidance modes correctly engage, if the flight crew initiates a go-around slightly below MDA (MDH).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HTF				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HTF				



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTF				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTF				





## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTF				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTF				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



<b>AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)</b>
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- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
PACK (affected bleed side).....OFF

X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>OPERATIONS ENGINEERING BULLETINS</b>	<b>43.00</b> 30 MAR 12
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## OEB43 Issue 2.0

### F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTF				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTF				





## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTF				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTF				

L/G GEAR NOT DOWNLOCKED

ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

L/G GEAR NOT DOWNLOCKED	
<i>This warning appears, if the landing gear sequence is not completed after 30 seconds.</i>	
L/G lever.....	RECYCLE
•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:	
L/G GRAVITY EXTENSION PROC.....	APPLY
STATUS	
The status displayed on the ECAM is correct.	

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	<b>BLANK</b>
		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HTG**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HTG</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HTG</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HTG</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HTG</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HTG</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HTG</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HTG</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HTG</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HTG</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	1695	HDA 0104	B-HTG	321-231

(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	K2113		30 AUG 10	FUSELAGE - REAR FUSELAGE SECTION 16A - DEFINE A321 BASIC STRUCTURE
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>2/6</b>
		30 MAR 12


M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	<b>Applicable to: ALL</b>			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	<b>Applicable to: ALL</b>			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	<b>Applicable to: ALL</b>			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	<b>Applicable to: ALL</b>			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	<b>Applicable to: ALL</b>			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	<b>Applicable to: ALL</b>			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	<b>Applicable to: ALL</b>			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+)- STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	<b>Applicable to: ALL</b>			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	<b>Applicable to: ALL</b>			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	<b>Applicable to: ALL</b>			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	<b>Applicable to: ALL</b>			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	<b>Applicable to: ALL</b>			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	<b>Applicable to: ALL</b>			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			



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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P1872		30 AUG 10	AIR CONDITIONING - INSTALL CIRCUIT BREAKER FOR REAR CARGO COMPT VALVES FOR EROPS -
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	P3341		30 AUG 10	LANDING GEAR - WHEELS AND BRAKES - INSTALLATION OF MESSIER GOODRICH WHEELS AND BRAKES ON A321
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	J2153		30 AUG 10	FUEL-CERTIFICATION OF FUEL SYSTEM- (LOW PRESSURE SYSTEM) FOR THE OPERATION 0 TO 2 ACTS
	<b>Applicable to: ALL</b>			

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	Applicable to: ALL			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	Applicable to: ALL			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	Applicable to: ALL			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	Applicable to: ALL			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	Applicable to: ALL			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	Applicable to: ALL			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	Applicable to: ALL			
	32-1369 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INTRODUCE BSCU STD 10.1 - SB ONLY.
	Applicable to: ALL			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	Applicable to: ALL			
	K0070		30 AUG 10	AIR CONDITIONING - CARGO COMPARTMENT - VENTILATION - INSTALL SYSTEM IN AFT COMPARTMENT -
	Applicable to: ALL			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	Applicable to: ALL			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	Applicable to: ALL			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	Applicable to: ALL			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	Applicable to: ALL			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	Applicable to: ALL			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	Applicable to: ALL			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	<b>Applicable to: ALL</b>			
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	<b>Applicable to: ALL</b>			
	K7727		30 AUG 10	EQUIPMENT/FURNISHINGS - MISCELLANEOUS EMERGENCY EQPT - INSTALL AN HONEYWELL ELT WITH CONTROL PANEL IN COCKPIT
	<b>Applicable to: ALL</b>			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : Index of the back cover page interior                                                                                           |
| C3              | : Index of the back cover page exterior                                                                                           |
| "BLANK"         | : Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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**LOW ENERGY WARNING.....22.02**

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**ELEC EMER CONFIG Summary.....24.02**

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## CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

**LAND ASAP**

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

**CAUTION**

Check that  $\Delta P$  is zero before opening the doors.

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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.


Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>				
<b>ELEC EMER CONFIG SYS REMAINING</b>		<b>EMER GEN RUNNING</b>	<b>BAT ONLY</b>	
			<b>IN FLIGHT</b>	<b>ON THE GROUND</b>
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
	AFT CRG ISOL VALVE	Norm	Inop	Inop
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1+ N° 2	N°1+ N°2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



*Continued from the previous page*

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

<sup>(a)</sup> Restored, when speed is below 100 kt.

<sup>(b)</sup> Crew oxygen valve inoperative.

<sup>(c)</sup> Lost, when speed is below 50 kt.


<sup>(d)</sup> Lost 30 s after last engine shutdown.

<sup>(e)</sup> IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

<sup>(f)</sup> For APU start only.

<sup>(g)</sup> Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.



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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK USABLE BY GRAVITY (2T UNUSABLE) <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	52	56	60	64	68	72	76	80	84	88	92	94
<b>VREF = VLS CONF FULL</b>	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV										
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94
DRY runway	2 260	2 340	2 450	2 560	2 670	2 810	2 970	3 550	3 800	4 050
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.20									
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.95									
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind				
DRY Runway	+3 %					+16 %				

The method for approach speed computation is given in the QRH ABN 80 (*Refer to VAPP Calculation*).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● If one or more electrical latches (strikes) are faulty:

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● If two pressure sensors are faulty:

Automatic latch release is not available, in case of cockpit decompression.

● If no LED on the CKPT DOOR CONT panel is on:

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT.....

ON
- If fuel vapors:

CAB FANS.....

ON

PACK 1+2.....

OFF
- If no fuel vapors:

CAB FANS.....

OFF

ECON FLOW.....

OFF
- LDG ELEV.....

10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude).....

INITIATE
- ATC.....

NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC.....

CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*
- At FL 100 or MEA

APU MASTER SW (if in ELEC EMER CONF).....

ON

PACK 1+2.....

OFF

MODE SEL.....

MAN

MAN V/S CTL.....

FULL UP

RAM AIR.....

ON

APU MASTER SW.....

OFF
- If smoke persists, open CKPT window:

MAX SPEED.....

200 KT

COCKPIT DOOR.....

OPEN

HEADSETS.....

ON

PNF COCKPIT WINDOW.....

OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE



## SMOKE/FUMES/AVNCS SMOKE

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

● **IF REQUIRED:**

CREW OXY MASKS..... ON/100%/EMERG

● **IF SMOKE SOURCE IMMEDIATELY OBVIOUS,  
ACCESSIBLE, AND EXTINGUISHABLE:**

FAULTY EQPT..... ISOLATE

● **IF SMOKE SOURCE NOT IMMEDIATELY  
ISOLATE:**

DIVERSION..... INITIATE

DESCENT (FL 100, or MEA, or minimum obstacle  
clearance altitude)..... INITIATE

● **AT ANY TIME of the procedure, if SMOKE/FUMES  
becomes the GREATEST THREAT :**

SMOKE/FUMES REMOVAL..... CONSIDER

ELEC EMER CONFIG..... CONSIDER

*Refer to the end of the procedure to Set ELEC  
EMER CONFIG*

● **At ANY TIME of the procedure, if situation  
becomes UNMANAGEABLE :**

IMMEDIATE LANDING..... CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

● **IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
BLOWER..... AUTO  
EXTRACT..... AUTO  
CARGO AFT ISOL VALVE..... OFF  
PACK 1..... OFF

● **If smoke continues:**

PACK 1..... ON  
PACK 2..... OFF

● **If smoke still continues:**

PACK 2..... ON  
BLOWER..... OVRD  
EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

● **IF CAB EQUIPMENT SMOKE SUSPECTED:**

● **If smoke continues:**

EMER EXIT LIGHT..... ON  
COMMERCIAL..... OFF  
SMOKE DISSIPATION..... CHECK  
FAULTY EQPT..... SEARCH/ISOLATE

● **If smoke still continues or if faulty  
equipment confirmed isolated:**

COMMERCIAL..... NORM

SMOKE/FUMES REMOVAL..... CONSIDER







## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

- **WHEN EMER GEN AVAIL:**

APU GEN.....OFF  
GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- **AT 3 min OR 2 000 ft AAL BEFORE LANDING:**

GEN 2..... ON  
EMER ELEC GEN 1 LINE.....ON

- **WHEN A/C IS STOPPED:**

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

● If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


- Note:
- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
  - In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED

Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	215 kt	195 kt	190 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	215 kt		215 kt	195 kt	190 kt	
S > 3	190 kt		190 kt	190 kt	190 kt	

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM

CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

**STABILIZER JAM**

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

**● IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

**● IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP



FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

CAUTION	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
---------	-------------------------------------------------------------------------------------------------------------------------------------------

FUEL X FEED..... ON  
CTR TK L+R XFR..... OFF

- On the lighter side:  
FUEL PUMPS.....OFF
- When fuel is balanced:  
FUEL PUMPS..... ON  
CTR TK L+R XFR..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- A tank is overflowing (due to pipe rupture in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each wing tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK L+R XFR..... OFF

*Each engine is fed via its associated wing tank only.*

WING TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each wing tank.*

#### ■ CASE 1 : IF ONE WING TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the wing tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

CTR TK L+R XFR..... ON  
 FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The wing tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



FUEL LEAK (Cont'd)

ENGINE RESTART..... CONSIDER  
CTR TK XFR (non-leaking side)..... ON

CAUTION	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
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■ CASE 2 : IF BOTH WING TANKS DEplete AT A SIMILAR RATE:

A leak from the Center tank or the APU feeding line may be suspected.

● If fuel smell in the cabin:

APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*

● When fuel quantity in one wing tank is less than 3 t (6 600 lb ):

CTR TK L+R XFR..... ON

FOR LANDING

CAUTION	Do not use reversers.
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GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :


FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):


BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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**ACT UNUSABLE PROC**

ACT..... AUTO  
*This stops the pump dry running.*

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## HYD B + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/.77  
 MANEUVER WITH CARE  
 Flight controls remain in normal law.

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR

W (1 000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW/FLAPS SLOW  
 GPWS LDG FLAP 3..... ON  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE** Only one ELEV and two spoilers per wing  
**SPOILERS** Only 2 per wing  
**REVERSER** Only N°1  
**BRAKING** NORMAL  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>										
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94
<b>DRY runway</b>	1 400	1 450	1 520	1 590	1 650	1 740	1 840	2 200	2 350	2 500
<b>WET runway</b>	1 880	1 980	2 090	2 220	2 330	2 450	2 580	2 780	2 960	3 100
<b>CONTA runway</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75									

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 16 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
DRY runway	1 520	1 580	1 650	1 730	1 800	1 890	2 000	2 390	2 560	2 720	
WET runway	2 030	2 150	2 270	2 400	2 520	2 660	2 790	3 010	3 200	3 360	
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.80										

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 16 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/0.77  
 MANEUVER WITH CARE  
 ALTN LAW : PROT LOST

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 30 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW / FLAPS JAMMED  
 GPWS FLAP MODE..... OFF  
 ● **For Flaps extension:**  
 SPD SEL..... VFE NEXT - 5KT  
 When in landing CONF : DECELERATE TO CALCULATED VAPP  
 Stabilize at VAPP before L/G down, to be trimmed for approach.  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE:** PITCH AUTHORITY REDUCED (No stabilizer).  
 MAN TRIM Unusable  
 Only 1 spoiler per wing – Direct law  
**SPOILERS:** Only 1 per wing  
**NO REVERSER**  
**BRAKING:** BRK Y ACCU PR ONLY (7 applications)  
 MAX BRK PR 1 000 PSI  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption  
 ● **For circuit:**  
 MAINTAIN SLATS/FLAPS CONFIGURATION  
 Recommended speed: MAX SPD - 10 kt  
 ● **For diversion:**  
 ● **If Flaps at zero:**  
 SELECT CLEAN CONFIGURATION  
 Normal operating speeds  
 ● **If Flaps not at zero:**  
 MAINTAIN SLATS/FLAPS CONFIG  
 Recommended speed: MAX SPD - 10 kt

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
<b>DRY runway</b>	2 050	2 130	2 230	2 330	2 430	2 550	2 700	3 230	3 450	3 680	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.05										
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.00										
<b>CORRECTIONS</b>	+ 1 000 ft above SL					+ 10 kt tailwind					
<b>DRY runway</b>	+ 3 %					+ 16 %					

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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DOUBLE AOA HEAT FAILURE

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*





## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

## LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <b>L/G GEAR NOT DOWN</b> ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOMELT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.



LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE


- **If NOSE L/G abnormal:**  
 NOSE..... MAINTAIN UP  
*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*  
 BRAKES (compatible with elevator efficiency)..... APPLY  
 ENG MASTERS..... OFF  
*Shutdown the engines before nose impact.*

- **If one MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*At touchdown, shut down both engines.*  
 FAILURE SIDE WING..... MAINTAIN UP  
*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*  
 DIRECTIONAL CONTROL..... MAINTAIN  
*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

- **If both MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*Shut down the engines in the flare, before touchdown.*  
 PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

**WHEN A/C STOPPED**

ENG (all) and APU FIRE pushbutton..... PUSH  
*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*  
 ENG (all) and APU AGENT..... DISCH

- **If Evacuation required:**  
 EVACUATION..... INITIATE  
 - All emergency and passenger doors may be used to evacuate the aircraft.  
 - Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

- **If Evacuation not required:**  
 CABIN CREW and PASSENGERS (PA)..... NOTIFY  
*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

#### **F/CTL ALTN LAW**

#### **(PROT LOST)**

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

#### **APPR PROC:**

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### ● **FOR L/G GRVTY EXTN (not on the ECAM):**

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### **INOP SYS**

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### **Other INOP SYS**

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT




ADR 1 + 2 + 3 FAULT (Cont'd)

- DURING FINAL APPR  
V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*

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## NAV FM / GPS POS DISAGREE

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 °,
- 0.9 min for latitudes at or above 55 ° and below 70 °,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

- The following procedure is not displayed on the ECAM:
- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.
  - **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.
    - **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
    - **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
  - **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.  
During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

■ **MCDU INITIALIZATION:**

- DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*
- IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*
- A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*

■ **CDU INITIALIZATION:**

- Depending on the CDU keyboard installed, an “H” may be written on the “5” key:
- **If “H” is written on the “5” key:**
- H KEY.....PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*
- A/C HEADING..... ENTER
- **If “H” is not written on the “5” key:**
- A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG–ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 81 t	81 t-68 t	Below 68 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	4.0/70.7	4.0/66.4	4.0/61.5
2	F	7.0/68.9	7.0/64.6	7.0/59.9
1 + F	S	3.5/67.6	3.0/63.8	3.0/58.6
1	S	7.5/65.5	7.5/61.4	7.5/56.5
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200 -FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.





## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR..... KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF..... USE FLAP 3

APP SPD..... VLS +10

LDG DIST PROC..... APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST..... CLB

FLAPS..... RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	270 kt	8.5/CLB	9.0/CLB	10.0/CLB
FL 50 - FL 100		8.0/CLB	8.0/CLB	9.0/CLB
FL 100 - FL 150		7.0/CLB	7.0/CLB	8.0/CLB
FL 150 - FL 200		6.0/CLB	6.0/CLB	6.5/CLB
FL 200 - FL 250	300 kt	4.0/CLB	4.0/CLB	4.0/CLB
FL 250 - FL 280		3.5/CLB	3.0/CLB	3.0/CLB
Above FL 280	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200-FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 280	M 0.76	-1.0/IDLE	-1.5/IDLE	-2.0/IDLE
FL 280-FL 200	300 kt	-0.5/IDLE	-1.5/IDLE	-2.5/IDLE
FL 200 - FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-1.5/IDLE
Below FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-2.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.0/IDLE	2.0/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.0/63.4	5.0/59.4	5.0/54.6
1	S	7.5/65.6	7.5/61.4	7.5/56.6
1+F <sup>(1)</sup>	S	3.5/67.6	3.0/63.8	3.0/58.6
2	F	7.0/68.5	7.0/64.7	7.0/59.9



<b>UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)</b>
----------------------------------------------------------------

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	4.0/74.8	4.0/71.0	4.0/65.8

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

<b>FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH</b>
-------------------------------------------------------------

LANDING GEAR DOWN				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	2.0/60.0	2.0/56.0	1.5/51.6

**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



**AIR DUAL BLEED FAULT (Cont'd)**

- If engine bleed recovery was not successful, or if one pack is inoperative :  
X BLEED..... CHECK OPEN  
DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
APU BLEED..... ON  
MAX FL200  
AVOID ICING CONDITIONS
- IF ICE ACCRETION  
APPR SPD.....VLS + 10 KT  
LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 60 000 kg/132 000 lb	-2.5
70 000 kg/154 000 lb	-1.5
80 000 kg/176 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.4 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**

CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**

APU (IF AVAIL).....START

● **WHEN BELOW FL 200**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
94	251	261	271
92	248	258	268
88	242	252	262
86	239	249	259
84	236	246	256
82	233	243	253
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 700 ft/min

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 and L/G DOWN) will be approximately 1.1 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH  
FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.  
MIN APPR SPEED.....160 KT





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE

*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**

- **When in CONF 3 and VAPP:**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN

*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*

- **When L/G downlocked**

L/G lever..... DOWN

APPROACH SPEED..... ADJUST

*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*

GND SPLR..... ARM

MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**

PARKING BRK..... ON

ATC..... NOTIFY

FIRE pushbutton (ENG and APU)..... PUSH

AGENTS (ENG and APU)..... DISCH

*Engine Agent 2 is not available.*

- **If Evacuation required:**

EVACUATION..... INITIATE

ELT  ..... CHECK EMITTING

*If not, switch on the transmitter.*

- **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.*  
*If that causes a strong crosswind, ditch into the wind.*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING

ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*

ENG DUAL FAILURE - NO FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON THRUST LEVERS..... IDLE FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....240 KT/GREEN DOT


*Initially, fly 240 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 700 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE ATC..... NOTIFY CREW OXY MASKS (Above FL 100)..... ON CABIN AND COCKPIT..... PREPARE SIGNS..... ON COMMERCIAL..... OFF

USE RUDDER WITH CARE

● **WHEN BELOW FL 150**

RAM AIR..... ON

COMMON ACTIONS FOR THE APPROACH

APPROACH PREPARATION

*Note: Final descent slope, when configured (CONF 3; L/G DOWN), will be approximately 1.1 N/m per 1 000 ft (with no wind).*

BARO..... SET CREW MASKS/OXY SUPPLY (below FL 100)..... OFF



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt.*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)
  - When in CONF 3 and VAPP  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - When L/G downlocked  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*  
  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

AT 2 000 FT AGL

CABIN.....NOTIFY FOR LANDING


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

AFTER LANDING

- When the aircraft has stopped :  
PARKING BRK.....ON  
ATC.....NOTIFY
  - If Evacuation required :  
EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - If Evacuation not required :  
CABIN CREW and PASSENGERS (PA).....NOTIFY



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell*  
*If that causes a strong crosswind, ditch into the wind..*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF

AFTER DITCHING

ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

## ENG RELIGHT (IN FLIGHT)

- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*

*Engine light up should be achieved within 30 s after fuel flow increases.*

- **When idle is reached:**

ENG MODE SEL.....	NORM
TCAS MODE SEL  .....	check TA/RA

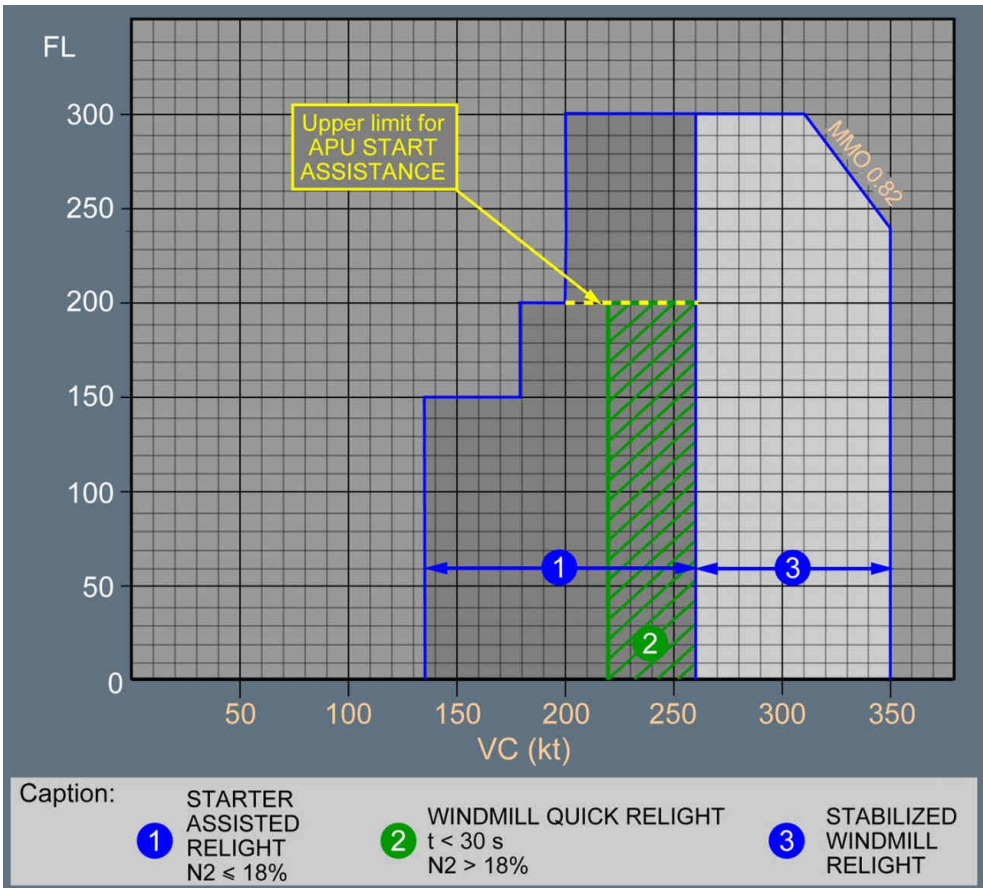
*Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*

Affected SYS.....	RESTORE
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- **If no relight:**

ENG MASTER (affected).....	OFF
----------------------------	-----

*Wait 30 s before attempting a new start (to drain the engine).*





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
---------	---------------------------------------------------------------------------------------------------------------------------------------------

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

- When burning has stopped :  
MAN START.....OFF  
ENG MODE SEL..... NORM





## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1  $\geq$  5 units, N2  $\geq$  5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	76	74	71	68	64	61	58	54
5	76	74	71	68	64	61	56	52
10	76	74	71	68	64	59	54	
15	76	74	71	67	61	57	52	
20	76	74	69	64	59	54		
25	76	71	66	61	56			
30	73	68	64	59	54			
35	69	65	61	57	52			
40	66	62	59	55				
45	63	60	57					
50	60	57						
55	57							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### **COCKPIT PROCEDURES**

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

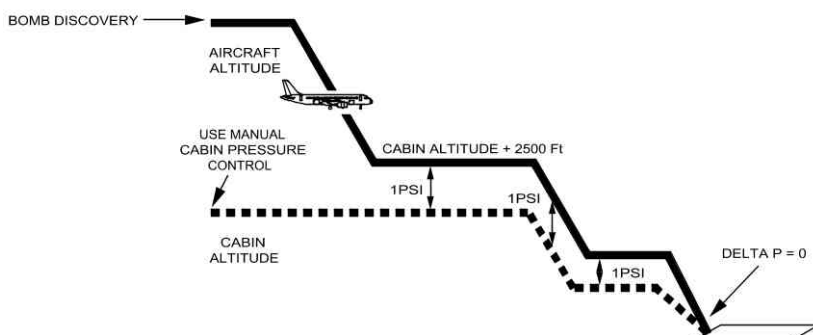
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE
<i>Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.</i>	
NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN
<i>Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.</i>	
DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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BOMB ON BOARD (Cont'd)

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

*The cabin crews must command passengers to switch off all portable electronic devices.*

BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

● If the bomb can be moved:

RH AFT CABIN DOOR SLIDE..... DISARM

LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

CAUTION

DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

BOMB INDICATION LINE..... POSITION

*Note:* *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

BOMB..... MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

CAUTION

Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.



**BOMB ON BOARD (Cont'd)**

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE  
*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

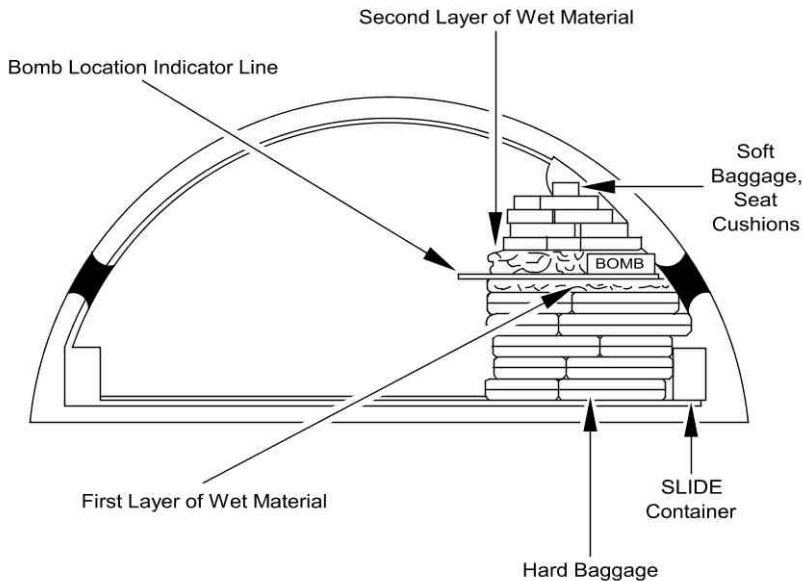
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

LRBL STACK




PASSENGERS.....MOVE/ADVISE  
*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW  
*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
<i>Evacuate through normal and emergency exits on the opposite side of the “bomb” location. Do not use the door just opposite the “bomb”.</i>		
<i>Use all available airport facilities to disembark without delay.</i>		





## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### PREPARATION

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### APPROACH

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### AT 2 000 FT AGL

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### AFTER DITCHING

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT.....ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### **● When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1)..... NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### **■ If Evacuation required:**

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)

ELT..... CHECK EMITTING  
*If not, switch on the transmitter.*

■ If Evacuation not required:

CABIN CREW and PASSENGERS (PA)..... NOTIFY

## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


### WHEN DESCENT ESTABLISHED

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

**CAUTION** Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: The recommendation is to descend with the autopilot engaged.  
 Use of the autopilot is also permitted in EXPEDITE mode .

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.

OVERWEIGHT LANDING

LDG CONF..... AS REQUIRED

*Use the ECAM flap setting, if required for abnormal operations. In all other cases :*

- *FULL is preferred for optimized landing performance*
  - *If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.*
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.*

Note:     *At very high weights, VFE CONF1 is close to VLS clean. To select CONF1, deselect A/THR, decelerate to (or slightly below) VLS and select CONF1 when below VFE. When established at CONF1, the crew can re-engage the A/THR and use managed speed again*

LDG DIST.....CHECK

PACK 1 and 2.....OFF or supplied by APU

*Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.*

● **In the final approach stages**

TARGET SPEED..... VLS

*Reduce the selected speed on the FCU to reach VLS at runway threshold.*

*Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).*

● **At main landing gear touchdown**

REVERSE THRUST..... USE MAX AVAILABLE

● **After nosewheel touchdown**

BRAKES.....APPLY AS NECESSARY

*Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.*

● **Landing complete**

BRAKE FANS  ..... ON

*Be prepared for tire deflation, if temperatures exceed 800 °C.*

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	92	88	82	76	70	65	60	55
15	92	88	82	76	70	65	60	55
20	92	88	82	76	70	65	60	55
25	92	87	80	75	69	64	59	
30	92	85	79	73	68			
35	88	82	76	70	65			
40	85	79	73	68				
45	82	75	70					
50	78	72						
55								

# STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**  
*This will reduce angle of attack*

*Note: In case of lack of pitch down authority, reducing thrust may be necessary.*

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

*Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

**SPEEDBRAKES..... CHECK RETRACTED**  
**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

*Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

# STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**  
**BANK..... WINGS LEVEL**

*Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.*

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- If the aircraft enters a volcanic ash cloud:
 

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
ECON FLOW.....	OFF

*Note:* If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

If airspeed is unreliable or lost, Refer to the QRH ABN 34 Unreliable Speed Indication / ADR Check Proc procedure.

*Note:* If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

*Note:* If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

Due to the increased noise level, pay particular attention to visual warnings.





## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.





## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*

Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

**WINDSHIELD/WINDOW ARCING**

Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL

*Pull the circuit breaker of the affected window/windshield heating system, in case of :*

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

*On the rear C/B panel :*

- ANTI ICE L WSHLD C/B AF10 (123VU)
- ANTI ICE R WSHLD C/B AF03 (123VU)
- ANTI ICE/WINDOWS L C/B X14 (122VU)
- ANTI ICE/WINDOWS R C/B W14 (122VU)



## WINDSHIELD/WINDOW CRACKED

**DIAGNOSIS OF INNER PLY.....PERFORM**

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

**MAX FL.....230/MEA**

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

**CAB PRESS MODE SEL.....MAN**

**MAN V/S CTL.....AS RQRD**

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


**CAB PRESS MODE SEL.....AUTO**

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

**CAB PRESS MODE SEL.....MAN**

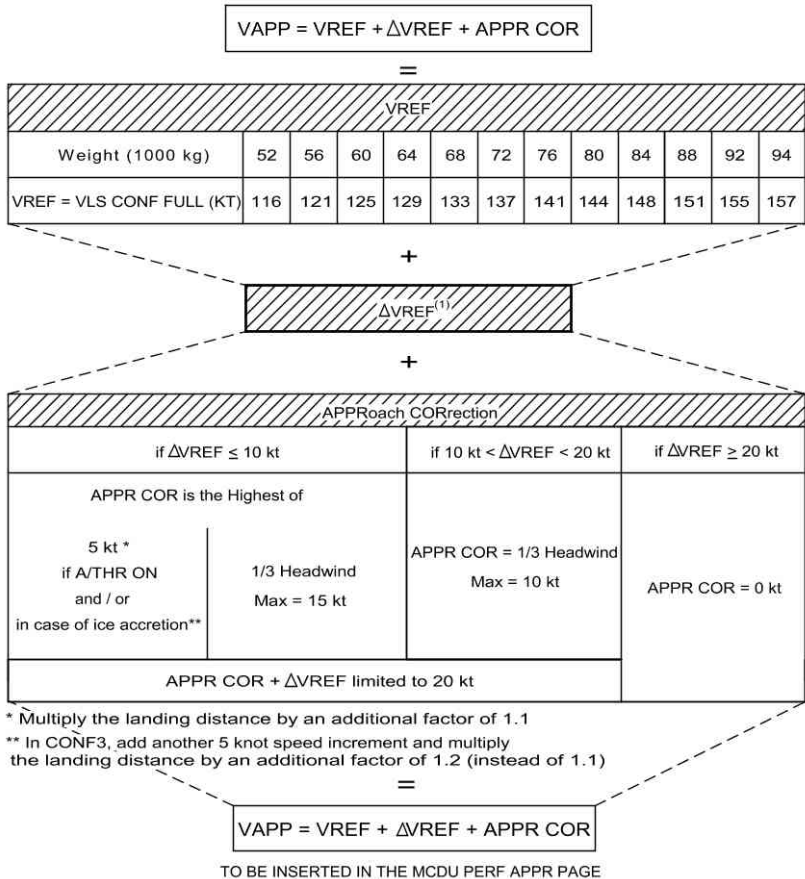
**MAN V/S CTL.....FULL UP**

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>			
SYSTEM	CONDITIONS	RECOMMENDED ACTION	
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)	
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control	
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control	
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.	
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>	
	Fuel temp greater than 45 °C in wing tank	GALLEY (OFF)	
	Fuel temp lower than -40 °C in wing tank	Consider descending to a lower altitude, and/or increasing Mach to increase TAT.	
APU	EGT > EGT MAX -33 °C (inhibited during APU start)		
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.	
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.	
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.	
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <i>Low Speed-</i> Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <i>High Speed-</i> Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>	
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.	
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.	
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).	

## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



(1) Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:


Failure : ALTN LAW  
 Flight Conditions : Autothrust ON, ice accretion  
 Landing Configuration : CONF 3  
 Headwind : 12 kt  
 Landing Weight/CG : 60 t  
 VREF determined from the landing weight : 125 kt  
 VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt} / 3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR CORR = 125 + 10 + 10 = 145$  kt

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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors** “WITHOUT REV” when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors** “WITH REV” when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note: *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)

Compute the LDG DIST:


- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways /A/THR ON / No wind / WITHOUT REV. / Without ice accretion:


FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.60
	3	6			1.75
	3	10			1.40x1.75x1.1=2.70
RESULT	3	10			

VREF = 131 kt. Therefore VAPP = 131+10+5= 146 kt..



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FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	30			1.95*
RESULT	3	30			1.95

VREF = 140 kt. Therefore VAPP = 140+30 = 170 kt.

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		30 MAR 12

<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.50	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.75 2.75	2.75 2.75
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.80 2.00	N/A N/A
	EMER ELEC CONF	3	10	2.75	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	30	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.25*
	S>3	3	5	1.25*	1.20*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.55	1.45 1.55
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.35 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.65	1.35 1.50
	SEC 1+2+3 FAULT	3	10	1.65	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.25*



*Continued from the previous page*


DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.45	1.30 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	GREEN + BLUE	3	25	1.85	1.75
	GREEN + YELLOW	3	30	2.50	N/A
	BLUE + YELLOW	3	10	1.70	1.65
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.60 1.75	1.50 1.60
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.30 1.45
	IR 1+2+3 FAULT	3	10	2.45	2.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.25*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.30*
ENG	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.35	1.15 1.25
	DC EMER CONF	FULL 3	- 6	2.20 2.20	2.20 2.20
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	N/A N/A
	EMER ELEC CONF	3	10	2.20	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.85*
	FLAPS<1				
	S<1	3	45	2.00*	1.75*
	S≥1	3	30	1.70*	1.50*
	1≤FLAPS<2				
	S<1	3	30	1.70*	1.50*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.55*	1.40*
	1≤S≤3	3	10	1.30*	1.20*
	S>3	3	5	1.20*	1.10*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.25*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.40 1.55	1.25 1.35
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.15 1.30
	GREEN + BLUE	3	25	1.95	1.80
	GREEN + YELLOW	3	30	2.05	N/A
	BLUE + YELLOW	3	10	1.80	1.70
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.35	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.20
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
NAV	IR 1+2+3 FAULT	3	10	1.75	1.75
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.35*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.30*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.30*	1.75* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.15 1.25
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.90 1.95
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	N/A N/A
	EMER ELEC CONF	3	10	1.95	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.75*
	FLAPS < 1				
	S<1	3	45	2.00*	1.65*
	S≥1	3	30	1.70*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.60*	1.35*
	S≥1	3	15	1.40*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.50*	1.30*
	S≥1	3	10	1.30*	1.10*
	FLAPS=3				
	S<1	3	25	1.45*	1.25*
	1≤S≤3	3	10	1.25*	1.05*
	S>3	3	5	1.15*	1.00*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.10*	1.00*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.30 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.25
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.15
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.25*	1.05*



*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.10 1.20
	GREEN+BLUE	3	25	1.80	1.65
	GREEN + YELLOW	3	30	2.00	N/A
	BLUE + YELLOW	3	10	1.75	1.55
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
NAV	IR 1+2+3 FAULT	3	10	1.35	1.35
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.30*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.25*	1.05*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.25*	1.70* 1.15*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15

- <sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- <sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- <sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- <sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.


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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.



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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.


The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:

- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>				
ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset	
21	<u>VENT AVNCS</u> SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B Y 17 on 122VU</li><li>- Wait 1 s before pushing the C/B.</li></ul>	
22	<u>AUTO FLT</u> FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul>	
22	<u>AUTO FLT</u> FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s</li><li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"><li>- RE-ENTER the barometer altimeter setting value, if necessary.</li></ul>	




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:                             <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:                             <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.                 </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:                             <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.                 </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G01 on 49VU, M06 on 121VU. G02 on 49VU, M07 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: M06, M07, G01, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<b>On ground, or in flight:</b> Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT & PURS CAPT sw to the CAPT only position. Wait for 3 s. <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M07 on 121VU.</li> </ul> </li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M06 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M07, G02</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<b>On ground, or in flight:</b> The flight crew must reset all the RMPs one after the other via the RMP control panel: <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP* in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<p><b>On ground, or in flight</b></p> <ul style="list-style-type: none"> <li>- Set ELAC 1(2) pb to OFF</li> <li>- Wait 3 s,</li> <li>- Set ELAC 1(2) pb to ON</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>CAUTION</b> Do not reset ELAC, if uncommanded maneuvers occurred during flight.</p> </div> <p><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</p>
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>WARNING</b> Do not reset more than one computer at a time.</p> </div> <p><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</p>
	ELAC or SEC malfunction	ELAC or SEC	<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>WARNING</b> Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"> <li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li> <li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li> </ul> </div>
28	Loss of fuel quantity indication	FQIC	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/B of the affected channel:               <ul style="list-style-type: none"> <li>• Channel 1 (A13 on 49VU)</li> <li>• Channel 2 (M27 on 121VU)</li> </ul> </li> <li>- Wait 5 s, before pushing the C/B.</li> </ul> <p><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</p>
31	FWS FWC 1(2) FAULT	FWC	<p><b>On ground:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"> <li>- FWC 1 (F01 on 49VU)</li> <li>- FWC 2 (Q7 on 121VU)</li> </ul> <p>Wait 50 s after pushing the C/Bs.</p> <p><b>In flight:</b></p> <p>Pull, then push, the C/B of the affected FWC:</p> <ul style="list-style-type: none"> <li>- FWC 1 (F01 on 49VU)</li> <li>- FWC 2 (Q7 on 121VU)</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	BRAKES SYS 1(2) FAULT or BRAKES BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight.</p> <p><u>Note:</u>    After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>    After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	WHEEL N.W STEER FAULT or WHEEL N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>    After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	L/G LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:             <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:             <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>
34	NAV TCAS FAULT	TCAS	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
46	ATSU Malfunction	ATSU	<p>An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.</p> <p><b>On ground, or in flight:</b></p> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

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# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits:
  - AUTOLAND (HWC30 / TWC10 / XWC20)
  - MANUAL LAND (HWC40 / TWC10 / XWC25)
  - OEI ROLLOUT (IDLE REV ONLY XWC15)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	



## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

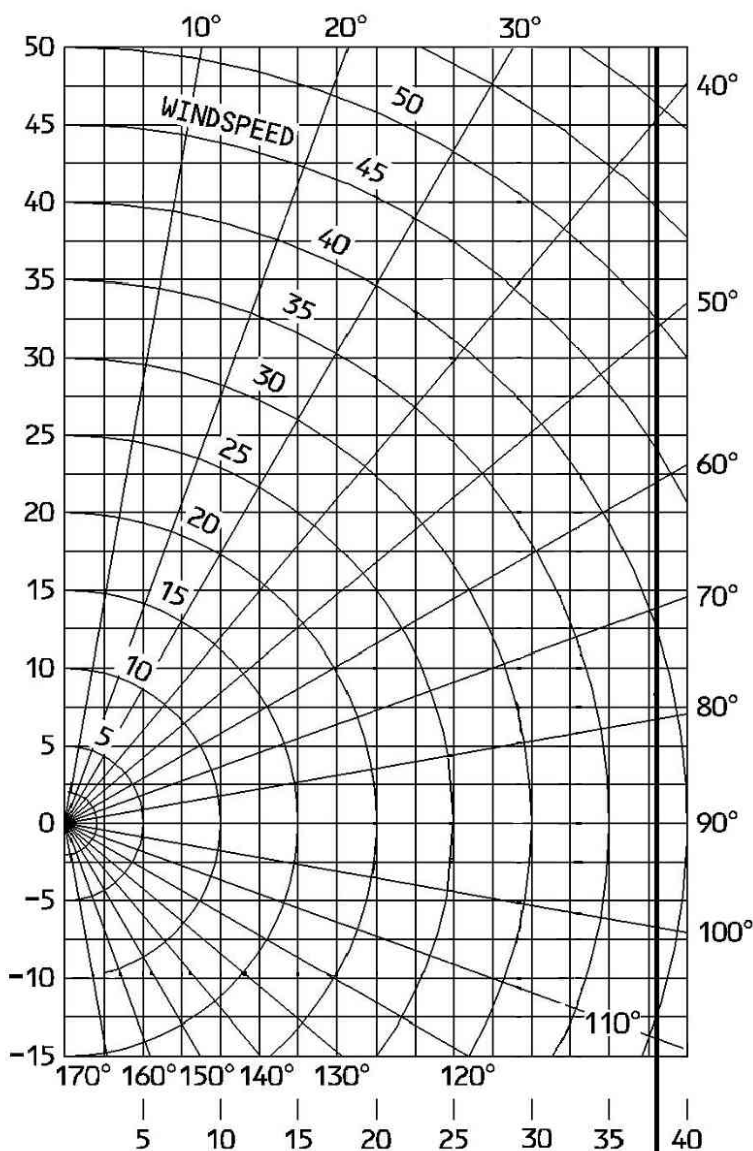
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## WIND COMPONENT CHART - A321



### Weather LIMITS:

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

CAT II Autoland  
30 knots headwind  
20 knots x-wind  
10 knots tailwind  
15 knot x-wind limit  
for OEI Rollout with  
IDLE reverse only.

CAT II No Autoland  
40 knots headwind  
25 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A321

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02	
			S ≥ 1	03	NAV	IR 1+2+3 FAULT		01
	1 ≤ FLAPS < 2	S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02		
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	03	
	2 ≤ FLAPS < 3	S < 1	06	BLEED			DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion	
			S ≥ 1		07			
	FLAP = 3	S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	09			REV UNLOCK with buffet (CONF 3)		02
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
	F/CTL	FLAP > 3		S < 1		11		
				1 ≤ S ≤ 3	12			
				S > 3	13			
ONE SPLR FAULT		01						
TWO SPLR FAULT		02						
THREE SPLR FAULT		03						
ALL SPLR FAULT/GND SPLR FAULT		04						
SEC 1 or SEC 3 FAULT		05						
SEC 2 FAULT		06						
SEC 2 + 3 FAULT		07						
SEC 1 + 3 FAULT		08						
SEC 1 + 2 FAULT		09						
RUDDER JAM		10						
SEC 1 + 2 + 3 FAULT		11						
ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12						

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**IN FLIGHT PERFORMANCE**

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**SPEEDS**

OPERATING SPEEDS (KT)					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
52	130	168	188	121	116
56	135	174	194	125	121
60	140	180	200	130	125
64	144	186	206	134	129
68	149	192	212	138	133
72	153	197	218	142	137
76	157	203	224	146	141
80	161	208	230	150	144
84	165	213	236	154	148
88	169	218	242	157	151
92	173	223	248	161	155
94	175	226	251	163	157

(1) Above FL 200 add 1 kt per additional 1 000 ft.

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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

W(1000Kg)	52	56	60	64	68	72	76	80	84	88	92	94
VLS CONF FULL (KT)	116	121	125	129	133	137	141	144	148	151	155	157
VLS CONF 3 (KT)	121	125	130	134	138	142	146	150	154	157	161	163

+

CORRECTION

5KT <sup>(1)</sup>		1/3 HEADWIND (EXCLUDING GUST) MAX=15KT
--------------------	--	----------------------------------------------

WHICHEVER IS HIGHER

=

VAPP

$$V_{APP}^{(2)} = \text{MAX}(VLS + 5Kt^{(1)}; VLS + W_{IND} \text{ CORR})$$

1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
  2. In case of ice accretion, Vapp must not be lower than:
    - VLS + 5 kt in CONF FULL
    - VLS + 10 kt in CONF 3
- In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		860	900	940	980	1020	1070	1150	1370	1470	1570
	WET		1110	1180	1250	1330	1400	1470	1540	1670	1770	1860
	COVERED WITH	STANDING WATER	1550	1660	1760	1880	1990	2080	2200	2310	2420	2520
		SLUSH	1490	1580	1670	1770	1870	1980	2070	2170	2280	2370
		COMPACTED SNOW	1390	1460	1530	1600	1670	1730	1790	1850	1920	1980
		ICE	2780	2910	3050	3190	3310	3440	3560	3700	3830	3950
CORRECTION ON ACTUAL LANDING DISTANCE												
RUNWAY CONDITION	dry runway	wet runway	runway covered with									
			standing water	slush	compacted snow		ice					
per 1 000 ft above SL	+3 %	+4 %	+4 %		+5 %		+4 %		+5 %			
per 10 kt headwind	No correction for headwind due to wind correction on approach speed											
per 10 kt tailwind	+16 %	+21 %	+22 %		+21 %		+16 %		+26 %			
2 reversers operative	-5 %	-8 %	-17 %		-16 %		-11 %		-29 %			
Per 5 kt speed increment (and no failure) add 8 % (all runways)												

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 74 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 1 020 m

Read from the Corrections table,  
Pressure altitude correction: 3 x 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt no reversers) = 1020 x 1.06 x 1.08 = 1 170 m.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		820	850	890	930	970	1020	1080	1290	1380	1470
	WET		1040	1100	1160	1230	1290	1360	1430	1540	1640	1720
	COVERED WITH	STANDING WATER	1430	1530	1640	1740	1840	1940	2030	2140	2240	2340
		SLUSH	1390	1470	1560	1640	1730	1820	1920	2020	2120	2210
		COMPACTED SNOW	1310	1380	1440	1510	1570	1630	1680	1750	1810	1860
		ICE	2590	2720	2850	2970	3090	3210	3320	3450	3580	3690

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+4 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+16 %	+21 %	+24 %	+22 %	+16 %	+27 %
2 reversers operative	-4 %	-8 %	-16 %	-15 %	-11 %	-28 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW =74 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 970 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 970 × 1.06 × 1.08 = 1 120 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		MODE	54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND
RUNWAY CONDITION												
DRY		MED LOW	1340 1920	1440 2100	1550 2290	1650 2460	1810 2640	1970 2810	+5 +3	0 0	+13 +15	-2 -2
WET		MED LOW	1410 1920	1540 2100	1690 2290	1830 2460	2010 2640	2200 2810	+6 +3	-3 0	+17 +15	-3 -2
COVERED WITH	STANDING WATER	MED LOW	1770 1900	1990 2090	2210 2300	2410 2490	2640 2720	2860 2940	+6 +4	-17 0	+21 +18	-4 -2
		SLUSH	MED LOW	1700 1860	1890 2030	2100 2220	2290 2400	2490 2590	2690 2790	+7 +5	-16 0	+21 +17
	COMPACTED SNOW		MED LOW	1580 1870	1700 2050	1830 2230	1940 2390	2060 2560	2170 2730	+6 +4	-12 0	+15 +15
		ICE	MED LOW	2980 3000	3240 3260	3530 3550	3780 3800	4040 4060	4290 4320	+6 +5	-29 -26	+25 +26

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	
RUNWAY CONDITION	MODE											
DRY		MED	1280	1370	1460	1530	1660	1800	+3	0	+13	-1
		LOW	1830	1990	2150	2300	2450	2590	+3	0	+14	-2
WET		MED	1330	1440	1560	1670	1820	1980	+4	-2	+16	-2
		LOW	1830	1990	2150	2300	2450	2590	+3	0	+14	-2
COVERED WITH	STANDING WATER	MED	1660	1830	2020	2190	2400	2580	+4	-16	+20	-3
		LOW	1810	1980	2150	2310	2490	2660	+4	0	+18	-2
	SLUSH	MED	1590	1760	1940	2080	2270	2440	+5	-16	+20	-3
		LOW	1770	1930	2080	2220	2380	2540	+5	0	+16	-2
	COMPACTED SNOW	MED	1500	1600	1710	1800	1890	1970	+4	-11	+14	-2
		LOW	1780	1940	2090	2230	2380	2520	+4	0	+14	-2
	ICE	MED	2790	3030	3270	3490	3720	3940	+5	-28	+25	-4
		LOW	2810	3050	3290	3510	3740	3960	+5	-26	+26	-4

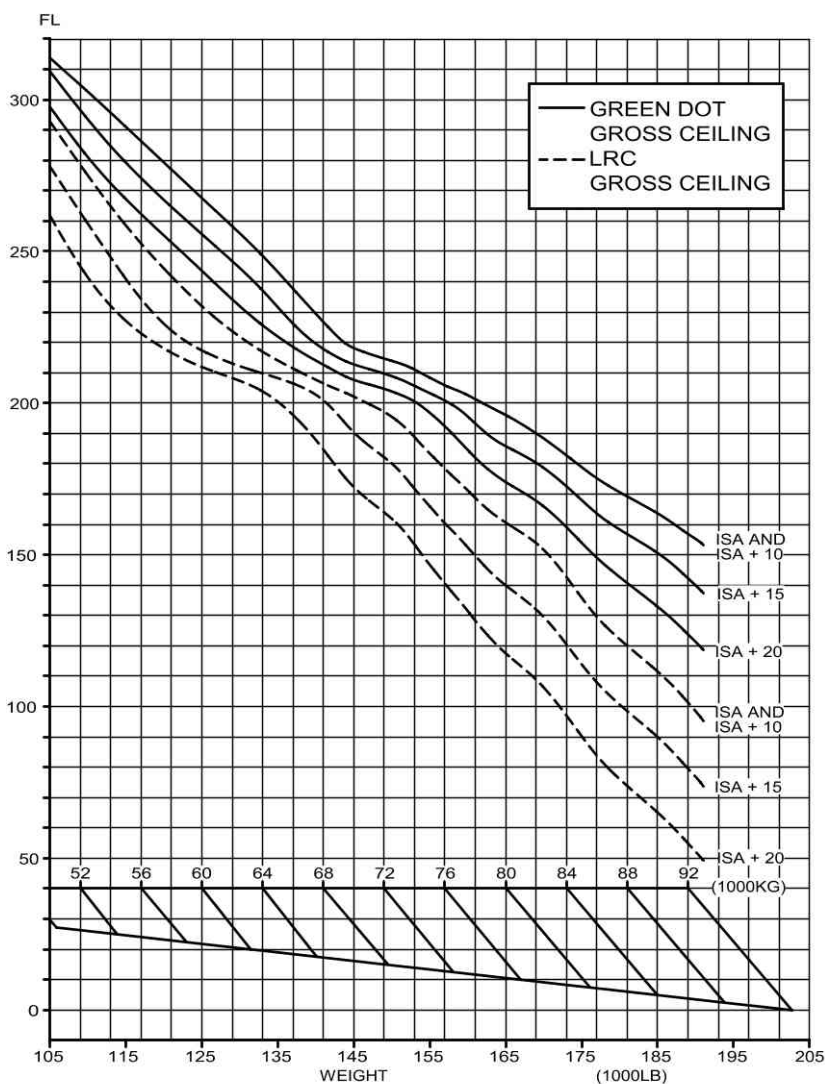
Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).



## CEILINGS

### ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA	ISA + 10	ISA + 15	ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-1 300 ft	-1 400 ft	-1 400 ft
	TOTAL ANTI ICE ON	-2 800 ft	-2 800 ft	-2 800 ft	-3 000 ft
GREEN DOT	ENGINE ANTI ICE ON	-1 000 ft	-1 000 ft	-1 100 ft	-1 200 ft
	TOTAL ANTI ICE ON	-2 100 ft	-2 100 ft	-2 300 ft	-2 500 ft

Note: For weights 85 000 kg or 187 400 lb, one engine ceilings at Long Range speed may be overestimated by FMS Legacy. In this case, ceiling values provided in the above graph should be retained.

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>2/4</b> 30 MAR 12

## GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

### ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		DISTANCE (NM) INITIAL SPEED (KT)		TIME (MIN) FUEL(1000KG) LEVEL OFF (FT)
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL						
	250	290	310	330	350	370	390
50				174 32 198 .9 31700	228 42 200 1.1 31800	262 47 202 1.3 31900	288 52 204 1.3 31900
54			156 29 202 .9 30100	222 41 204 1.2 30200	258 47 206 1.4 30300	285 52 208 1.5 30300	308 55 210 1.5 30400
58		152 29 206 .9 28200	231 43 208 1.3 28500	269 50 210 1.5 28600	298 54 212 1.7 28600	320 58 214 1.7 28700	339 61 216 1.8 28700
62		236 45 212 1.5 26400	279 52 214 1.7 26600	309 57 216 1.8 26600	333 61 218 1.9 26700	352 64 220 2.0 26700	369 67 222 2.1 26800
66	155 30 214 1.1 24200	281 53 218 1.8 24600	314 59 220 2.0 24600	339 63 222 2.1 24700	360 67 224 2.2 24700	378 69 226 2.3 24800	393 71 228 2.3 24800
70	231 45 220 1.7 22600	311 59 224 2.1 22800	335 63 226 2.2 22800	357 67 228 2.3 22900	376 70 230 2.4 22900	392 72 232 2.5 22900	406 74 234 2.5 23000
74	214 41 226 1.6 21300	278 53 230 2.0 21400	301 56 232 2.1 21400	321 60 234 2.2 21500	339 62 236 2.2 21500	354 65 238 2.3 21500	
78	212 40 232 1.6 20500	264 49 236 1.9 20600	283 52 238 2.0 20600	301 55 240 2.1 20600	316 57 242 2.2 20600	330 60 244 2.2 20600	
82	242 46 238 1.9 19600	282 52 242 2.1 19700	298 55 244 2.2 19700	313 57 246 2.3 19700	326 59 248 2.3 19800		
86	278 52 244 2.3 18400	317 58 248 2.5 18400	332 61 250 2.6 18500	346 63 252 2.6 18500	359 65 254 2.7 18500		
90	300 56 250 2.6 17100	335 61 254 2.7 17200	349 64 256 2.8 17200	363 66 258 2.9 17200			
94	317 59 256 2.8 15900	350 64 260 3.0 15900	363 66 262 3.0 16000	375 67 264 3.1 16000			
CORRECTIONS		DISTANCE		TIME	FUEL	LEVEL OFF	
ENGINE ANTI ICE ON		+ 15 %		+ 12 %	+ 18 %	- 200 FT	
TOTAL ANTI ICE ON		+ 20 %		+ 24 %	+ 33 %	- 700 FT	



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b> 30 MAR 12

## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)		MACH IAS (KT)	
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.181 .442	1.250 .480	1.319 .507	1.369 .530	1.417 .549	1.472 .571	
	1972 244	1915 241	1856 236	1874 237	1870 236	1875 236	
<b>54</b>	1.199 .454	1.281 .494	1.363 .529	1.411 .548	1.464 .569	1.520 .588	
	2093 251	2047 249	2029 246	2028 246	2032 245	2034 243	
<b>58</b>	1.223 .466	1.310 .506	1.402 .546	1.454 .567	1.510 .587	1.554 .591	
	2224 258	2174 255	2185 255	2190 254	2196 253	2138 244	
<b>62</b>	1.253 .484	1.344 .521	1.441 .562	1.497 .583	1.536 .585	1.568 .551	
	2387 268	2330 263	2343 262	2354 262	2277 252	2121 227	
<b>66</b>	1.278 .495	1.380 .538	1.480 .578	1.534 .595	1.548 .548		
	2519 274	2499 272	2504 270	2503 267	2252 235		
<b>70</b>	1.303 .506	1.412 .552	1.517 .591	1.547 .578			
	2651 280	2651 278	2667 277	2519 260			
<b>74</b>	1.327 .515	1.446 .567	1.549 .600	1.562 .528			
	2785 286	2818 286	2811 281	2482 236			
<b>78</b>	1.359 .531	1.478 .579	1.557 .577				
	2968 295	2979 293	2795 270				
<b>82</b>	1.385 .543	1.510 .592	1.574 .523				
	3124 301	3146 299	2758 243				
<b>86</b>	1.412 .554	1.519 .580					
	3282 308	3163 293					
<b>90</b>	1.440 .567	1.529 .559					
	3449 315	3158 282					
<b>94</b>	1.456 .569	1.549 .512					
	3540 316	3139 258					
ENGINE ANTI ICE ON △FUEL = + 2 %				TOTAL ANTI ICE ON △FUEL = + 4 %			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>4/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

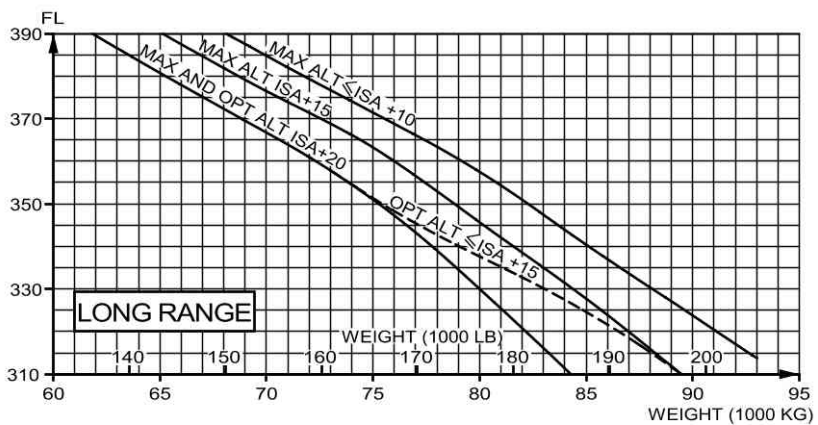
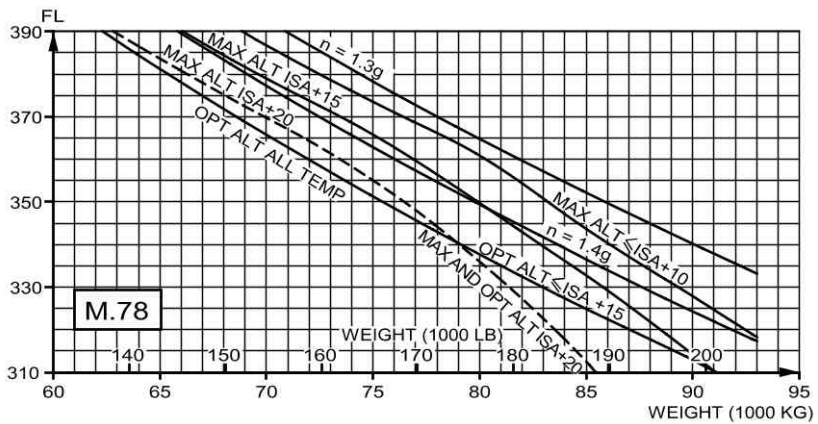
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
AIR DIST.		FLIGHT LEVEL					CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1510 0.46	1317 0.44	1180 0.42	1131 0.41	1083 0.41	1061 0.41	9	7	6
300	2259 1.06	2008 1.03	1826 0.59	1762 0.58	1699 0.57	1670 0.58	15	14	13
400	3004 1.27	2694 1.22	2468 1.17	2388 1.15	2312 1.14	2276 1.15	21	20	20
500	3745 1.47	3377 1.41	3106 1.34	3010 1.32	2921 1.31	2877 1.32	27	27	27
600	4481 2.08	4055 2.00	3739 1.52	3628 1.49	3527 1.48	3475 1.49	34	34	34
700	5212 2.28	4729 2.19	4369 2.10	4241 2.07	4129 2.04	4069 2.05	40	40	41
800	5938 2.49	5400 2.39	4994 2.28	4851 2.24	4727 2.21	4659 2.22	46	47	48
900	6659 3.10	6066 2.58	5615 2.46	5456 2.41	5320 2.38	5247 2.38	52	53	54
1000	7376 3.31	6728 3.17	6232 3.04	6058 2.59	5907 2.55	5831 2.55	58	60	61
1100	8088 3.52	7387 3.37	6845 3.22	6656 3.16	6490 3.12	6413 3.11	63	66	68
1200	8798 4.13	8042 3.56	7454 3.41	7250 3.34	7070 3.29	6991 3.28	69	73	74
1300	9506 4.34	8693 4.16	8059 3.59	7840 3.52	7645 3.46	7566 3.44	75	79	81
1400	10209 4.55	9340 4.36	8661 4.17	8427 4.10	8217 4.03	8137 4.00	81	86	87
ENGINE ANTI ICE ON △FUEL = + 2 %					TOTAL ANTI ICE ON △FUEL = + 4 %				

FLIP23 A321-131 IAE V2530-A5 3610 03301.001011 0250300 .7801 .000100 140 0300350 60 0 100100 40100 18590 CL-N0-04-07-150



## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 500 ft Opt ALT : - 300 ft	Max ALT : -1 100 ft Opt ALT : - 300 ft
ISA +15	Max ALT : - 700 ft Opt ALT : - 300 ft	Max ALT : -1 500 ft Opt ALT : - 600 ft
ISA +20	Max ALT : -1 000 ft Opt ALT : -1 000 ft	Max ALT : -2 300 ft Opt ALT : -2 300 ft

# IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

**ALL ENGINES**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 – DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 65000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
						TIME (H.MIN)			
AIR	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
DIST.							FL290	FL330	FL370
(NM)	290	310	330	350	370	390	FL310	FL350	FL390
200	1037 0.36	978 0.36	926 0.36	880 0.36	842 0.36	816 0.36	1	2	4
400	2281 1.02	2158 1.02	2049 1.02	1956 1.03	1885 1.03	1854 1.03	7	10	20
600	3518 1.27	3329 1.28	3164 1.29	3023 1.29	2918 1.30	2875 1.30	13	18	33
800	4747 1.53	4494 1.54	4271 1.55	4081 1.56	3939 1.56	3882 1.56	19	25	45
1000	5970 2.19	5650 2.20	5370 2.22	5131 2.23	4951 2.23	4874 2.23	25	33	57
1200	7185 2.45	6799 2.47	6461 2.48	6171 2.49	5952 2.50	5852 2.50	31	40	67
1400	8393 3.11	7941 3.13	7544 3.14	7204 3.16	6944 3.17	6816 3.17	36	47	77
1600	9596 3.37	9076 3.39	8620 3.41	8228 3.43	7925 3.44	7768 3.44	41	54	86
1800	10792 4.03	10205 4.05	9689 4.07	9244 4.09	8898 4.10	8707 4.10	46	60	94
2000	11983 4.29	11327 4.31	10751 4.34	10254 4.36	9865 4.37	9640 4.37	51	66	102
2200	13167 4.55	12442 4.58	11806 5.00	11256 5.03	10825 5.04	10566 5.04	56	73	110
2400	14345 5.21	13551 5.24	12855 5.26	12251 5.29	11776 5.31	11482 5.31	61	79	117
2600	15518 5.47	14654 5.50	13897 5.53	13239 5.56	12720 5.58	12388 5.58	65	85	125
2800	16685 6.13	15750 6.16	14932 6.19	14220 6.23	13657 6.24	13286 6.24	68	90	131
3000	17851 6.39	16841 6.42	15961 6.46	15195 6.49	14586 6.51	14175 6.51	72	96	138
ECON AIR CONDITIONING △FUEL = - 0.6 %			ENGINE ANTI ICE ON △FUEL = + 2 %			TOTAL ANTI ICE ON △FUEL = + 5 %			

FLIP22B A321-131 IAE V2530-A53610 03301.300211 0250300 .7800 .000200 140 0300350 65 0 100100 40100 18590
CL-N0-CL-004-009-1E0

# COST INDEX FOR LONG RANGE CRUISE SPEED

**ALL ENGINES**

For a quick determination of the  $CI_{LRC}$ , use:

- $CI_{LRC}$  = 50 kg/min in the FMGC.
- or
- $CI_{LRC}$  = 70 (100 lb/h) in the FMGC.



## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)	60				80				IAS (KT)
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.7	173	100	IDLE					241
370	15.9	166	95	IDLE	18.0	186	108	IDLE	252
350	15.2	159	90	IDLE	17.3	179	103	IDLE	264
330	14.6	153	85	IDLE	16.6	173	98	IDLE	277
310	14.0	148	81	IDLE	16.0	167	93	IDLE	289
290	13.5	143	76	IDLE	15.3	161	88	IDLE	300
270	12.8	137	71	IDLE	14.5	154	81	IDLE	300
250	12.1	131	66	IDLE	13.6	146	75	IDLE	300
240	11.7	127	63	IDLE	13.2	143	72	IDLE	300
220	11.0	121	58	IDLE	12.3	135	66	IDLE	300
200	10.2	114	53	IDLE	11.5	127	60	IDLE	300
180	9.5	108	48	IDLE	10.5	119	54	IDLE	300
160	8.7	100	43	IDLE	9.6	110	48	IDLE	300
140	7.9	93	39	IDLE	8.7	101	42	IDLE	300
120	7.1	85	34	IDLE	7.7	92	37	IDLE	300
100	6.3	76	29	IDLE	6.7	81	31	IDLE	300
50	2.4	30	10	IDLE	2.5	32	11	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		ECON AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		—		+ 1 min		+ 3 min		+ 0.2 %	
FUEL		— 2 %		+ 17 %		+ 90 %		+ 0.7 %	
DISTANCE		—		+ 4 %		+ 20 %		+ 0.4 %	

10B-08FA321-131IAEV2530-A523100000C5KG330001859000-1-350.015.0.00003.780300.000250.0000 FCOM-NO-03-05-30-002-150

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 120 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 100 KG (4MIN)									
REF. LDG WT AT DEST. = 60000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	601 0.12						2		
60	775 0.16						4		
80	950 0.20	898 0.19					5		
100	1124 0.23	1056 0.23	1035 0.22				6	6	
120	1299 0.27	1213 0.26	1172 0.26	1172 0.25			7	7	
140	1474 0.31	1371 0.30	1310 0.29	1294 0.28			8	8	
160	1649 0.35	1529 0.33	1447 0.32	1416 0.31	1423 0.31		9	8	10
180	1825 0.39	1687 0.37	1585 0.35	1539 0.35	1536 0.34	1547 0.33	10	9	12
200	2000 0.43	1845 0.40	1723 0.38	1662 0.38	1650 0.36	1654 0.36	11	10	13
220	2176 0.46	2003 0.44	1860 0.42	1784 0.41	1763 0.39	1761 0.39	12	10	14
240	2352 0.50	2161 0.47	1998 0.45	1907 0.44	1877 0.42	1869 0.41	13	11	15
260	2529 0.54	2320 0.50	2136 0.48	2030 0.47	1991 0.45	1976 0.44	15	12	16
280	2705 0.58	2479 0.54	2274 0.51	2153 0.50	2105 0.48	2084 0.47	16	13	17
300	2882 1.02	2638 0.57	2413 0.54	2277 0.53	2220 0.51	2192 0.50	17	13	18
320	3059 1.05	2797 1.01	2551 0.58	2400 0.57	2334 0.54	2300 0.53	18	14	20
340	3236 1.09	2956 1.04	2689 1.01	2524 1.00	2449 0.57	2408 0.55	19	15	21
360	3414 1.13	3115 1.07	2828 1.04	2647 1.03	2563 1.00	2516 0.58	20	16	22
380	3591 1.17	3275 1.11	2966 1.07	2771 1.06	2678 1.03	2625 1.01	21	16	23
400	3769 1.21	3435 1.14	3105 1.10	2895 1.09	2793 1.06	2733 1.04	22	17	24
420	3947 1.24	3594 1.18	3243 1.14	3019 1.12	2908 1.09	2842 1.06	23	18	25
440	4125 1.28	3754 1.21	3382 1.17	3143 1.15	3023 1.12	2951 1.09	25	19	26
460	4304 1.32	3915 1.24	3521 1.20	3267 1.18	3138 1.15	3060 1.12	26	20	27
480	4482 1.35	4075 1.28	3660 1.23	3392 1.21	3253 1.18	3169 1.15	27	20	28
500	4661 1.39	4235 1.31	3799 1.26	3516 1.25	3369 1.21	3278 1.18	28	21	30
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 4 %			ΔFUEL = + 6 %			

CL-W0-04-13-155

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-CAB</b> <b>1/2</b> 30 MAR 12
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## IN CRUISE QUICK CHECK FL 100 LONG RANGE

### FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING CRUISE : LONG RANGE - DESCENT : 250KT IMC PROCEDURE : 140 KG (6MIN)								FL100
NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)							
	65	70	75	80	85	90	95	
40	337 0.15	339 0.15	342 0.15	347 0.15	353 0.15	361 0.15	370 0.15	
60	515 0.18	523 0.18	531 0.18	540 0.18	551 0.18	561 0.18	571 0.18	
80	693 0.22	706 0.22	719 0.21	733 0.21	748 0.21	761 0.21	773 0.21	
100	871 0.26	890 0.25	908 0.25	926 0.24	945 0.24	960 0.24	975 0.24	
120	1048 0.30	1073 0.29	1096 0.28	1119 0.28	1141 0.27	1160 0.27	1176 0.27	
140	1226 0.33	1256 0.32	1284 0.31	1312 0.31	1338 0.30	1359 0.30	1378 0.30	
160	1403 0.37	1438 0.36	1472 0.35	1504 0.34	1534 0.33	1559 0.33	1580 0.33	
180	1580 0.41	1621 0.39	1659 0.38	1696 0.37	1731 0.36	1758 0.36	1782 0.36	
200	1757 0.45	1803 0.43	1846 0.42	1888 0.41	1927 0.39	1957 0.39	1984 0.39	
220	1933 0.48	1985 0.46	2034 0.45	2080 0.44	2123 0.43	2156 0.42	2185 0.42	
240	2110 0.52	2167 0.50	2221 0.48	2271 0.47	2319 0.46	2355 0.45	2387 0.45	
260	2286 0.56	2349 0.53	2407 0.52	2463 0.51	2515 0.49	2554 0.48	2589 0.48	
280	2462 1.00	2530 0.57	2594 0.55	2654 0.54	2710 0.52	2753 0.51	2791 0.51	
300	2637 1.04	2711 1.00	2780 0.58	2845 0.57	2906 0.55	2952 0.54	2993 0.54	
320	2813 1.07	2892 1.04	2967 1.02	3036 1.00	3101 0.59	3150 0.57	3195 0.57	
340	2988 1.11	3073 1.07	3153 1.05	3227 1.04	3296 1.02	3349 1.00	3397 1.00	
360	3164 1.15	3254 1.11	3339 1.09	3417 1.07	3491 1.05	3547 1.03	3599 1.03	
380	3339 1.19	3434 1.15	3524 1.12	3608 1.10	3686 1.08	3745 1.05	3800 1.05	
400	3513 1.23	3615 1.18	3710 1.15	3798 1.14	3881 1.12	3943 1.08	4001 1.08	
420	3688 1.26	3795 1.22	3895 1.19	3988 1.17	4076 1.15	4141 1.11	4202 1.11	
440	3862 1.30	3975 1.25	4080 1.22	4177 1.20	4270 1.18	4339 1.14	4402 1.14	
460	4037 1.34	4154 1.29	4265 1.26	4367 1.24	4465 1.22	4537 1.17	4603 1.17	
480	4211 1.38	4334 1.33	4450 1.29	4557 1.27	4659 1.25	4735 1.20	4803 1.20	
500	4384 1.42	4513 1.36	4635 1.33	4746 1.30	4853 1.28	4932 1.23	5003 1.23	
520	4558 1.46	4692 1.40	4819 1.36	4935 1.34	5047 1.32	5130 1.26	5203 1.26	
540	4732 1.49	4871 1.43	5003 1.40	5124 1.37	5241 1.35	5327 1.29	5403 1.29	
AIR CONDITIONING OFF △FUEL = - 2 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 5 %			

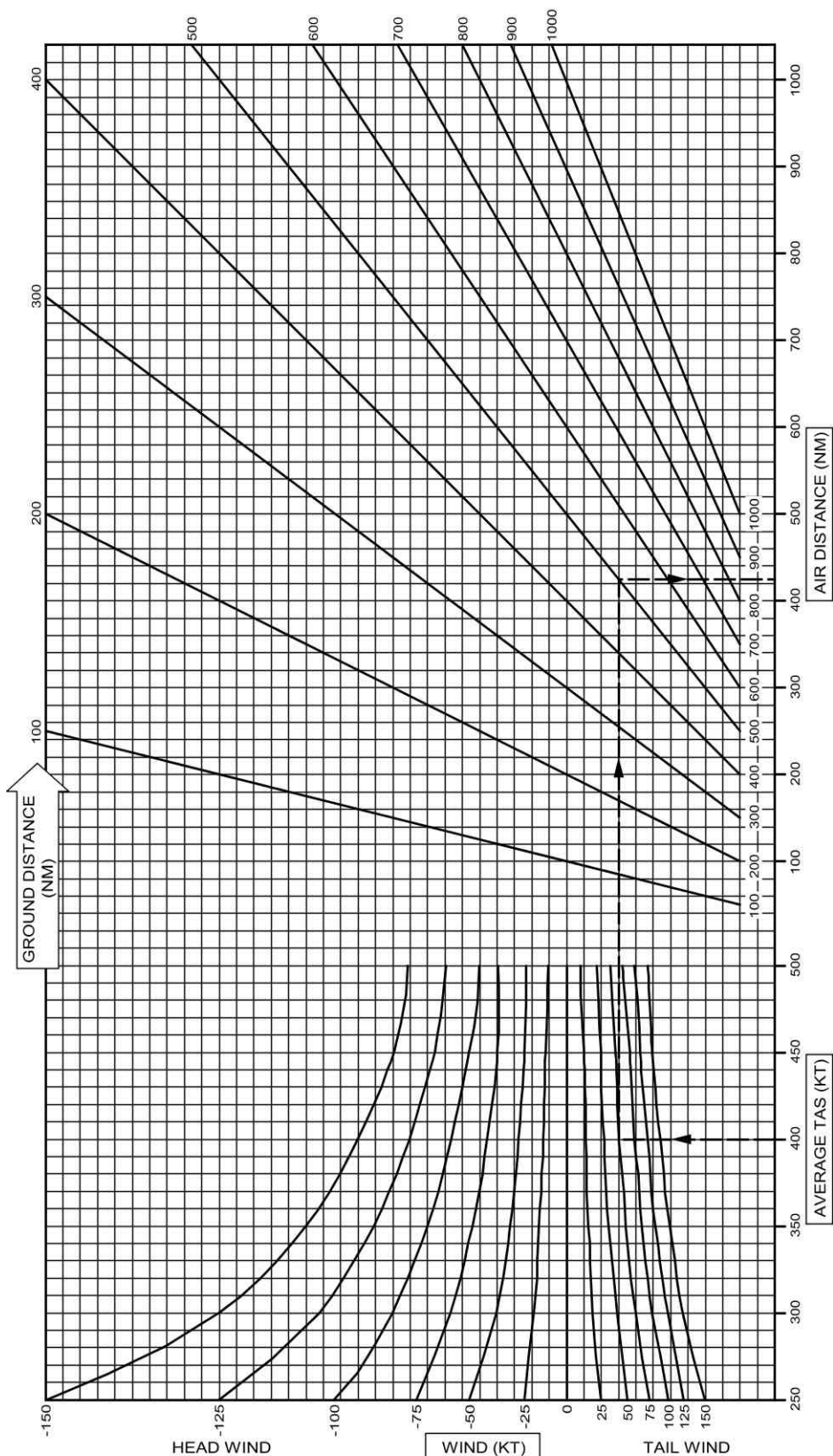
 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	IN FLIGHT PERFORMANCE	FPE-CAB <b>2/2</b>
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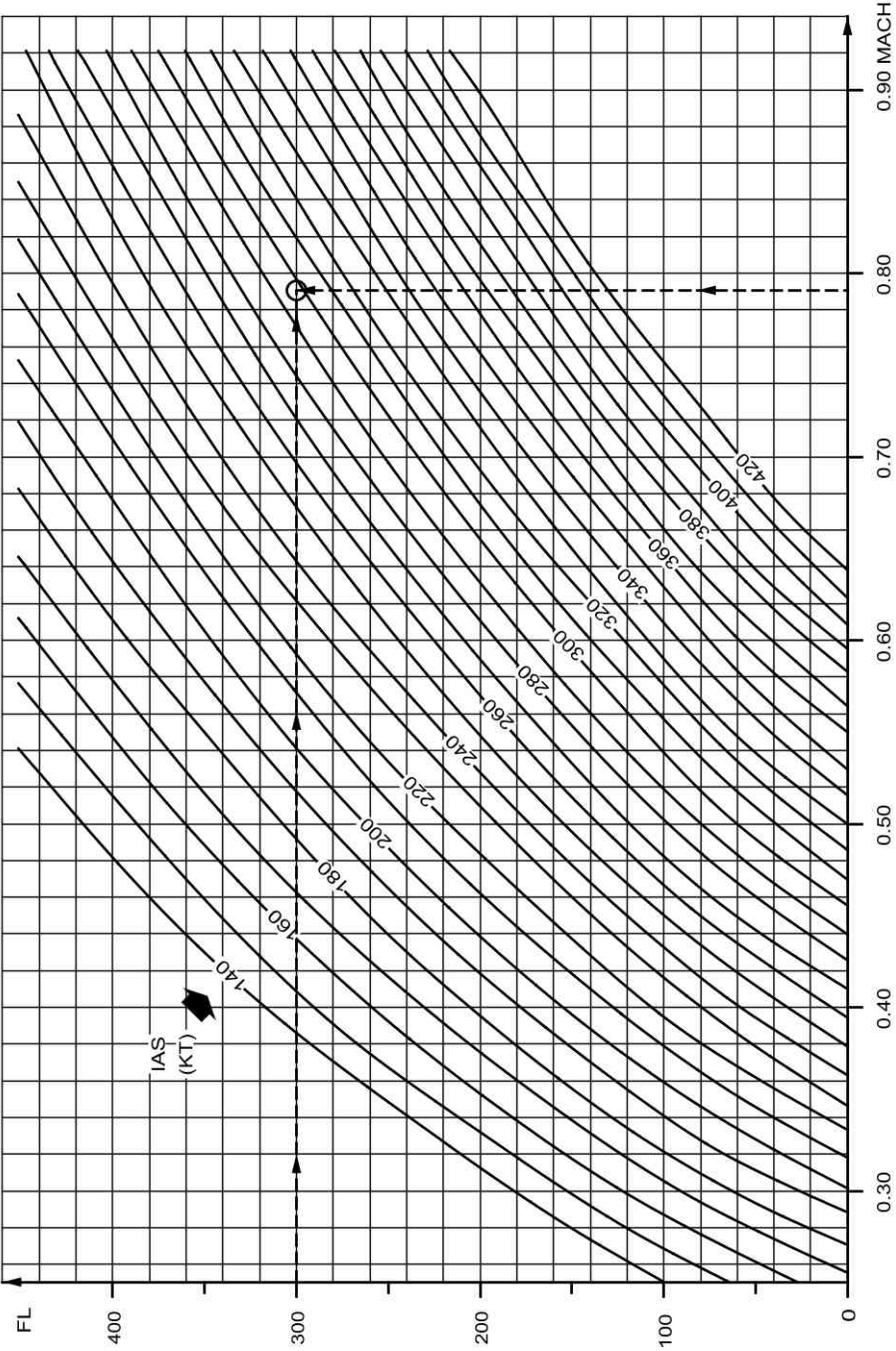




## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

FPF (HYD G SYS LO PR) = 10 %

FPF (INOP SYS: L AIL) = 8 %

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x (10 % + 8 %)

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x 8 %

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

## FUEL PENALTY FACTORS/INOP SYS TABLE

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
<b>F/CTL</b>	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
<b>L/G</b>	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**SEVERE TURBULENCE..... OPS.01**

**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)										
		54	58	62	66	70	74	78	82	86	90	94
		N1 %										
390	0.76	79.4	80.6	-	-	-	-	-	-	-	-	-
370	0.76	77.9	78.9	80.0	81.2	-	-	-	-	-	-	-
350	0.76	77.2	77.9	78.8	79.7	80.7	-	-	-	-	-	-
330	0.76	76.9	77.6	78.2	79.0	79.8	80.7	81.6	-	-	-	-
310	0.76	76.7	77.3	77.9	78.5	79.2	79.9	80.6	81.5	82.4	-	-
290	0.76	76.7	77.2	77.7	78.2	78.8	79.4	80.0	80.6	81.4	82.1	83.0
270	300	76.2	76.6	77.0	77.5	78.0	78.5	79.1	79.6	80.3	80.9	81.6
250	300	75.0	75.4	75.8	76.2	76.7	77.1	77.7	78.2	78.9	79.5	80.2
200	300	72.2	72.5	72.9	73.3	73.7	74.2	74.7	75.2	75.8	76.4	77.0
150	270	65.5	65.9	66.5	67.0	67.7	68.4	69.2	70.3	71.0	71.8	72.6
100	270	62.5	62.9	63.5	64.0	64.6	65.3	66.0	66.8	67.6	68.4	69.2
50	270	59.1	59.5	60.0	60.5	61.1	61.8	62.6	63.4	64.2	65.0	65.7

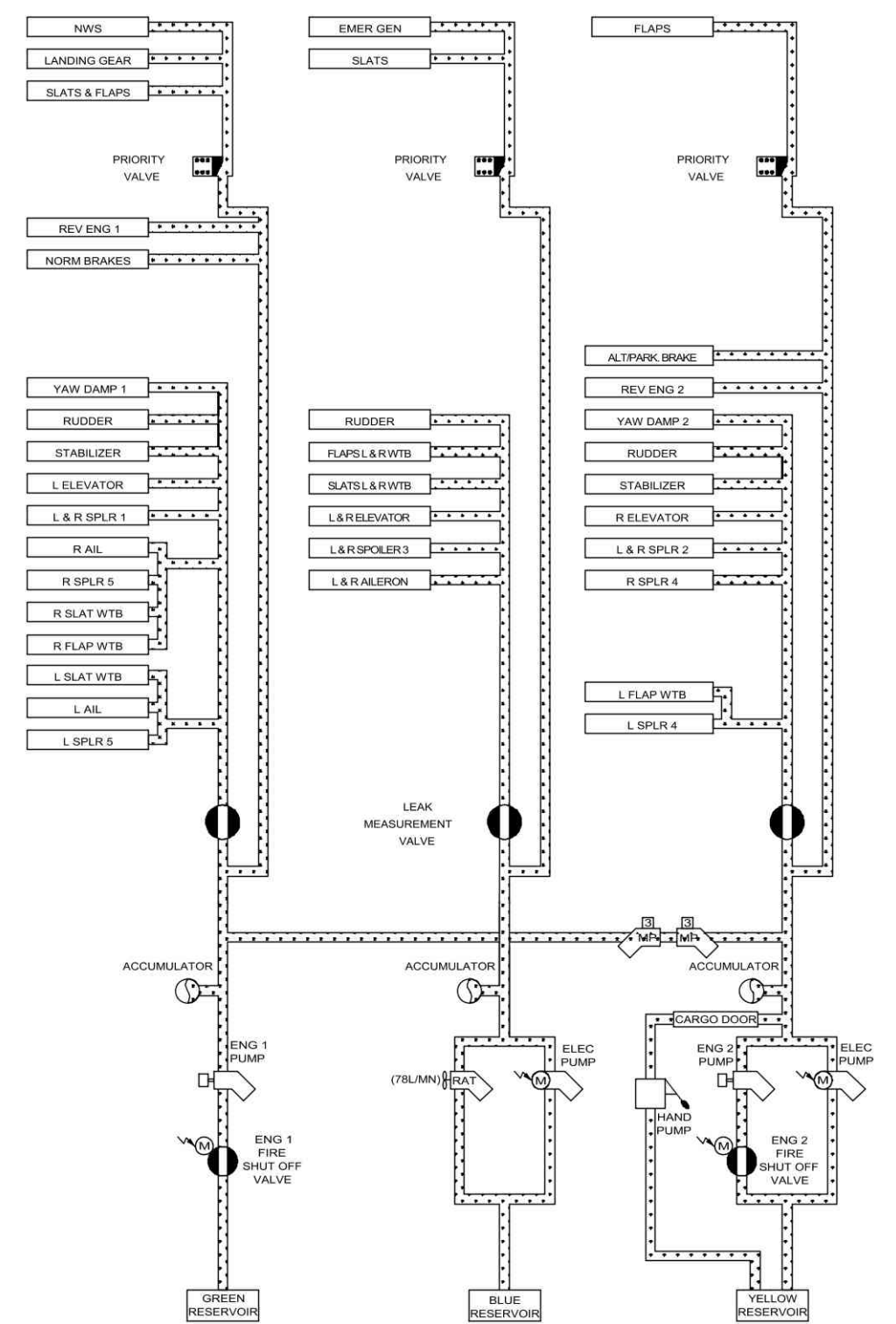
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

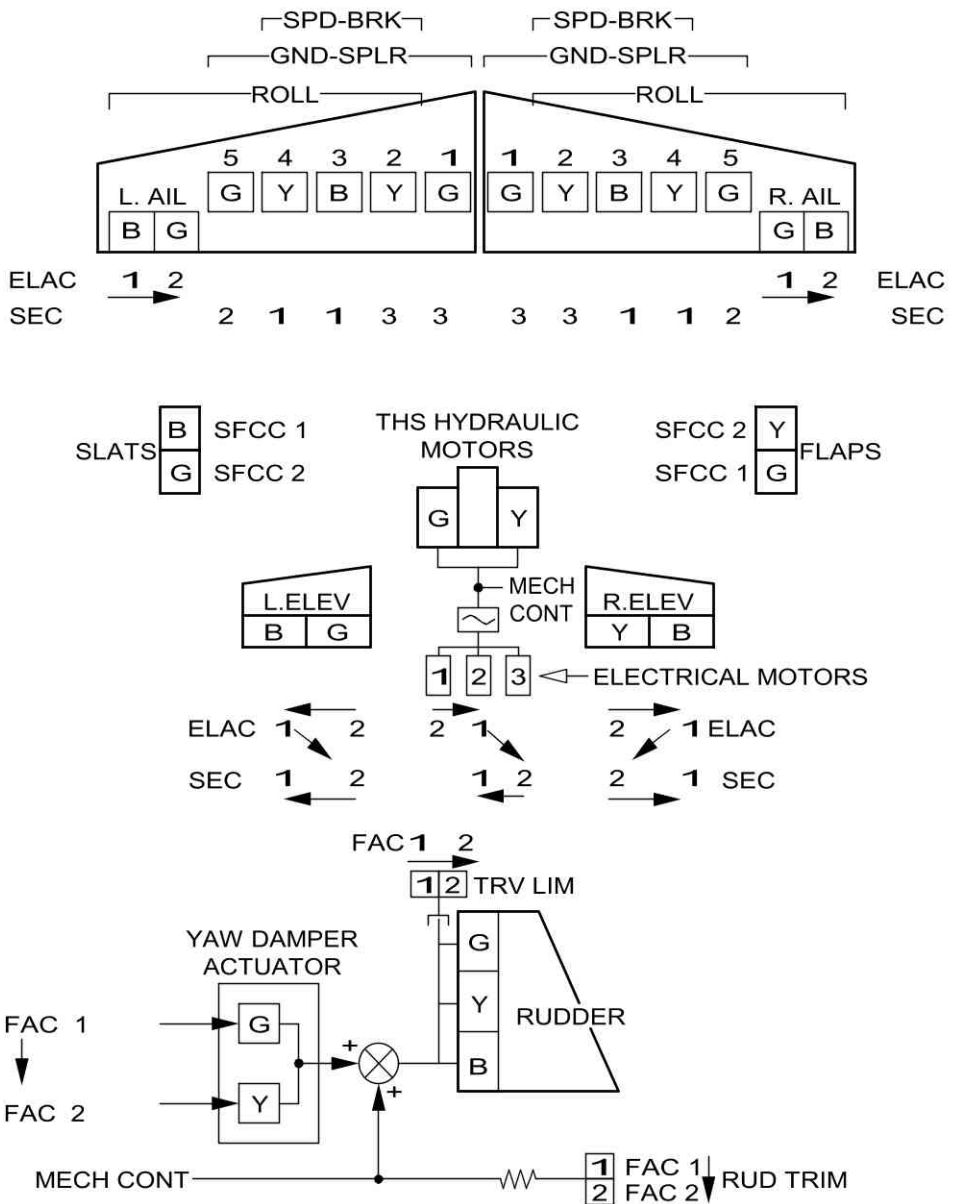
A/THR in managed speed.....USE

HYDRAULIC ARCHITECTURE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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## **OEBPROC-PLP PRELIMINARY PAGES**

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## **OEBPROC-11 "ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight**

<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.00</b>
----------------------------------------------------------------	--------------

<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.01</b>
----------------------------------------------------------------	--------------

## **OEBPROC-17 Dual FM Reset upon Radial Fix Info Entry**

<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.00</b>
------------------------------------------------------	--------------

<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.01</b>
------------------------------------------------------	--------------

## **OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.00</b>
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<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.01</b>
--------------------------------------------------------------------------------	--------------

## **OEBPROC-36 No SRS Engagement During Go Around in the Case of EPR Mode Fault**

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.00</b>
------------------------------------------------------------------------------	--------------

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.01</b>
------------------------------------------------------------------------------	--------------

## **OEBPROC-38 Erroneous Radio Altimeter Height Indication**

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.00</b>
---------------------------------------------------------	--------------

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.01</b>
---------------------------------------------------------	--------------

## **OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**

<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.00</b>
------------------------------------------------------------------------	--------------

<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.01</b>
------------------------------------------------------------------------	--------------

## **OEBPROC-43 F/CTL SPOILER FAULT**

<b>F/CTL SPOILER FAULT.....</b>	<b>43.00</b>
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<b>F/CTL SPOILER FAULT.....</b>	<b>43.01</b>
---------------------------------	--------------

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

L/G GEAR NOT DOWNLOCKED.....	44.00
■ L/G GEAR NOT DOWNLOCKED ■.....	44.01



## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an ENG 1(2) OIL FILTER CLOG ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTG					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTG					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HTG				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HTG				





## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
Criteria: SA Applicable to: B-HTG					
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
Criteria: SA Applicable to: B-HTG					



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB36 Issue 1.0

### NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		36.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HTG					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HTG					





## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

### ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTG				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTG				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTG				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTG				





## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



<b>AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)</b>
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- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

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## OEB43 Issue 2.0

### F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTG				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTG				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*

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## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTG				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTG				





## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

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		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HTH**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	<b>2/2</b>
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date

No filing instructions


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HTH</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HTH</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HTH</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HTH</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HTH</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HTH</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HTH</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HTH</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS	<b>2/2</b>
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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HTH</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

<b>M<sup>(1)</sup></b>	<b>MSN</b>	<b>FSN</b>	<b>Registration Number</b>	<b>Model</b>
	1984	HDA 0151	B-HTH	321-231


(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	1/6
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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	K2113		30 AUG 10	FUSELAGE - REAR FUSELAGE SECTION 16A - DEFINE A321 BASIC STRUCTURE
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	<b>Applicable to: ALL</b>			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	<b>Applicable to: ALL</b>			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	<b>Applicable to: ALL</b>			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	<b>Applicable to: ALL</b>			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	<b>Applicable to: ALL</b>			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	<b>Applicable to: ALL</b>			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	<b>Applicable to: ALL</b>			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	<b>Applicable to: ALL</b>			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	<b>Applicable to: ALL</b>			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	<b>Applicable to: ALL</b>			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+)- STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	<b>Applicable to: ALL</b>			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	<b>Applicable to: ALL</b>			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	<b>Applicable to: ALL</b>			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	<b>Applicable to: ALL</b>			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	<b>Applicable to: ALL</b>			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	<b>Applicable to: ALL</b>			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	<b>Applicable to: ALL</b>			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	<b>Applicable to: ALL</b>			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	<b>Applicable to: ALL</b>			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P1872		30 AUG 10	AIR CONDITIONING - INSTALL CIRCUIT BREAKER FOR REAR CARGO COMPT VALVES FOR EROPS -
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	P3341		30 AUG 10	LANDING GEAR - WHEELS AND BRAKES - INSTALLATION OF MESSIER GOODRICH WHEELS AND BRAKES ON A321
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	J2153		30 AUG 10	FUEL-CERTIFICATION OF FUEL SYSTEM- (LOW PRESSURE SYSTEM) FOR THE OPERATION 0 TO 2 ACTS
	<b>Applicable to: ALL</b>			


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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	<b>Applicable to: ALL</b>			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	<b>Applicable to: ALL</b>			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	<b>Applicable to: ALL</b>			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	<b>Applicable to: ALL</b>			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	<b>Applicable to: ALL</b>			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	<b>Applicable to: ALL</b>			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	<b>Applicable to: ALL</b>			
	K0070		30 AUG 10	AIR CONDITIONING - CARGO COMPARTMENT - VENTILATION - INSTALL SYSTEM IN AFT COMPARTMENT -
	<b>Applicable to: ALL</b>			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	<b>Applicable to: ALL</b>			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	<b>Applicable to: ALL</b>			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	<b>Applicable to: ALL</b>			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	<b>Applicable to: ALL</b>			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	<b>Applicable to: ALL</b>			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	<b>Applicable to: ALL</b>			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	<b>Applicable to: ALL</b>			
	K7727		30 AUG 10	EQUIPMENT/FURNISHINGS - MISCELLANEOUS EMERGENCY EQPT - INSTALL AN HONEYWELL ELT WITH CONTROL PANEL IN COCKPIT
	<b>Applicable to: ALL</b>			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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**GENERAL**


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**GEN-PLP PRELIMINARY PAGES**

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IMPORTANT		

### **SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
 As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

### **TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

#### **PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

#### **PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

### **Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

### **ECAM CLEAR**

DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

### **ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

# USE OF SUMMARIES

## GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $VREF + \Delta VREF$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

## APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

## APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : Index of the back cover page interior                                                                                           |
| C3              | : Index of the back cover page exterior                                                                                           |
| "BLANK"         | : Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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## **ABN-PLP PRELIMINARY PAGES**

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## **ABN-21 Air Conditioning/Ventilation/Pressurization**

<b>CABIN OVERPRESSURE.....</b>	<b>21.01</b>
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## **ABN-22 Auto Flight**

<b>LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset).....</b>	<b>22.01</b>
<b>LOW ENERGY WARNING.....</b>	<b>22.02</b>

## **ABN-24 Electrical**

<b>ELEC EMER CONFIG SYS Remaining.....</b>	<b>24.01</b>
<b>ELEC EMER CONFIG Summary.....</b>	<b>24.02</b>

## **ABN-25 Equipment**

<b>COCKPIT DOOR FAULT.....</b>	<b>25.01</b>
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## **ABN-26 Fire Protection**

<b>■ SMOKE/FUMES REMOVAL ■.....</b>	<b>26.01</b>
<b>■ SMOKE/FUMES/AVNCS SMOKE ■.....</b>	<b>26.02</b>

## **ABN-27 Flight Controls**

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<b>SIDESTICK/RUDDER PEDALS STIFF.....</b>	<b>27.03</b>
<b>RUDDER JAM.....</b>	<b>27.04</b>
<b>STABILIZER JAM.....</b>	<b>27.05</b>

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<b>FUEL LEAK.....</b>	<b>28.02</b>
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<b>ACT UNUSABLE PROC.....</b>	<b>28.06</b>

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<b>HYD G + B SYS LO PR Summary.....</b>	<b>29.02</b>
<b>HYD G + Y SYS LO PR Summary.....</b>	<b>29.03</b>

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RESIDUAL BRAKING PROC.....	32.02
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CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF  
 BLOWER + EXTRACT..... OVRD  
*Cabin air is extracted overboard.*  
 ΔP..... FREQUENTLY MONITOR

● If ΔP >9 PSI  
     PACK 1+2.....OFF  
**LAND ASAP**

Before 10 min from landing:  
 PACK 1+2..... OFF  
 BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that ΔP is zero before opening the doors.
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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The “CAB PR LDG ELEV FAULT” message is displayed on the ECAM
- A “MAP NOT AVAIL” message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.


Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		

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<b>ELEC EMER CONFIG SYS REMAINING</b>				
<b>ELEC EMER CONFIG SYS REMAINING</b>		<b>EMER GEN RUNNING</b>	<b>BAT ONLY</b>	
			<b>IN FLIGHT</b>	<b>ON THE GROUND</b>
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
	AFT CRG ISOL VALVE	Norm	Inop	Inop
FMGS	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only
COM	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	ELAC	N° 1 only	N° 1+ N° 2	N°1+ N°2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop
HYD	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
	ECAM CONT. panel	Norm	Norm	Norm
FLT INS	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



*Continued from the previous page*

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

<sup>(a)</sup> Restored, when speed is below 100 kt.

<sup>(b)</sup> Crew oxygen valve inoperative.


<sup>(c)</sup> Lost, when speed is below 50 kt.

<sup>(d)</sup> Lost 30 s after last engine shutdown.

<sup>(e)</sup> IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

<sup>(f)</sup> For APU start only.

<sup>(g)</sup> Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.

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### ELEC EMER CONFIG SUMMARY

CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK USABLE BY GRAVITY (2T UNUSABLE) <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV											
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94	
DRY runway	2 260	2 340	2 450	2 560	2 670	2 810	2 970	3 550	3 800	4 050	
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.20										
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.95										
CORRECTIONS	+1 000 ft above SL						+10 kt tailwind				
DRY Runway	+3 %						+16 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● If one or more electrical latches (strikes) are faulty:

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● If two pressure sensors are faulty:

Automatic latch release is not available, in case of cockpit decompression.

● If no LED on the CKPT DOOR CONT panel is on:

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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**SMOKE/FUMES REMOVAL**

- EMER EXIT LIGHT.....

ON
- If fuel vapors:
 

CAB FANS.....

ON

PACK 1+2.....

OFF
- If no fuel vapors:
 

CAB FANS.....

OFF

ECON FLOW.....

OFF
- LDG ELEV.....

10 000 FT/MEA
- DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude).....

INITIATE
- ATC.....

NOTIFY
- SMOKE/FUMES/AVNCS SMOKE PROC.....

CONTINUE
- While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.
- At FL 100 or MEA
 

APU MASTER SW (if in ELEC EMER CONF).....

ON

PACK 1+2.....

OFF

MODE SEL.....

MAN

MAN V/S CTL.....

FULL UP

RAM AIR.....

ON

APU MASTER SW.....

OFF
- If smoke persists, open CKPT window:
 

MAX SPEED.....

200 KT

COCKPIT DOOR.....

OPEN

HEADSETS.....

ON

PNF COCKPIT WINDOW.....

OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMERG
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT.....ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATE:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL.....CONSIDER  
 ELEC EMER CONFIG.....CONSIDER  
*Refer to the end of the procedure to Set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING.....CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

- **IF AIR COND SMOKE SUSPECTED:**  
 APU BLEED..... OFF  
 BLOWER..... AUTO  
 EXTRACT..... AUTO  
 CARGO AFT ISOL VALVE..... OFF  
 PACK 1..... OFF  
 ● **If smoke continues:**  
 PACK 1..... ON  
 PACK 2..... OFF  
 ● **If smoke still continues:**  
 PACK 2..... ON  
 BLOWER..... OVRD  
 EXTRACT..... OVRD  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ● **IF CAB EQUIPMENT SMOKE SUSPECTED:**  
 ● **If smoke continues:**  
 EMER EXIT LIGHT..... ON  
 COMMERCIAL..... OFF  
 SMOKE DISSIPATION..... CHECK  
 FAULTY EQPT..... SEARCH/ISOLATE  
 ● **If smoke still continues or if faulty  
equipment confirmed isolated:**  
 COMMERCIAL..... NORM  
 SMOKE/FUMES REMOVAL..... CONSIDER





## **SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

### **UNDETERMINED/AVNCS/ELECTRICAL SMOKE**

- **IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:**  
ELEC EMER CONFIG..... CONSIDER
- **IF SMOKE DISAPPEARS WITHIN 5 MINUTES:**  
NORMAL VENTILATION..... RESTORE

### **TO SET ELEC EMER CONFIG**

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

- **WHEN EMER GEN AVAIL:**

APU GEN.....OFF  
GEN 2..... OFF

### **ELEC EMER CONFIG**

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

- **AT 3 min OR 2 000 ft AAL BEFORE LANDING:**  
GEN 2..... ON  
EMER ELEC GEN 1 LINE.....ON

- **WHEN A/C IS STOPPED:**

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- **If FLAPS jammed > 0**

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt


*Note:*

- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED						
Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	215 kt	195 kt	190 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	215 kt		215 kt	195 kt	190 kt	
S > 3	190 kt		190 kt	190 kt	190 kt	

<b>CAUTION</b>	For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.
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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM

CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

STABILIZER JAM
----------------

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
 The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
 MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

- **IF MAN TRIM AVAIL:**  
 TRIM FOR NEUTRAL ELEV  
*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

- **IF MAN TRIM NOT AVAIL:**  
 FOR LDG.....USE FLAP 3  
*Do not select configuration full so as not to degrade the handling qualities.*  
 GPWS LDG FLAP 3..... ON  
 CAT 2 INOP

FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

CAUTION	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON  
CTR TK L+R XFR..... OFF

- On the lighter side:  
FUEL PUMPS.....OFF
- When fuel is balanced:  
FUEL PUMPS..... ON  
CTR TK L+R XFR..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- A tank is overflowing (due to pipe rupture in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each wing tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK L+R XFR..... OFF

*Each engine is fed via its associated wing tank only.*

WING TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each wing tank.*

#### ■ CASE 1 : IF ONE WING TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side).....IDLE  
 ENG MASTER (engine on leaking side).....OFF  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the wing tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

CTR TK L+R XFR..... ON  
 FUEL X FEED.....USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The wing tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



FUEL LEAK (Cont'd)

ENGINE RESTART..... CONSIDER  
CTR TK XFR (non-leaking side)..... ON

CAUTION	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
---------	----------------------------------------------------------------------------------------------------------------------

■ CASE 2 : IF BOTH WING TANKS DEplete AT A SIMILAR RATE:

A leak from the Center tank or the APU feeding line may be suspected.

● If fuel smell in the cabin:

APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*

● When fuel quantity in one wing tank is less than 3 t (6 600 lb ):

CTR TK L+R XFR..... ON

FOR LANDING

CAUTION	Do not use reversers.
---------	-----------------------

GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF

● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:


If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :

FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE


● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):

BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE




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ACT UNUSABLE PROC		
ACT..... AUTO <i>This stops the pump dry running.</i>		

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## HYD B + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/.77  
 MANEUVER WITH CARE  
 Flight controls remain in normal law.

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR

W (1 000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW/FLAPS SLOW  
 GPWS LDG FLAP 3..... ON  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE** Only one ELEV and two spoilers per wing  
**SPOILERS** Only 2 per wing  
**REVERSER** Only N°1  
**BRAKING** NORMAL  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>										
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94
<b>DRY runway</b>	1 400	1 450	1 520	1 590	1 650	1 740	1 840	2 200	2 350	2 500
<b>WET runway</b>	1 880	1 980	2 090	2 220	2 330	2 450	2 580	2 780	2 960	3 100
<b>CONTA runway</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75									

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 16 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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HYD G + B SYS LO PR SUMMARY

CRUISE	
SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH	
CAT 2 INOP	
SLATS JAMMED/FLAPS SLOW	
ATHR.....	OFF
GPWS LDG FLAP 3.....	ON
● <b>WHEN SPD 200 KT</b> L/G..... GRVTY EXTN	
● <b>WHEN L/G down: USE MAN PITCH TRIM</b> For Flaps extension: SPD SEL..... VFE NEXT- 5KT <i>When in landing CONF: DECELERATE TO CALCULATED VAPP</i>	

LANDING	
<b>FLARE:</b> Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law	
<b>SPOILERS:</b> Only 2 per wing	
<b>REVERSER:</b> Only N°2	
<b>BRAKING:</b> ALTERNATE	
<b>NO NOSE WHEEL STEERING</b>	


GO-AROUND	
NO GEAR RETRACTION. Increased fuel consumption	
● <b>For circuit:</b> MAINTAIN SLATS/FLAPS CONFIGURATION Recommended speed: MAX SPD - 10 kt	
● <b>For diversion:</b> SELECT CLEAN CONFIGURATION If Slats at zero: Normal operating speeds If Slats not at zero: Recommended speed MAX SPD -10 kt	

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
DRY runway	1 520	1 580	1 650	1 730	1 800	1 890	2 000	2 390	2 560	2 720	
WET runway	2 030	2 150	2 270	2 400	2 520	2 660	2 790	3 010	3 200	3 360	
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.80										

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 16 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
<b>LANDING CONF</b>	<b>APPROACH SPEED</b>
Use FLAP 3	VAPP = VREF + 30 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP	
SLATS SLOW / FLAPS JAMMED	
GPWS FLAP MODE.....	OFF
<ul style="list-style-type: none"> <li>● <b>For Flaps extension:</b></li> </ul>	
SPD SEL.....	VFE NEXT - 5KT
When in landing CONF : DECELERATE TO CALCULATED VAPP	
Stabilize at VAPP before L/G down, to be trimmed for approach.	
L/G GRAVITY EXTENSION	

### LANDING

<b>FLARE:</b>	PITCH AUTHORITY REDUCED (No stabilizer). MAN TRIM Unusable Only 1 spoiler per wing – Direct law
<b>SPOILERS:</b>	Only 1 per wing
<b>NO REVERSER</b>	
<b>BRAKING:</b>	BRK Y ACCU PR ONLY (7 applications) MAX BRK PR 1 000 PSI
<b>NO NOSEWHEEL STEERING</b>	

### GO-AROUND

NO GEAR RETRACTION. Increased fuel consumption	
<ul style="list-style-type: none"> <li>● <b>For circuit:</b></li> </ul>	
MAINTAIN SLATS/FLAPS CONFIGURATION	
Recommended speed: MAX SPD - 10 kt	
<ul style="list-style-type: none"> <li>● <b>For diversion:</b></li> </ul>	
<ul style="list-style-type: none"> <li>● <b>If Flaps at zero:</b></li> </ul>	
SELECT CLEAN CONFIGURATION	
Normal operating speeds	
<ul style="list-style-type: none"> <li>● <b>If Flaps not at zero:</b></li> </ul>	
MAINTAIN SLATS/FLAPS CONFIG	
Recommended speed: MAX SPD - 10 kt	


ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
<b>DRY runway</b>	2 050	2 130	2 230	2 330	2 430	2 550	2 700	3 230	3 450	3 680	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.05										
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.00										
<b>CORRECTIONS</b>	<b>+ 1 000 ft above SL</b>					<b>+ 10 kt tailwind</b>					
<b>DRY runway</b>	+ 3 %					+ 16 %					

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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**DOUBLE AOA HEAT FAILURE**

- If icing conditions cannot be avoided:  
One of affected ADRs..... OFF  
NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*



## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

## RESIDUAL BRAKING PROC

● **IN FLIGHT:**

**BRAKE PEDALS.....APPLY SEVERAL TIMES**

*Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.*

● **IF RESIDUAL PRESSURE REMAINS:**

**A/SKID & N/W STRG selector..... KEEP ON**

■ **IF AUTOBRAKE IS AVAILABLE:**

**FOR LANDING..... AUTO/BRK MED**

*Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.*

■ **IF AUTOBRAKE IS NOT AVAILABLE:**

**JUST AFTER TOUCHDOWN.....APPLY BRAKING**

*Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.

Note:     *If tire damage is suspected after landing, inspection of the tires is required before taxi.*

*If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :*

- 1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.*
- 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.*





## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

## LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL SD</b> page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOMELT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.  
 Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.



LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE


- **If NOSE L/G abnormal:**  
 NOSE..... MAINTAIN UP  
*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*  
 BRAKES (compatible with elevator efficiency)..... APPLY  
 ENG MASTERS..... OFF  
*Shutdown the engines before nose impact.*

- **If one MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*At touchdown, shut down both engines.*  
 FAILURE SIDE WING..... MAINTAIN UP  
*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*  
 DIRECTIONAL CONTROL..... MAINTAIN  
*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

- **If both MAIN L/G abnormal:**  
 ENG MASTERS..... OFF  
*Shut down the engines in the flare, before touchdown.*  
 PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

**WHEN A/C STOPPED**

ENG (all) and APU FIRE pushbutton..... PUSH  
*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*  
 ENG (all) and APU AGENT..... DISCH

- **If Evacuation required:**  
 EVACUATION..... INITIATE  
 - All emergency and passenger doors may be used to evacuate the aircraft.  
 - Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

- **If Evacuation not required:**  
 CABIN CREW and PASSENGERS (PA)..... NOTIFY  
*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

#### **F/CTL ALTN LAW**

#### **(PROT LOST)**

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

#### **APPR PROC:**

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

#### ● **FOR L/G GRVTY EXTN (not on the ECAM):**

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### **INOP SYS**

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### **Other INOP SYS**

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT



ADR 1 + 2 + 3 FAULT (Cont'd)


● DURING FINAL APPR

V/S CTL..... FULL UP

Note:     *In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

<b>CAUTION</b>	<i>Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.</i>
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<sup>(1)</sup>    *At slats' extension, full rudder travel authority is recovered.*

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**NAV FM / GPS POS DISAGREE**

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 ° ,
- 0.9 min for latitudes at or above 55 ° and below 70 ° ,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.

- **If the message occurs in climb, cruise, or descent:**  
CHECK navigation accuracy, using raw data.

- **If the check is positive:**  
NAV mode and ND ARC/ROSE NAV may be used.
- **If the check is negative:**  
HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**  
Use the associated FD/AP.
- **If not:**  
Deselect GPS and revert to basic information.
- **If the message occurs during a Non Precision Approach (NPA):**
  - **Overlay approach:**  
SELECT HDG, or TRK, and use raw data.
  - **GPS or RNAV approach:**  
GO AROUND, or fly visual, if visual conditions are met.



EGPWS ALERTS

CAUTION	During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis. During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.
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- **“PULL UP” – “TERRAIN TERRAIN PULL UP” – “TERRAIN AHEAD PULL UP” - “OBSTACLE AHEAD PULL UP”:**

Simultaneously:

AP ..... OFF  
 PITCH..... PULL UP  
*Pull to full backstick and maintain in that position.*  
 THRUST LEVERS..... TOGA  
 SPEED BRAKES lever..... CHECK RETRACTED  
 BANK..... WINGS LEVEL or ADJUST

- **When flight path is safe and the warning stops:**  
 Decrease pitch attitude and accelerate.
- **When speed is above VLS, and vertical speed is positive:**  
 Clean up aircraft as required.
- **“TERRAIN TERRAIN” “TOO LOW TERRAIN”:**  
 Adjust the flight path or initiate a go-around.
- **"TERRAIN AHEAD"- "OBSTACLE AHEAD":**  
 Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.
- **“SINK RATE” “DON’T SINK”:**  
 Adjust pitch attitude and thrust to silence the alert.
- **“TOO LOW GEAR” - “TOO LOW FLAPS”:**  
 Perform a go-around.
- **“GLIDE SLOPE”:**  
 Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
 Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*
- LEVEL A/C ATTITUDE..... HOLD  
 CONSTANT A/C SPEED..... MAINTAIN  
 DISPLAY SYS switch..... AFFECTED SYS  
 DISPLAY DATA switch..... HDG

■ **MCDU INITIALIZATION:**

- DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*
- IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*
- A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*

■ **CDU INITIALIZATION:**

- Depending on the CDU keyboard installed, an “H” may be written on the “5” key:
- **If “H” is written on the “5” key:**
- H KEY.....PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*
- A/C HEADING..... ENTER
- **If “H” is not written on the “5” key:**
- A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG–ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and VMAX.*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 81 t	81 t-68 t	Below 68 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	4.0/70.7	4.0/66.4	4.0/61.5
2	F	7.0/68.9	7.0/64.6	7.0/59.9
1 + F	S	3.5/67.6	3.0/63.8	3.0/58.6
1	S	7.5/65.5	7.5/61.4	7.5/56.5
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200 -FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

■ **If at least one ADR is reliable:**

Faulty ADR(s).....OFF  
 REMAINING AIR DATA.....CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

■ **If affected ADR(s) cannot be identified or all ADRs are affected:**

ONE ADR.....KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs.....OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF.....USE FLAP 3

APP SPD.....VLS +10

LDG DIST PROC.....APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

■ **To return to departure airport:**

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

■ **To accelerate and clean up after takeoff:**

Accelerate and clean up the aircraft in level flight:

THRUST.....CLB

FLAPS.....RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

■ **Other cases:**

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables) for flight continuation.*

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	270 kt	8.5/CLB	9.0/CLB	10.0/CLB
FL 50 - FL 100		8.0/CLB	8.0/CLB	9.0/CLB
FL 100 - FL 150		7.0/CLB	7.0/CLB	8.0/CLB
FL 150 - FL 200		6.0/CLB	6.0/CLB	6.5/CLB
FL 200 - FL 250	300 kt	4.0/CLB	4.0/CLB	4.0/CLB
FL 250 - FL 280		3.5/CLB	3.0/CLB	3.0/CLB
Above FL 280	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.  
 When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200-FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 280	M 0.76	-1.0/IDLE	-1.5/IDLE	-2.0/IDLE
FL 280-FL 200	300 kt	-0.5/IDLE	-1.5/IDLE	-2.5/IDLE
FL 200 - FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-1.5/IDLE
Below FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-2.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.0/IDLE	2.0/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.0/63.4	5.0/59.4	5.0/54.6
1	S	7.5/65.6	7.5/61.4	7.5/56.6
1+F <sup>(1)</sup>	S	3.5/67.6	3.0/63.8	3.0/58.6
2	F	7.0/68.5	7.0/64.7	7.0/59.9



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	4.0/74.8	4.0/71.0	4.0/65.8

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

### FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	2.0/60.0	2.0/56.0	1.5/51.6

### FLYING TECHNIQUE TO STABILIZE SPEED:

Adjust pitch in order to fly the required flight path.  
 When target pitch is reached, flying intended flight path, adjust thrust to target.  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



AIR DUAL BLEED FAULT (Cont'd)

- If engine bleed recovery was not successful, or if one pack is inoperative :
  - X BLEED..... CHECK OPEN
  - DESCENT TO FL200/MEA.....CONTINUE
  - Descend rapidly to FL 200, to recover the bleed supply from the APU*
  - APU.....START
  - Start the APU during the descent.*
- **AT, OR BELOW, FL200 :**
  - WING A.ICE..... OFF
  - APU BLEED must not be used for wing anti-ice.*
  - APU BLEED..... ON
  - MAX FL200
  - AVOID ICING CONDITIONS
- **IF ICE ACCRETION**
  - APPR SPD.....VLS + 10 KT
  - LDG DIST PROC..... APPLY
  - Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 60 000 kg/132 000 lb	-2.5
70 000 kg/154 000 lb	-1.5
80 000 kg/176 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.4 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**

CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**

APU (IF AVAIL).....START

● **WHEN BELOW FL 200**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
94	251	261	271
92	248	258	268
88	242	252	262
86	239	249	259
84	236	246	256
82	233	243	253
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 700 ft/min

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 and L/G DOWN) will be approximately 1.1 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.  
MIN APPR SPEED.....160 KT



## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE

*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**

- **When in CONF 3 and VAPP:**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN

*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*

- **When L/G downlocked**

L/G lever..... DOWN

APPROACH SPEED..... ADJUST

*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*

GND SPLR..... ARM

MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**

PARKING BRK..... ON

ATC..... NOTIFY

FIRE pushbutton (ENG and APU)..... PUSH

AGENTS (ENG and APU)..... DISCH

*Engine Agent 2 is not available.*

- **If Evacuation required:**

EVACUATION..... INITIATE

ELT  ..... CHECK EMITTING

*If not, switch on the transmitter.*

- **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.*  
*If that causes a strong crosswind, ditch into the wind.*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING

ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*

**ENG DUAL FAILURE - NO FUEL REMAINING**

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON THRUST LEVERS..... IDLE FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....240 KT/GREEN DOT


*Initially, fly 240 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 700 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE ATC..... NOTIFY CREW OXY MASKS (Above FL 100)..... ON CABIN AND COCKPIT..... PREPARE SIGNS..... ON COMMERCIAL..... OFF

USE RUDDER WITH CARE

● **WHEN BELOW FL 150**

RAM AIR..... ON

**COMMON ACTIONS FOR THE APPROACH**

**APPROACH PREPARATION**

*Note: Final descent slope, when configured (CONF 3; L/G DOWN), will be approximately 1.1 N/m per 1 000 ft (with no wind).*

BARO..... SET CREW MASKS/OXY SUPPLY (below FL 100)..... OFF



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt.*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)
  - When in CONF 3 and VAPP  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - When L/G downlocked  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*  
  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

AT 2 000 FT AGL

CABIN.....NOTIFY FOR LANDING


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

AFTER LANDING

- When the aircraft has stopped :  
PARKING BRK.....ON  
ATC.....NOTIFY
  - If Evacuation required :  
EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - If Evacuation not required :  
CABIN CREW and PASSENGERS (PA).....NOTIFY





ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell*  
*If that causes a strong crosswind, ditch into the wind..*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF

AFTER DITCHING


ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*

## ENG RELIGHT (IN FLIGHT)

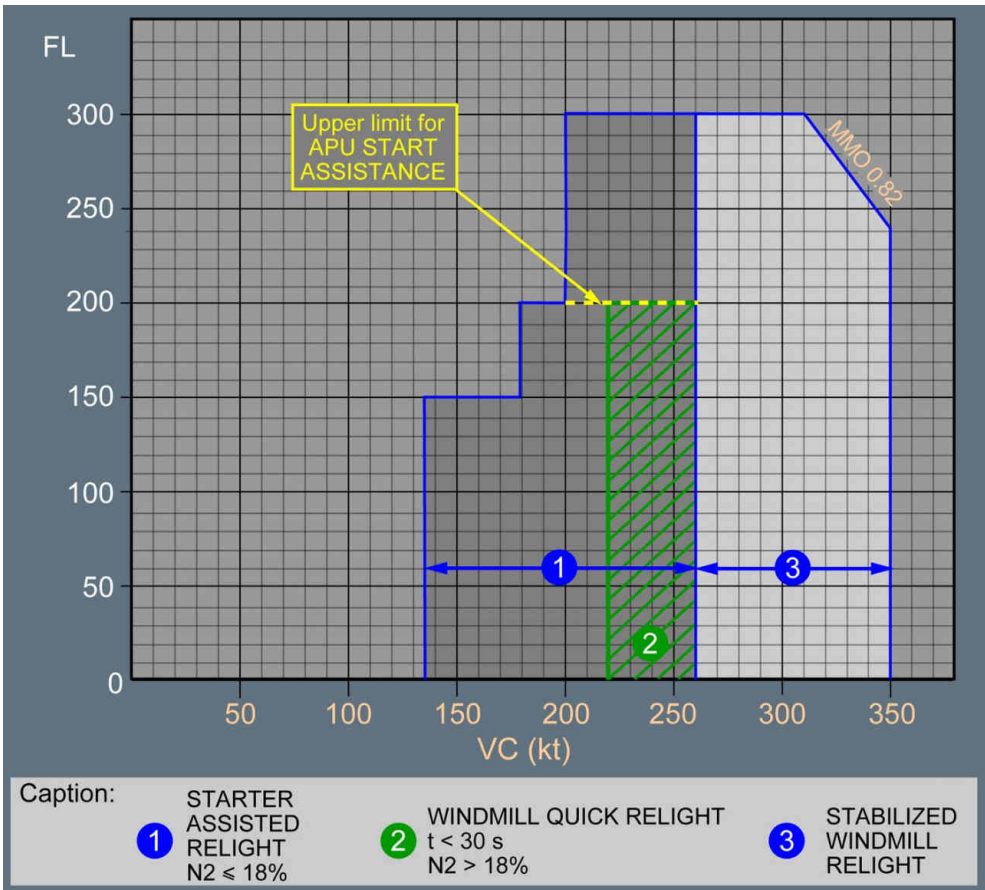
- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.

Engine light up should be achieved within 30 s after fuel flow increases.

- **When idle is reached (AVAIL indication pulses in green) :**
- |                                                                                                       |             |
|-------------------------------------------------------------------------------------------------------|-------------|
| ENG MODE SEL.....                                                                                     | NORM        |
| TCAS MODE SEL  ..... | check TA/RA |
- Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.
- |                   |         |
|-------------------|---------|
| Affected SYS..... | RESTORE |
|-------------------|---------|

- **If no relight :**
- |                            |     |
|----------------------------|-----|
| ENG MASTER (affected)..... | OFF |
|----------------------------|-----|
- Wait 30 s before attempting a new start (to drain the engine).





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

———— ASSOCIATED PROCEDURES ————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION	External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :
---------	---------------------------------------------------------------------------------------------------------------------------------------------

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM



## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1  $\geq$  5 units, N2  $\geq$  5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	76	74	71	68	64	61	58	54
5	76	74	71	68	64	61	56	52
10	76	74	71	68	64	59	54	
15	76	74	71	67	61	57	52	
20	76	74	69	64	59	54		
25	76	71	66	61	56			
30	73	68	64	59	54			
35	69	65	61	57	52			
40	66	62	59	55				
45	63	60	57					
50	60	57						
55	57							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH  
ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### COCKPIT PROCEDURES

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

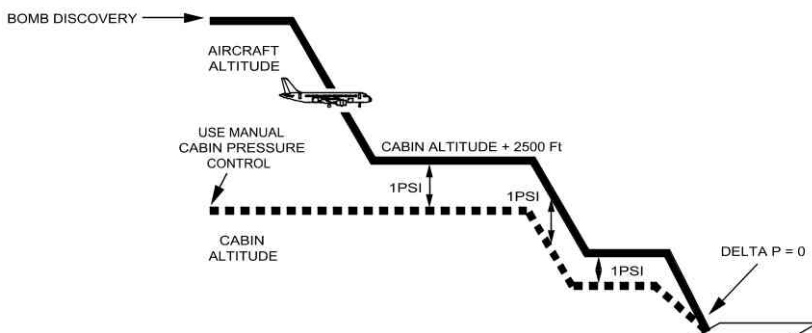
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE
<i>Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.</i>	
NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN
<i>Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.</i>	
DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN





BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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BOMB ON BOARD (Cont'd)

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

*The cabin crews must command passengers to switch off all portable electronic devices.*

BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

● If the bomb can be moved:

RH AFT CABIN DOOR SLIDE..... DISARM

LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

CAUTION

DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

BOMB INDICATION LINE..... POSITION

*Note:* *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

BOMB..... MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

CAUTION

Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.





## BOMB ON BOARD (Cont'd)

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

**CAUTION**

**DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.**

Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

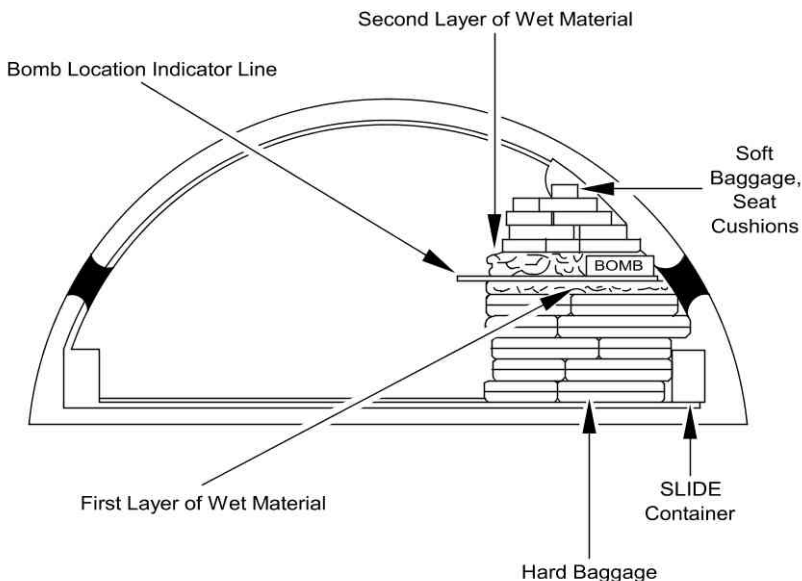
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



PASSENGERS.....MOVE/ADVISE


*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW.....NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
<i>Evacuate through normal and emergency exits on the opposite side of the “bomb” location. Do not use the door just opposite the “bomb”.</i>		
<i>Use all available airport facilities to disembark without delay.</i>		



## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### **PREPARATION**

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### **AT 2 000 FT AGL**

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### **AT 500 FT AGL**

BRACE FOR IMPACT..... ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### **AFTER DITCHING**

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT.....ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE



	FORCED LANDING (Cont'd)	
--	-------------------------	--

ELT..... CHECK EMITTING <i>If not, switch on the transmitter.</i>		
■ <b>If Evacuation not required:</b>		
CABIN CREW and PASSENGERS (PA)..... NOTIFY		

## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


### WHEN DESCENT ESTABLISHED

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

**CAUTION** Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: The recommendation is to descend with the autopilot engaged.  
 Use of the autopilot is also permitted in EXPEDITE mode .

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.



OVERWEIGHT LANDING

**LDG CONF..... AS REQUIRED**

*Use the ECAM flap setting, if required for abnormal operations. In all other cases :*

- *FULL is preferred for optimized landing performance*
  - *If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.*
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.*

Note:     *At very high weights, VFE CONF1 is close to VLS clean. To select CONF1, deselect A/THR, decelerate to (or slightly below) VLS and select CONF1 when below VFE. When established at CONF1, the crew can re-engage the A/THR and use managed speed again*

**LDG DIST.....CHECK**

**PACK 1 and 2.....OFF or supplied by APU**

*Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.*

● **In the final approach stages**

**TARGET SPEED..... VLS**

*Reduce the selected speed on the FCU to reach VLS at runway threshold.*

*Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).*

● **At main landing gear touchdown**

**REVERSE THRUST..... USE MAX AVAILABLE**

● **After nosewheel touchdown**

**BRAKES.....APPLY AS NECESSARY**

*Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.*

● **Landing complete**

**BRAKE FANS ..... ON**

*Be prepared for tire deflation, if temperatures exceed 800 °C.*

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	92	88	82	76	70	65	60	55
15	92	88	82	76	70	65	60	55
20	92	88	82	76	70	65	60	55
25	92	87	80	75	69	64	59	
30	92	85	79	73	68			
35	88	82	76	70	65			
40	85	79	73	68				
45	82	75	70					
50	78	72						
55								

# STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**  
*This will reduce angle of attack*

Note:     *In case of lack of pitch down authority, reducing thrust may be necessary.*

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

Note:     *In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

**SPEEDBRAKES..... CHECK RETRACTED**  
**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

Note:     *If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

# STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**  
**BANK..... WINGS LEVEL**

Note:     *When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.*

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.*  
*Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- If the aircraft enters a volcanic ash cloud:
 

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
ECON FLOW.....	OFF

*Note:* If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

If airspeed is unreliable or lost, Refer to the QRH ABN 34 Unreliable Speed Indication / ADR Check Proc procedure.

*Note:* If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

*Note:* If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

Due to the increased noise level, pay particular attention to visual warnings.



## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

*Note:*

- When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.
- In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

WINDSHEAR

A red flag “WINDSHEAR” is displayed on each PFD associated with an aural synthetic voice “WINDSHEAR” repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

■ **At takeoff**

■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

■ **If after V1**

THR LEVERS.....TOGA  
 REACHING VR.....ROTATE  
 SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*

*Note:*

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.





## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*


Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

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WINDSHIELD/WINDOW ARCING		
<p>Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL</p> <p><i>Pull the circuit breaker of the affected window/windshield heating system, in case of :</i></p> <ul style="list-style-type: none"><li>- <i>Electrical arcing of the cockpit windshield/window, or</i></li><li>- <i>Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.</i></li></ul> <p><i>On the rear C/B panel :</i></p> <ul style="list-style-type: none"><li>• ANTI ICE L WSHLD C/B AF10 (123VU)</li><li>• ANTI ICE R WSHLD C/B AF03 (123VU)</li><li>• ANTI ICE/WINDOWS L C/B X14 (122VU)</li><li>• ANTI ICE/WINDOWS R C/B W14 (122VU)</li></ul>		





## WINDSHIELD/WINDOW CRACKED

DIAGNOSIS OF INNER PLY.....PERFORM

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

MAX FL.....230/MEA

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

CAB PRESS MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


CAB PRESS MODE SEL.....AUTO

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

CAB PRESS MODE SEL.....MAN

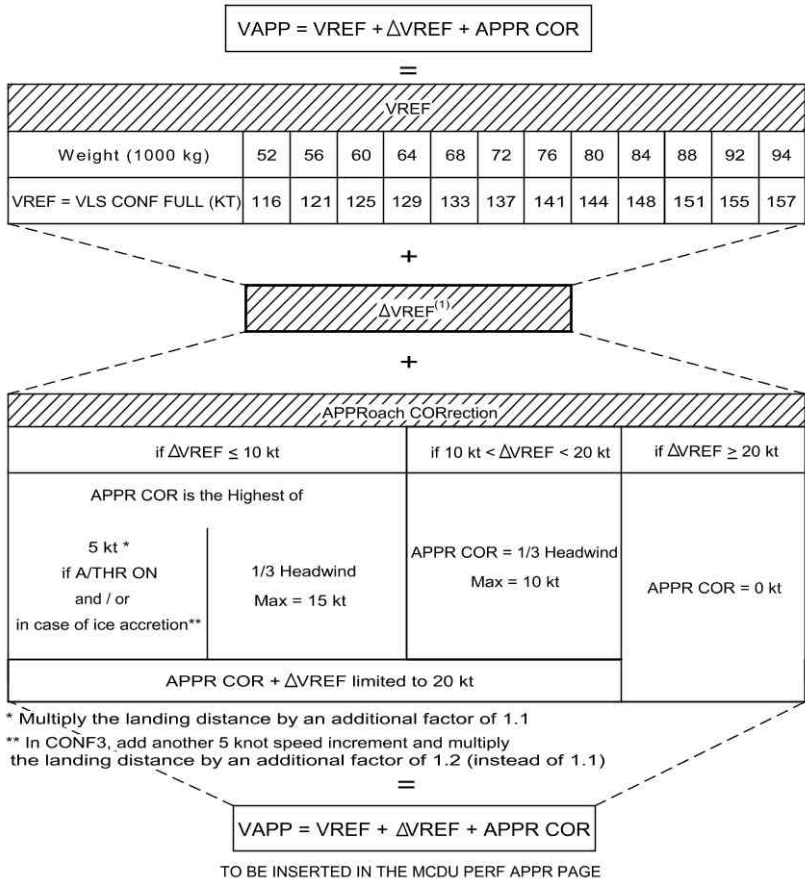
MAN V/S CTL.....FULL UP

*Due to the increased noise level, pay particular attention to visual warnings.*

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<b>ECAM ADVISORY CONDITIONS</b>			
SYSTEM	CONDITIONS	RECOMMENDED ACTION	
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)	
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control	
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control	
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.	
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>	
	Fuel temp greater than 45 °C in wing tank	GALLEY (OFF)	
	Fuel temp lower than -40 °C in wing tank	Consider descending to a lower altitude, and/or increasing Mach to increase TAT.	
APU	EGT > EGT MAX -33 °C (inhibited during APU start)		
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.	
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.	
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.	
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <i>Low Speed-</i> Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <i>High Speed-</i> Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>	
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.	
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.	
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).	

## VAPP CALCULATION

### VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION



(1) Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables

#### EXAMPLE OF VAPP CALCULATION:


Failure : ALTN LAW  
 Flight Conditions : Autothrust ON, ice accretion  
 Landing Configuration : CONF 3  
 Headwind : 12 kt  
 Landing Weight/CG : 60 t  
 VREF determined from the landing weight : 125 kt  
 VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt} / 3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR\ CORR = 125 + 10 + 10 = 145$  kt

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<b>USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES</b>
---------------------------------------------------------

## USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors “WITHOUT REV”** when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors “WITH REV”** when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note:      *Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.*

## LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

## LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)


Compute the LDG DIST:

- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways /A/THR ON / No wind / WITHOUT REV. / Without ice accretion:


FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.60
	3	6			1.75
	3	10			1.40x1.75x1.1=2.70

VREF = 131 kt. Therefore  $VAPP = 131 + 10 + 5 = 146$  kt..

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FAILURES	Flaps Lever Position for Landing	$\Delta$ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S $\geq$ 1)	3	30			1.95*
RESULT	3	30			1.95

VREF = 140 kt. Therefore VAPP = 140+30 = 170 kt.

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**LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY**

DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.35 1.50	1.30 1.45
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.75 2.75	2.75 2.75
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.80 2.00	N/A N/A
	EMER ELEC CONF	3	10	2.75	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	30	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.25*
	S>3	3	5	1.25*	1.20*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.55	1.45 1.55
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.35 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.65	1.35 1.50
	SEC 1+2+3 FAULT	3	10	1.65	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.25*



*Continued from the previous page*


DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.45	1.30 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	GREEN + BLUE	3	25	1.85	1.75
	GREEN + YELLOW	3	30	2.50	N/A
	BLUE + YELLOW	3	10	1.70	1.65
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.60 1.75	1.50 1.60
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.30 1.45
	IR 1+2+3 FAULT	3	10	2.45	2.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.25*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.30*
ENG	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.35	1.15 1.25
	DC EMER CONF	FULL 3	- 6	2.20 2.20	2.20 2.20
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	N/A N/A
	EMER ELEC CONF	3	10	2.20	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.85*
	FLAPS<1				
	S<1	3	45	2.00*	1.75*
	S≥1	3	30	1.70*	1.50*
	1≤FLAPS<2				
	S<1	3	30	1.70*	1.50*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.55*	1.40*
	1≤S≤3	3	10	1.30*	1.20*
	S>3	3	5	1.20*	1.10*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.25*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.40 1.55	1.25 1.35
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.20*





*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.15 1.30
	GREEN + BLUE	3	25	1.95	1.80
	GREEN + YELLOW	3	30	2.05	N/A
	BLUE + YELLOW	3	10	1.80	1.70
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.35	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.20
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
NAV	IR 1+2+3 FAULT	3	10	1.75	1.75
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.35*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.30*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.30*	1.75* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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		30 MAR 12

<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.15 1.25
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.90 1.95
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	N/A N/A
	EMER ELEC CONF	3	10	1.95	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.75*
	FLAPS < 1				
	S<1	3	45	2.00*	1.65*
	S≥1	3	30	1.70*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.60*	1.35*
	S≥1	3	15	1.40*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.50*	1.30*
	S≥1	3	10	1.30*	1.10*
	FLAPS=3				
	S<1	3	25	1.45*	1.25*
	1≤S≤3	3	10	1.25*	1.05*
	S>3	3	5	1.15*	1.00*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.10*	1.00*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.30 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.25
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.15
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.25*	1.05*



*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.10 1.20
	GREEN+BLUE	3	25	1.80	1.65
	GREEN + YELLOW	3	30	2.00	N/A
	BLUE + YELLOW	3	10	1.75	1.55
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
NAV	IR 1+2+3 FAULT	3	10	1.35	1.35
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.30*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.25*	1.05*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.25*	1.70* 1.15*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15


- <sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- <sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- <sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- <sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.


The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:



- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>				
ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset	
21	<u>VENT</u> AVNCS SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B Y 17 on 122VU</li><li>- Wait 1 s before pushing the C/B.</li></ul>	
22	<u>AUTO FLT</u> FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul>	
22	<u>AUTO FLT</u> FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s</li><li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"><li>- RE-ENTER the barometer altimeter setting value, if necessary.</li></ul>	




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G01 on 49VU, M06 on 121VU. G02 on 49VU, M07 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: M06, M07, G01, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<b>On ground, or in flight:</b> Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT & PURS CAPT sw to the CAPT only position. Wait for 3 s. <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M07 on 121VU.</li> </ul> </li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M06 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M07, G02</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<b>On ground, or in flight:</b> The flight crew must reset all the RMPs one after the other via the RMP control panel: <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP* in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>





*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<div><div><b>On ground, or in flight</b><ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul></div><div><div><b>CAUTION</b></div><div>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</div></div><div><b>Note:</b> If both ELACs are failed, reset one ELAC after the other.</div></div>
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<div><div><b>WARNING</b></div><div>Do not reset more than one computer at a time.</div></div> <div><b>Note:</b> If a reset is performed, the flight crew must then perform a flight controls check.</div>
	ELAC or SEC malfunction	ELAC or SEC	<div><div><b>WARNING</b></div><div><div>Do not reset more than one computer at a time.</div><div><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul></div></div><div><b>Note:</b><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></div></div>
28	Loss of fuel quantity indication	FQIC	<div><div><b>On ground, or in flight:</b><ul style="list-style-type: none"><li>- Pull the C/B of the affected channel:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the C/B.</li></ul></div><div><b>Note:</b> The fuel quantity indication will be re-established within 1 min.</div></div>
31	FWS FWC 1(2) FAULT	FWC	<div><div><b>On ground:</b> Pull, then push, the C/B of the affected FWC:<ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul>Wait 50 s after pushing the C/Bs.</div><div><b>In flight:</b> Pull, then push, the C/B of the affected FWC:<ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul></div></div>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	BRAKES SYS 1(2) FAULT or BRAKES BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight</p> <p><u>Note:</u>    After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>    After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	WHEEL N.W STEER FAULT or WHEEL N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>    If during taxi, when the aircraft is moving, <u>WHEEL N.W STEER FAULT</u> or <u>WHEEL N/W STRG FAULT</u> ECAM alert appears along with the NW STRG DISC memo, the flight crew may attempt to perform only one BSCU reset. If the mentioned alert and memo disappear after this BSCU reset, continue the flight.</p> <p><u>Note:</u>    After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	L/G LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:               <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:               <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>



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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B K10 on 121VU.</li> <li>- Wait 5 s, then push the C/B.</li> </ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B 35 MG on 2001VU, aft cabin,</li> <li>- Wait 30 s, then push the C/B 35 MG.</li> </ul>
46	ATSU Malfunction	ATSU	<p>An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus.</p> <b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li> <li>- Wait 5 s, then:</li> <li>- Push the C/Bs in the following order: L15, L16.</li> </ul>

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# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits:
  - AUTOLAND (HWC30 / TWC10 / XWC20)
  - MANUAL LAND (HWC40 / TWC10 / XWC25)
  - OEI ROLLOUT (IDLE REV ONLY XWC15)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## **RNAV (GNSS) / RNAV (RNP) APPROACH**

### ● **APPROACH PREPARATION**

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● **APPROACH GUIDANCE**

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● **AFTER COMMENCING APPROACH: NAVIGATION ALERTS**

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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## COLD WEATHER / DE-ICING - FLIGHT PREPARATION

### ● REVIEW

- ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
- The available or desirable type of De-icing/Anti-icing fluid(s) and respective mixture ratio.
- The location and method of de-icing, the supplier and KA priority.
- Runway surface and braking conditions (Friction Index).
- Length of expected or occurring delays.
- Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).

### ● DETERMINE

- Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
- Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
- Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
- Max ZFW and, if limiting, advise Load Control.
- Takeoff alternate (as necessary) within 340 nm.

### ● CONFIRM

- Slot time (if any).
- Boarding time (allowing for possible LMCs).
- If de-icing at the gate - the scheduled sequence/time.
- If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

## COLD WEATHER / DE-ICING - COCKPIT PREPARATION

### ● SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)

IRS..... Align early (15 mins)  
Pack 1 (then 2)..... ON

Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)

Probe/Window Heat.....ON, prior to external inspection

### ● PERFORMANCE

- Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
- Cold Weather Altimetry.
- Landing Distance: for possible immediate return.

### ● BRIEFING

- Tyre flat spots may cause nose wheel vibration on takeoff.
- Taxi-route (LVP) and speeds.
- Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
- Review Ground De-icing procedures. Refer to PRO-SUP-91-30.

### ● PA

- Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	





## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

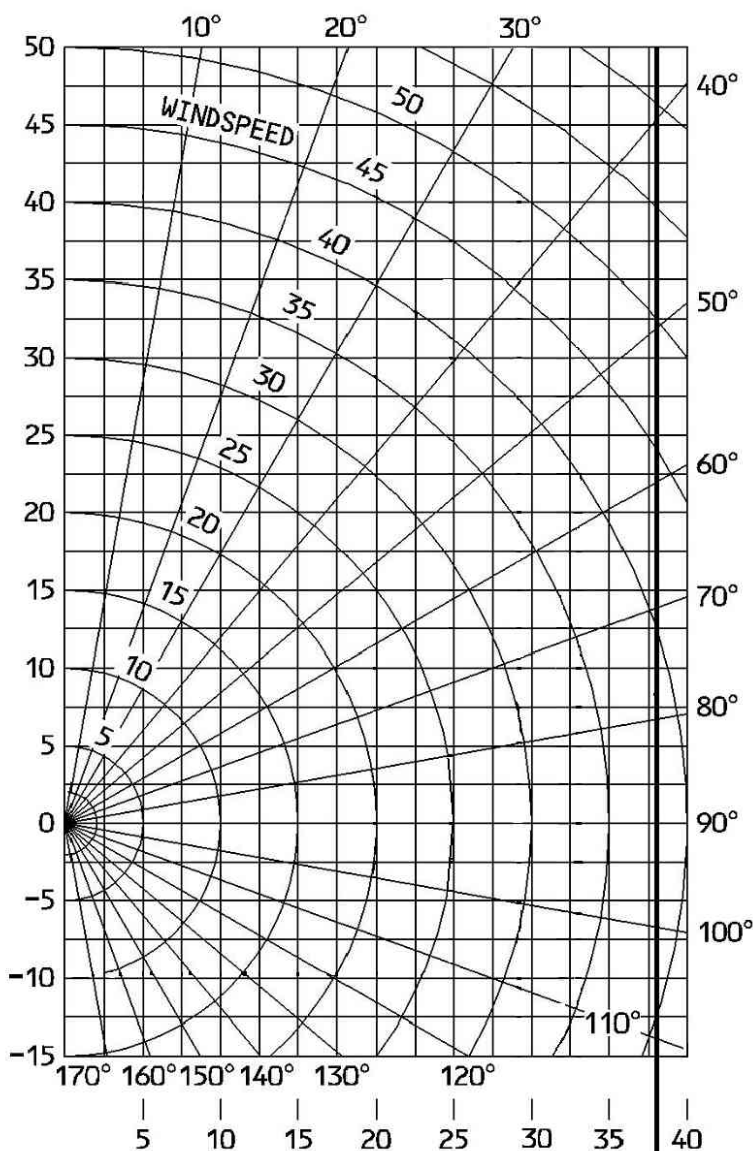
- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

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## WIND COMPONENT CHART - A321



### Weather LIMITS:

SO 1000' / 3000m 10 knots x-wind

JFO 500' / 2000m 15 knots x-wind

FO ≥ CAT I 20 knots x-wind

CAT II Autoland  
30 knots headwind  
20 knots x-wind  
10 knots tailwind  
15 knot x-wind limit  
for OEI Rollout with  
IDLE reverse only.

CAT II No Autoland  
40 knots headwind  
25 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A321

SYS	FAILURE		CODE	SYS	FAILURE		CODE		
ELEC	AC BUS 1		01	HYD	GREEN		01		
	DC BUS 2		02		BLUE		02		
	DC ESS BUS if there is no ice accretion		03		YELLOW		03		
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04		
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05		
	DC EMER CONFIG		06		BLUE + YELLOW		06		
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT		01		
	EMER ELEC CONFIG		08		if there is ice accretion				
	S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
FLAPS < 1		S < 1	02	AUTO BRK FAULT		02			
			S ≥ 1	03	NAV	IR 1+2+3 FAULT		01	
1 ≤ FLAPS < 2		S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02			
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	03		
2 ≤ FLAPS < 3		S < 1	06	BLEED			DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01
			S ≥ 1		07				
FLAP = 3		S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)		01	
		1 ≤ S ≤ 3	09			REV UNLOCK with buffet (CONF 3)		02	
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03			
F/CTL		ONE SPLR FAULT		01					
		TWO SPLR FAULT		02					
		THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04						
	SEC 1 or SEC 3 FAULT		05						
	SEC 2 FAULT		06						
	SEC 2 + 3 FAULT		07						
	SEC 1 + 3 FAULT		08						
	SEC 1 + 2 FAULT		09						
	RUDDER JAM		10						
	SEC 1 + 2 + 3 FAULT		11						
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12						

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**IN FLIGHT PERFORMANCE**

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SPEEDS

OPERATING SPEEDS (KT)					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
52	130	168	188	121	116
56	135	174	194	125	121
60	140	180	200	130	125
64	144	186	206	134	129
68	149	192	212	138	133
72	153	197	218	142	137
76	157	203	224	146	141
80	161	208	230	150	144
84	165	213	236	154	148
88	169	218	242	157	151
92	173	223	248	161	155
94	175	226	251	163	157

(1) Above FL 200 add 1 kt per additional 1 000 ft.

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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

W(1000Kg)	52	56	60	64	68	72	76	80	84	88	92	94
VLS CONF FULL (KT)	116	121	125	129	133	137	141	144	148	151	155	157
VLS CONF 3 (KT)	121	125	130	134	138	142	146	150	154	157	161	163

+

CORRECTION

5KT <sup>(1)</sup>	1/3 HEADWIND (EXCLUDING GUST) MAX=15KT
WHICHEVER IS HIGHER	

=

VAPP

$V_{APP}^{(2)} = \text{MAX}(VLS + 5Kt^{(1)}; VLS + W_{IND} \text{ CORR})$

1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
  2. In case of ice accretion, Vapp must not be lower than:
    - VLS + 5 kt in CONF FULL
    - VLS + 10 kt in CONF 3
- In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		860	900	940	980	1020	1070	1150	1370	1470	1570
	WET		1110	1180	1250	1330	1400	1470	1540	1670	1770	1860
	COVERED WITH	STANDING WATER	1550	1660	1760	1880	1990	2080	2200	2310	2420	2520
		SLUSH	1490	1580	1670	1770	1870	1980	2070	2170	2280	2370
		COMPACTED SNOW	1390	1460	1530	1600	1670	1730	1790	1850	1920	1980
		ICE	2780	2910	3050	3190	3310	3440	3560	3700	3830	3950
CORRECTION ON ACTUAL LANDING DISTANCE												
RUNWAY CONDITION	dry runway	wet runway	runway covered with									
			standing water	slush	compacted snow		ice					
per 1 000 ft above SL	+3 %	+4 %	+4 %		+5 %		+4 %			+5 %		
per 10 kt headwind	No correction for headwind due to wind correction on approach speed											
per 10 kt tailwind	+16 %	+21 %	+22 %		+21 %		+16 %			+26 %		
2 reversers operative	-5 %	-8 %	-17 %		-16 %		-11 %			-29 %		
Per 5 kt speed increment (and no failure) add 8 % (all runways)												

Note: - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

EXAMPLE: Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 74 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 1 020 m

Read from the Corrections table,  
Pressure altitude correction: 3 x 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt no reversers) = 1020 x 1.06 x 1.08 = 1 170 m.



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**LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL**

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		820	850	890	930	970	1020	1080	1290	1380	1470
	WET		1040	1100	1160	1230	1290	1360	1430	1540	1640	1720
	COVERED WITH	STANDING WATER	1430	1530	1640	1740	1840	1940	2030	2140	2240	2340
		SLUSH	1390	1470	1560	1640	1730	1820	1920	2020	2120	2210
		COMPACTED SNOW	1310	1380	1440	1510	1570	1630	1680	1750	1810	1860
		ICE	2590	2720	2850	2970	3090	3210	3320	3450	3580	3690

CORRECTION ON ACTUAL LANDING DISTANCE								
RUNWAY CONDITION	dry runway	wet runway	runway covered with					
			standing water	slush		compacted snow	ice	
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %		+4 %	+4 %	
per 10 kt headwind	No correction for headwind due to wind correction on approach speed							
per 10 kt tailwind	+16 %	+21 %	+24 %		+22 %		+16 %	+27 %
2 reversers operative	-4 %	-8 %	-16 %		-15 %		-11 %	-28 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)								

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW =74 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 970 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 970 × 1.06 × 1.08 = 1 120 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		MODE	54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND
RUNWAY CONDITION												
DRY		MED LOW	1340 1920	1440 2100	1550 2290	1650 2460	1810 2640	1970 2810	+5 +3	0 0	+13 +15	-2 -2
WET		MED LOW	1410 1920	1540 2100	1690 2290	1830 2460	2010 2640	2200 2810	+6 +3	-3 0	+17 +15	-3 -2
COVERED WITH	STANDING WATER	MED LOW	1770 1900	1990 2090	2210 2300	2410 2490	2640 2720	2860 2940	+6 +4	-17 0	+21 +18	-4 -2
	SLUSH	MED LOW	1700 1860	1890 2030	2100 2220	2290 2400	2490 2590	2690 2790	+7 +5	-16 0	+21 +17	-3 -2
	COMPACTED SNOW	MED LOW	1580 1870	1700 2050	1830 2230	1940 2390	2060 2560	2170 2730	+6 +4	-12 0	+15 +15	-2 -2
	ICE	MED LOW	2980 3000	3240 3260	3530 3550	3780 3800	4040 4060	4290 4320	+6 +5	-29 -26	+25 +26	-4 -4

- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	
RUNWAY CONDITION	MODE											
DRY		MED LOW	1280 1830	1370 1990	1460 2150	1530 2300	1660 2450	1800 2590	+3 +3	0 0	+13 +14	-1 -2
WET		MED LOW	1330 1830	1440 1990	1560 2150	1670 2300	1820 2450	1980 2590	+4 +3	-2 0	+16 +14	-2 -2
COVERED WITH	STANDING WATER	MED LOW	1660 1810	1830 1980	2020 2150	2190 2310	2400 2490	2580 2660	+4 +4	-16 0	+20 +18	-3 -2
	SLUSH	MED LOW	1590 1770	1760 1930	1940 2080	2080 2220	2270 2380	2440 2540	+5 +5	-16 0	+20 +16	-3 -2
	COMPACTED SNOW	MED LOW	1500 1780	1600 1940	1710 2090	1800 2230	1890 2380	1970 2520	+4 +4	-11 0	+14 +14	-2 -2
	ICE	MED LOW	2790 2810	3030 3050	3270 3290	3490 3510	3720 3740	3940 3960	+5 +5	-28 -26	+25 +26	-4 -4

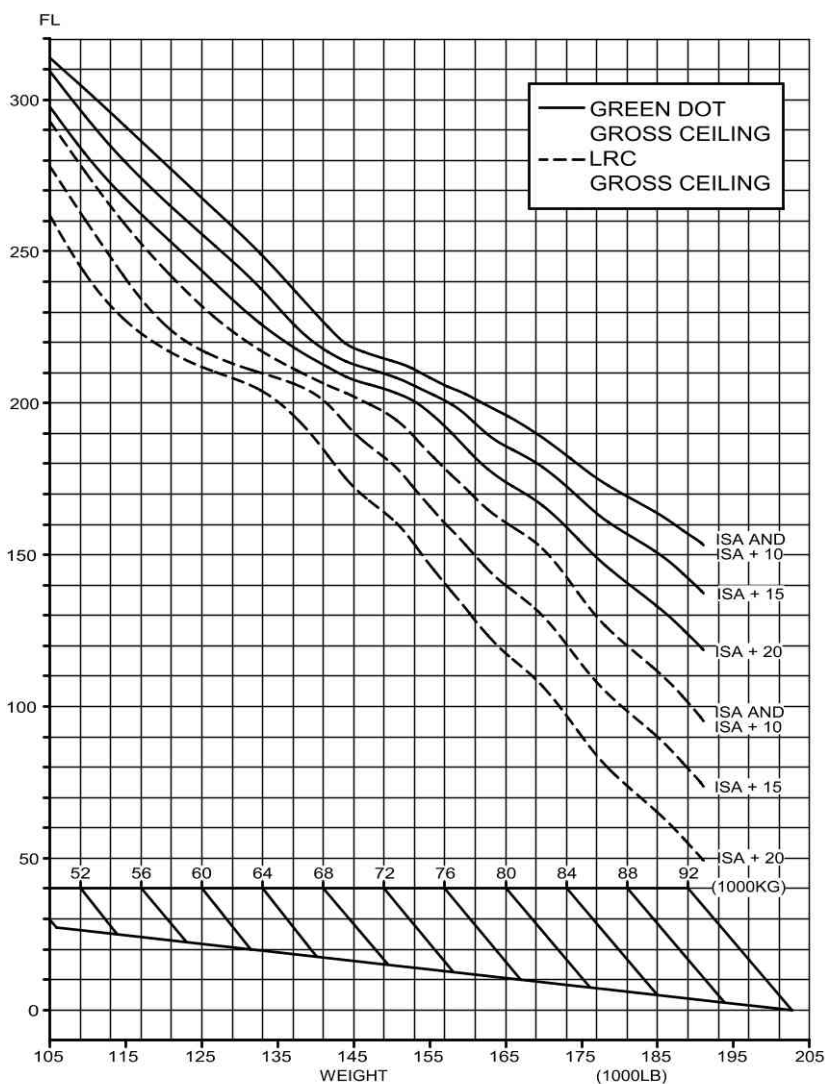
- Note:
- MAX MODE IS NOT RECOMMENDED AT LANDING
  - THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).



## CEILINGS

### ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA	ISA + 10	ISA + 15	ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-1 300 ft	-1 400 ft	-1 400 ft
	TOTAL ANTI ICE ON	-2 800 ft	-2 800 ft	-2 800 ft	-3 000 ft
GREEN DOT	ENGINE ANTI ICE ON	-1 000 ft	-1 000 ft	-1 100 ft	-1 200 ft
	TOTAL ANTI ICE ON	-2 100 ft	-2 100 ft	-2 300 ft	-2 500 ft

Note: For weights 85 000 kg or 187 400 lb, one engine ceilings at Long Range speed may be overestimated by FMS Legacy. In this case, ceiling values provided in the above graph should be retained.

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## GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

### ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		DISTANCE (NM) INITIAL SPEED (KT)		TIME (MIN) FUEL(1000KG) LEVEL OFF (FT)
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL						
	250	290	310	330	350	370	390
50				174 32 198 .9 31700	228 42 200 1.1 31800	262 47 202 1.3 31900	288 52 204 1.3 31900
54			156 29 202 .9 30100	222 41 204 1.2 30200	258 47 206 1.4 30300	285 52 208 1.5 30300	308 55 210 1.5 30400
58		152 29 206 .9 28200	231 43 208 1.3 28500	269 50 210 1.5 28600	298 54 212 1.7 28600	320 58 214 1.7 28700	339 61 216 1.8 28700
62		236 45 212 1.5 26400	279 52 214 1.7 26600	309 57 216 1.8 26600	333 61 218 1.9 26700	352 64 220 2.0 26700	369 67 222 2.1 26800
66	155 30 214 1.1 24200	281 53 218 1.8 24600	314 59 220 2.0 24600	339 63 222 2.1 24700	360 67 224 2.2 24700	378 69 226 2.3 24800	393 71 228 2.3 24800
70	231 45 220 1.7 22600	311 59 224 2.1 22800	335 63 226 2.2 22800	357 67 228 2.3 22900	376 70 230 2.4 22900	392 72 232 2.5 22900	406 74 234 2.5 23000
74	214 41 226 1.6 21300	278 53 230 2.0 21400	301 56 232 2.1 21400	321 60 234 2.2 21500	339 62 236 2.2 21500	354 65 238 2.3 21500	
78	212 40 232 1.6 20500	264 49 236 1.9 20600	283 52 238 2.0 20600	301 55 240 2.1 20600	316 57 242 2.2 20600	330 60 244 2.2 20600	
82	242 46 238 1.9 19600	282 52 242 2.1 19700	298 55 244 2.2 19700	313 57 246 2.3 19700	326 59 248 2.3 19800		
86	278 52 244 2.3 18400	317 58 248 2.5 18400	332 61 250 2.6 18500	346 63 252 2.6 18500	359 65 254 2.7 18500		
90	300 56 250 2.6 17100	335 61 254 2.7 17200	349 64 256 2.8 17200	363 66 258 2.9 17200			
94	317 59 256 2.8 15900	350 64 260 3.0 15900	363 66 262 3.0 16000	375 67 264 3.1 16000			
CORRECTIONS		DISTANCE		TIME	FUEL	LEVEL OFF	
ENGINE ANTI ICE ON		+ 15 %		+ 12 %	+ 18 %	- 200 FT	
TOTAL ANTI ICE ON		+ 20 %		+ 24 %	+ 33 %	- 700 FT	

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## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)		MACH IAS (KT)	
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
<b>50</b>	1.181 .442	1.250 .480	1.319 .507	1.369 .530	1.417 .549	1.472 .571	
	1972 244	1915 241	1856 236	1874 237	1870 236	1875 236	
<b>54</b>	1.199 .454	1.281 .494	1.363 .529	1.411 .548	1.464 .569	1.520 .588	
	2093 251	2047 249	2029 246	2028 246	2032 245	2034 243	
<b>58</b>	1.223 .466	1.310 .506	1.402 .546	1.454 .567	1.510 .587	1.554 .591	
	2224 258	2174 255	2185 255	2190 254	2196 253	2138 244	
<b>62</b>	1.253 .484	1.344 .521	1.441 .562	1.497 .583	1.536 .585	1.568 .551	
	2387 268	2330 263	2343 262	2354 262	2277 252	2121 227	
<b>66</b>	1.278 .495	1.380 .538	1.480 .578	1.534 .595	1.548 .548		
	2519 274	2499 272	2504 270	2503 267	2252 235		
<b>70</b>	1.303 .506	1.412 .552	1.517 .591	1.547 .578			
	2651 280	2651 278	2667 277	2519 260			
<b>74</b>	1.327 .515	1.446 .567	1.549 .600	1.562 .528			
	2785 286	2818 286	2811 281	2482 236			
<b>78</b>	1.359 .531	1.478 .579	1.557 .577				
	2968 295	2979 293	2795 270				
<b>82</b>	1.385 .543	1.510 .592	1.574 .523				
	3124 301	3146 299	2758 243				
<b>86</b>	1.412 .554	1.519 .580					
	3282 308	3163 293					
<b>90</b>	1.440 .567	1.529 .559					
	3449 315	3158 282					
<b>94</b>	1.456 .569	1.549 .512					
	3540 316	3139 258					
ENGINE ANTI ICE ON $\Delta$ FUEL = + 2 %				TOTAL ANTI ICE ON $\Delta$ FUEL = + 4 %			



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## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

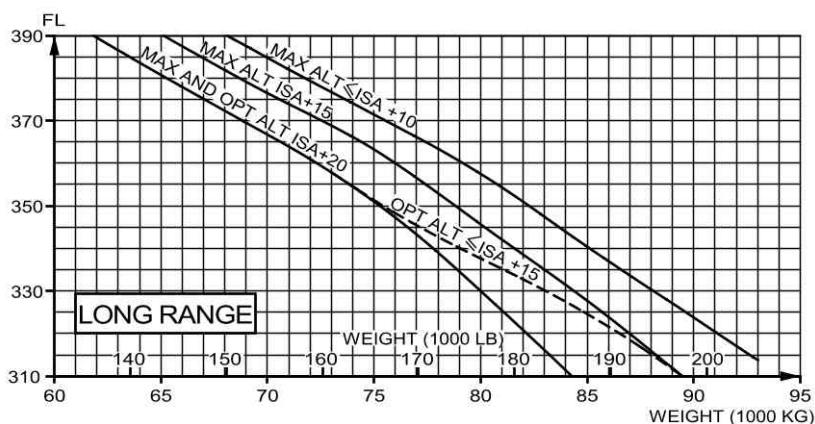
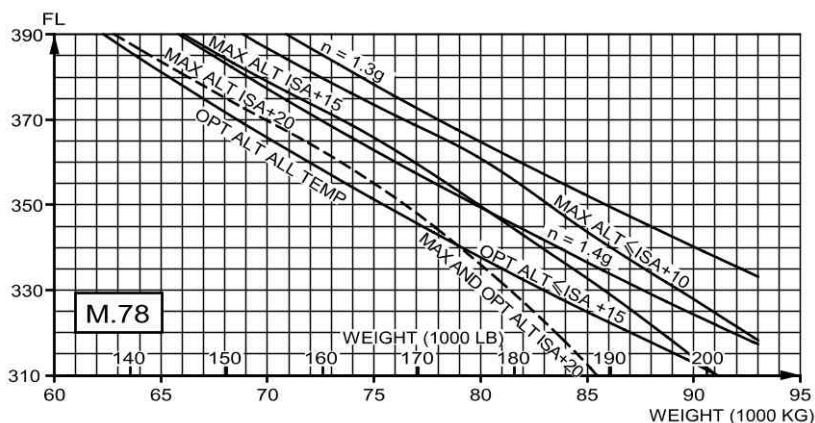
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
AIR DIST. (NM)		FLIGHT LEVEL					CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1510 0.46	1317 0.44	1180 0.42	1131 0.41	1083 0.41	1061 0.41	9	7	6
300	2259 1.06	2008 1.03	1826 0.59	1762 0.58	1699 0.57	1670 0.58	15	14	13
400	3004 1.27	2694 1.22	2468 1.17	2388 1.15	2312 1.14	2276 1.15	21	20	20
500	3745 1.47	3377 1.41	3106 1.34	3010 1.32	2921 1.31	2877 1.32	27	27	27
600	4481 2.08	4055 2.00	3739 1.52	3628 1.49	3527 1.48	3475 1.49	34	34	34
700	5212 2.28	4729 2.19	4369 2.10	4241 2.07	4129 2.04	4069 2.05	40	40	41
800	5938 2.49	5400 2.39	4994 2.28	4851 2.24	4727 2.21	4659 2.22	46	47	48
900	6659 3.10	6066 2.58	5615 2.46	5456 2.41	5320 2.38	5247 2.38	52	53	54
1000	7376 3.31	6728 3.17	6232 3.04	6058 2.59	5907 2.55	5831 2.55	58	60	61
1100	8088 3.52	7387 3.37	6845 3.22	6656 3.16	6490 3.12	6413 3.11	63	66	68
1200	8798 4.13	8042 3.56	7454 3.41	7250 3.34	7070 3.29	6991 3.28	69	73	74
1300	9506 4.34	8693 4.16	8059 3.59	7840 3.52	7645 3.46	7566 3.44	75	79	81
1400	10209 4.55	9340 4.36	8661 4.17	8427 4.10	8217 4.03	8137 4.00	81	86	87
ENGINE ANTI ICE ON △FUEL = + 2 %					TOTAL ANTI ICE ON △FUEL = + 4 %				

FLIP23 A321-131 IAE V2530-A5 3610 03301.001011 0250300 .7801 .000100 140 0300350 60 0 100100 40100 18590 CL-N0-04-07-150



## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 500 ft Opt ALT : - 300 ft	Max ALT : -1 100 ft Opt ALT : - 300 ft
ISA +15	Max ALT : - 700 ft Opt ALT : - 300 ft	Max ALT : -1 500 ft Opt ALT : - 600 ft
ISA +20	Max ALT : -1 000 ft Opt ALT : -1 000 ft	Max ALT : -2 300 ft Opt ALT : -2 300 ft

## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

**ALL ENGINES**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 – DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 65000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
						TIME (H.MIN)			
AIR	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
DIST.							FL290	FL330	FL370
(NM)	290	310	330	350	370	390	FL310	FL350	FL390
200	1037 0.36	978 0.36	926 0.36	880 0.36	842 0.36	816 0.36	1	2	4
400	2281 1.02	2158 1.02	2049 1.02	1956 1.03	1885 1.03	1854 1.03	7	10	20
600	3518 1.27	3329 1.28	3164 1.29	3023 1.29	2918 1.30	2875 1.30	13	18	33
800	4747 1.53	4494 1.54	4271 1.55	4081 1.56	3939 1.56	3882 1.56	19	25	45
1000	5970 2.19	5650 2.20	5370 2.22	5131 2.23	4951 2.23	4874 2.23	25	33	57
1200	7185 2.45	6799 2.47	6461 2.48	6171 2.49	5952 2.50	5852 2.50	31	40	67
1400	8393 3.11	7941 3.13	7544 3.14	7204 3.16	6944 3.17	6816 3.17	36	47	77
1600	9596 3.37	9076 3.39	8620 3.41	8228 3.43	7925 3.44	7768 3.44	41	54	86
1800	10792 4.03	10205 4.05	9689 4.07	9244 4.09	8898 4.10	8707 4.10	46	60	94
2000	11983 4.29	11327 4.31	10751 4.34	10254 4.36	9865 4.37	9640 4.37	51	66	102
2200	13167 4.55	12442 4.58	11806 5.00	11256 5.03	10825 5.04	10566 5.04	56	73	110
2400	14345 5.21	13551 5.24	12855 5.26	12251 5.29	11776 5.31	11482 5.31	61	79	117
2600	15518 5.47	14654 5.50	13897 5.53	13239 5.56	12720 5.58	12388 5.58	65	85	125
2800	16685 6.13	15750 6.16	14932 6.19	14220 6.23	13657 6.24	13286 6.24	68	90	131
3000	17851 6.39	16841 6.42	15961 6.46	15195 6.49	14586 6.51	14175 6.51	72	96	138
ECON AIR CONDITIONING △FUEL = - 0.6 %			ENGINE ANTI ICE ON △FUEL = + 2 %			TOTAL ANTI ICE ON △FUEL = + 5 %			

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CL-N0-CL-004-009-1E0

## COST INDEX FOR LONG RANGE CRUISE SPEED

**ALL ENGINES**

- For a quick determination of the  $CI_{LRC}$ , use:
- $CI_{LRC}$  = 50 kg/min in the FMGC.
  - or
  - $CI_{LRC}$  = 70 (100 lb/h) in the FMGC.



## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)	60				80				IAS (KT)
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.7	173	100	IDLE					241
370	15.9	166	95	IDLE	18.0	186	108	IDLE	252
350	15.2	159	90	IDLE	17.3	179	103	IDLE	264
330	14.6	153	85	IDLE	16.6	173	98	IDLE	277
310	14.0	148	81	IDLE	16.0	167	93	IDLE	289
290	13.5	143	76	IDLE	15.3	161	88	IDLE	300
270	12.8	137	71	IDLE	14.5	154	81	IDLE	300
250	12.1	131	66	IDLE	13.6	146	75	IDLE	300
240	11.7	127	63	IDLE	13.2	143	72	IDLE	300
220	11.0	121	58	IDLE	12.3	135	66	IDLE	300
200	10.2	114	53	IDLE	11.5	127	60	IDLE	300
180	9.5	108	48	IDLE	10.5	119	54	IDLE	300
160	8.7	100	43	IDLE	9.6	110	48	IDLE	300
140	7.9	93	39	IDLE	8.7	101	42	IDLE	300
120	7.1	85	34	IDLE	7.7	92	37	IDLE	300
100	6.3	76	29	IDLE	6.7	81	31	IDLE	300
50	2.4	30	10	IDLE	2.5	32	11	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		ECON AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		—		+ 1 min		+ 3 min		+ 0.2 %	
FUEL		— 2 %		+ 17 %		+ 90 %		+ 0.7 %	
DISTANCE		—		+ 4 %		+ 20 %		+ 0.4 %	

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## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 120 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 100 KG (4MIN)									
REF. LDG WT AT DEST. = 60000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	601 0.12						2		
60	775 0.16						4		
80	950 0.20	898 0.19					5		
100	1124 0.23	1056 0.23	1035 0.22				6	6	
120	1299 0.27	1213 0.26	1172 0.26	1172 0.25			7	7	
140	1474 0.31	1371 0.30	1310 0.29	1294 0.28			8	8	
160	1649 0.35	1529 0.33	1447 0.32	1416 0.31	1423 0.31		9	8	10
180	1825 0.39	1687 0.37	1585 0.35	1539 0.35	1536 0.34	1547 0.33	10	9	12
200	2000 0.43	1845 0.40	1723 0.38	1662 0.38	1650 0.36	1654 0.36	11	10	13
220	2176 0.46	2003 0.44	1860 0.42	1784 0.41	1763 0.39	1761 0.39	12	10	14
240	2352 0.50	2161 0.47	1998 0.45	1907 0.44	1877 0.42	1869 0.41	13	11	15
260	2529 0.54	2320 0.50	2136 0.48	2030 0.47	1991 0.45	1976 0.44	15	12	16
280	2705 0.58	2479 0.54	2274 0.51	2153 0.50	2105 0.48	2084 0.47	16	13	17
300	2882 1.02	2638 0.57	2413 0.54	2277 0.53	2220 0.51	2192 0.50	17	13	18
320	3059 1.05	2797 1.01	2551 0.58	2400 0.57	2334 0.54	2300 0.53	18	14	20
340	3236 1.09	2956 1.04	2689 1.01	2524 1.00	2449 0.57	2408 0.55	19	15	21
360	3414 1.13	3115 1.07	2828 1.04	2647 1.03	2563 1.00	2516 0.58	20	16	22
380	3591 1.17	3275 1.11	2966 1.07	2771 1.06	2678 1.03	2625 1.01	21	16	23
400	3769 1.21	3435 1.14	3105 1.10	2895 1.09	2793 1.06	2733 1.04	22	17	24
420	3947 1.24	3594 1.18	3243 1.14	3019 1.12	2908 1.09	2842 1.06	23	18	25
440	4125 1.28	3754 1.21	3382 1.17	3143 1.15	3023 1.12	2951 1.09	25	19	26
460	4304 1.32	3915 1.24	3521 1.20	3267 1.18	3138 1.15	3060 1.12	26	20	27
480	4482 1.35	4075 1.28	3660 1.23	3392 1.21	3253 1.18	3169 1.15	27	20	28
500	4661 1.39	4235 1.31	3799 1.26	3516 1.25	3369 1.21	3278 1.18	28	21	30
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 4 %			ΔFUEL = + 6 %			

CL-W0-04-13-155

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## IN CRUISE QUICK CHECK FL 100 LONG RANGE

### FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING CRUISE : LONG RANGE - DESCENT : 250KT IMC PROCEDURE : 140 KG (6MIN)								FL100
NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)							
	65	70	75	80	85	90	95	
40	337 0.15	339 0.15	342 0.15	347 0.15	353 0.15	361 0.15	370 0.15	
60	515 0.18	523 0.18	531 0.18	540 0.18	551 0.18	561 0.18	571 0.18	
80	693 0.22	706 0.22	719 0.21	733 0.21	748 0.21	761 0.21	773 0.21	
100	871 0.26	890 0.25	908 0.25	926 0.24	945 0.24	960 0.24	975 0.24	
120	1048 0.30	1073 0.29	1096 0.28	1119 0.28	1141 0.27	1160 0.27	1176 0.27	
140	1226 0.33	1256 0.32	1284 0.31	1312 0.31	1338 0.30	1359 0.30	1378 0.30	
160	1403 0.37	1438 0.36	1472 0.35	1504 0.34	1534 0.33	1559 0.33	1580 0.33	
180	1580 0.41	1621 0.39	1659 0.38	1696 0.37	1731 0.36	1758 0.36	1782 0.36	
200	1757 0.45	1803 0.43	1846 0.42	1888 0.41	1927 0.39	1957 0.39	1984 0.39	
220	1933 0.48	1985 0.46	2034 0.45	2080 0.44	2123 0.43	2156 0.42	2185 0.42	
240	2110 0.52	2167 0.50	2221 0.48	2271 0.47	2319 0.46	2355 0.45	2387 0.45	
260	2286 0.56	2349 0.53	2407 0.52	2463 0.51	2515 0.49	2554 0.48	2589 0.48	
280	2462 1.00	2530 0.57	2594 0.55	2654 0.54	2710 0.52	2753 0.51	2791 0.51	
300	2637 1.04	2711 1.00	2780 0.58	2845 0.57	2906 0.55	2952 0.54	2993 0.54	
320	2813 1.07	2892 1.04	2967 1.02	3036 1.00	3101 0.59	3150 0.57	3195 0.57	
340	2988 1.11	3073 1.07	3153 1.05	3227 1.04	3296 1.02	3349 1.00	3397 1.00	
360	3164 1.15	3254 1.11	3339 1.09	3417 1.07	3491 1.05	3547 1.03	3599 1.03	
380	3339 1.19	3434 1.15	3524 1.12	3608 1.10	3686 1.08	3745 1.05	3800 1.05	
400	3513 1.23	3615 1.18	3710 1.15	3798 1.14	3881 1.12	3943 1.08	4001 1.08	
420	3688 1.26	3795 1.22	3895 1.19	3988 1.17	4076 1.15	4141 1.11	4202 1.11	
440	3862 1.30	3975 1.25	4080 1.22	4177 1.20	4270 1.18	4339 1.14	4402 1.14	
460	4037 1.34	4154 1.29	4265 1.26	4367 1.24	4465 1.22	4537 1.17	4603 1.17	
480	4211 1.38	4334 1.33	4450 1.29	4557 1.27	4659 1.25	4735 1.20	4803 1.20	
500	4384 1.42	4513 1.36	4635 1.33	4746 1.30	4853 1.28	4932 1.23	5003 1.23	
520	4558 1.46	4692 1.40	4819 1.36	4935 1.34	5047 1.32	5130 1.26	5203 1.26	
540	4732 1.49	4871 1.43	5003 1.40	5124 1.37	5241 1.35	5327 1.29	5403 1.29	
AIR CONDITIONING OFF △FUEL = - 2 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 5 %			

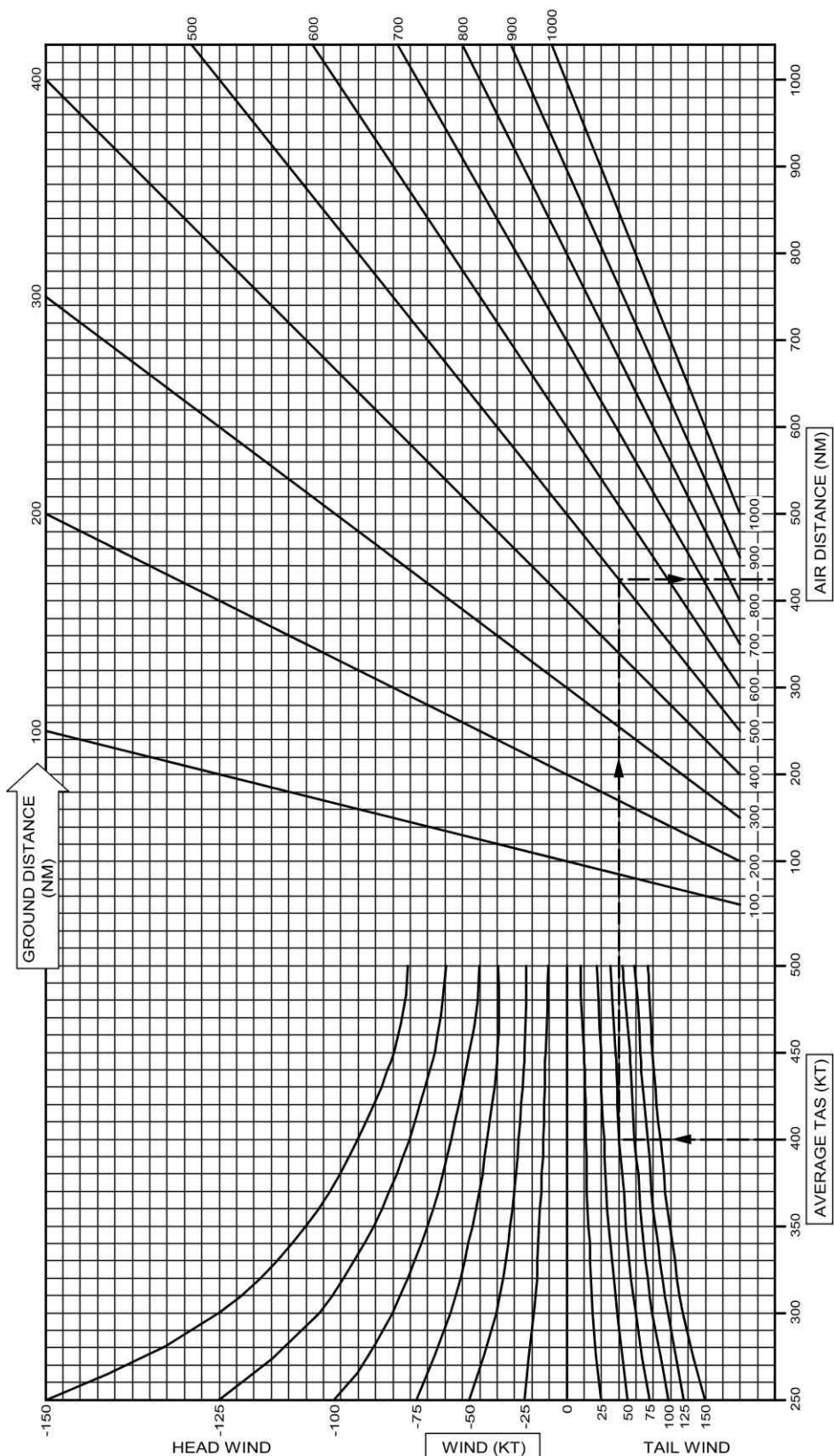
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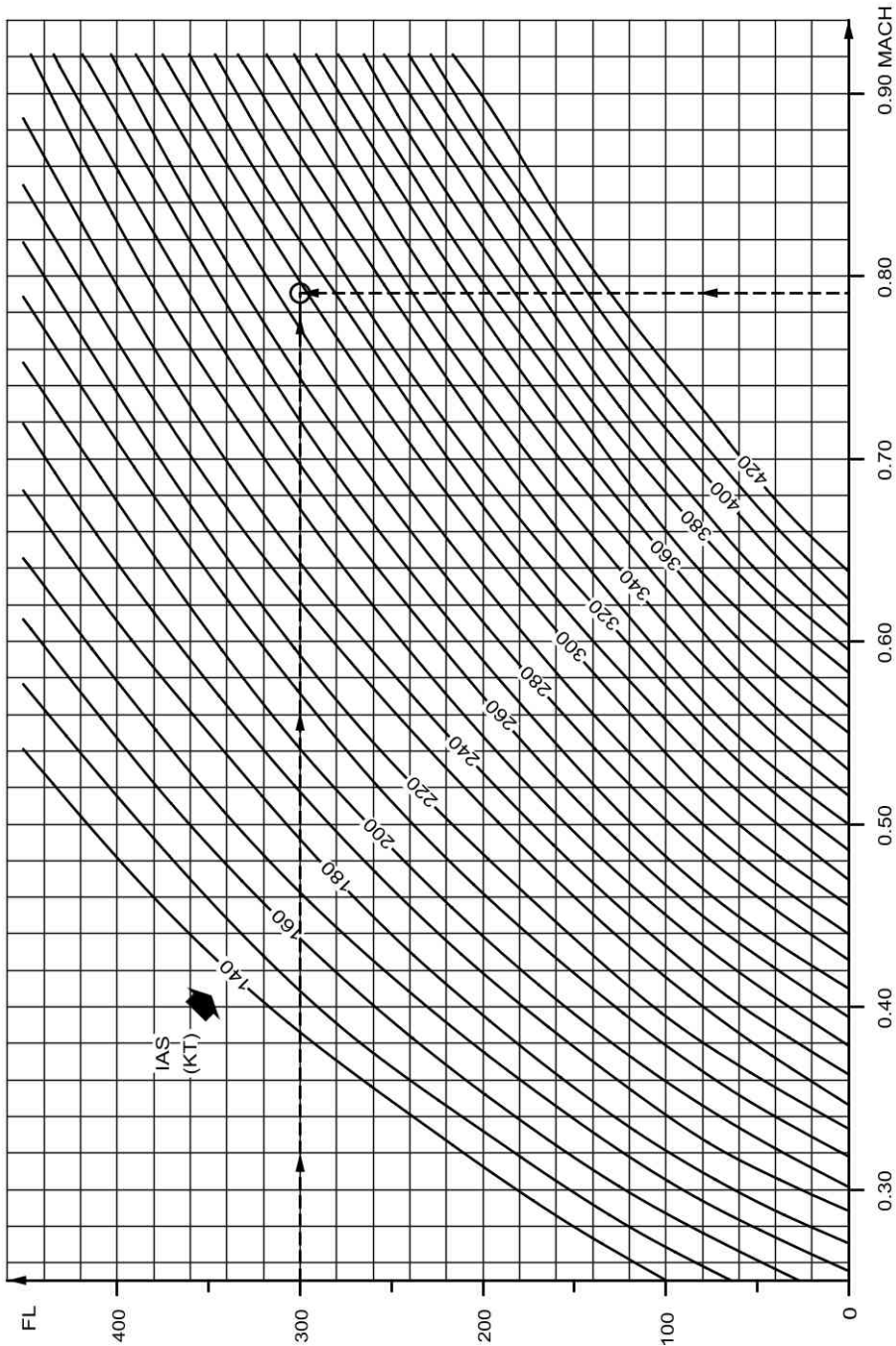




## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEL condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOD at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

FPF (HYD G SYS LO PR) = 10 %

FPF (INOP SYS: L AIL) = 8 %

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x (10 % + 8 %)

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore, ADDITIONAL FUEL = (FOB - EFOD at DEST) x 8 %

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.



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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**Flight Controls Architecture.....OPS.03**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

FL	SPD or Mach	GROSS WEIGHT (1000 kg)										
		54	58	62	66	70	74	78	82	86	90	94
		N1 %										
390	0.76	79.4	80.6	-	-	-	-	-	-	-	-	-
370	0.76	77.9	78.9	80.0	81.2	-	-	-	-	-	-	-
350	0.76	77.2	77.9	78.8	79.7	80.7	-	-	-	-	-	-
330	0.76	76.9	77.6	78.2	79.0	79.8	80.7	81.6	-	-	-	-
310	0.76	76.7	77.3	77.9	78.5	79.2	79.9	80.6	81.5	82.4	-	-
290	0.76	76.7	77.2	77.7	78.2	78.8	79.4	80.0	80.6	81.4	82.1	83.0
270	300	76.2	76.6	77.0	77.5	78.0	78.5	79.1	79.6	80.3	80.9	81.6
250	300	75.0	75.4	75.8	76.2	76.7	77.1	77.7	78.2	78.9	79.5	80.2
200	300	72.2	72.5	72.9	73.3	73.7	74.2	74.7	75.2	75.8	76.4	77.0
150	270	65.5	65.9	66.5	67.0	67.7	68.4	69.2	70.3	71.0	71.8	72.6
100	270	62.5	62.9	63.5	64.0	64.6	65.3	66.0	66.8	67.6	68.4	69.2
50	270	59.1	59.5	60.0	60.5	61.1	61.8	62.6	63.4	64.2	65.0	65.7

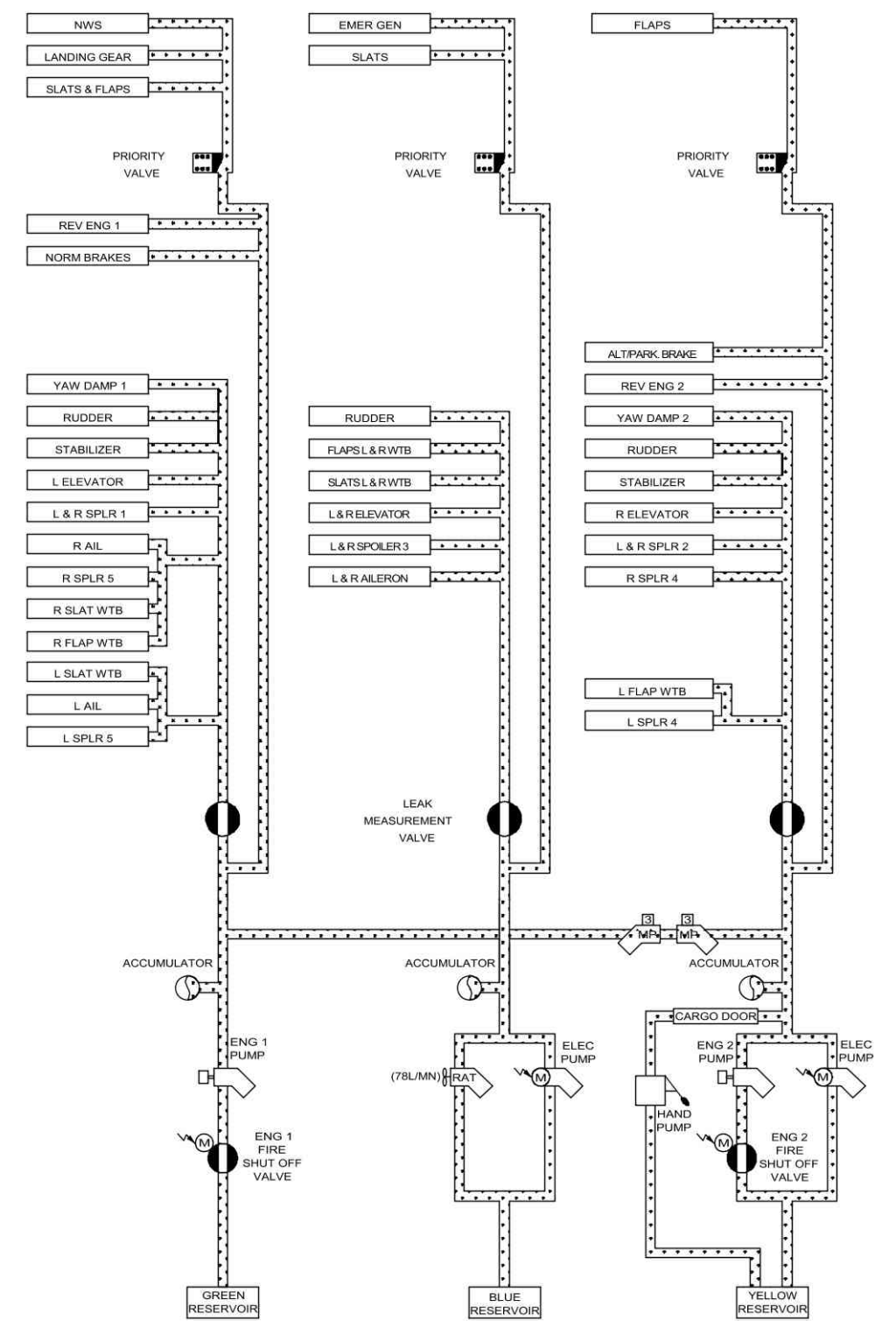
SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

● **FOR APPROACH:**

A/THR in managed speed.....USE

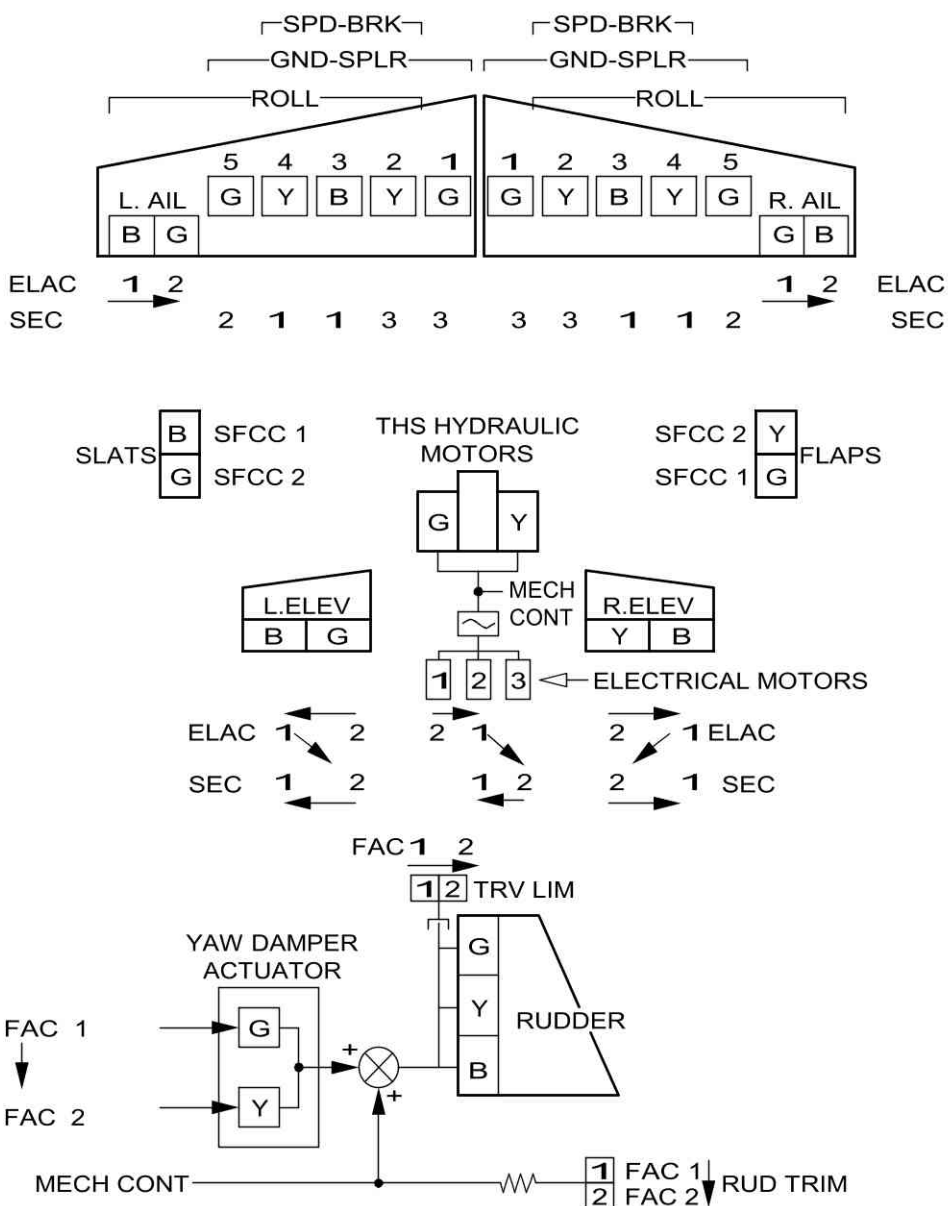
HYDRAULIC ARCHITECTURE







## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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## **OEBPROC-PLP PRELIMINARY PAGES**

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## **OEBPROC-11 "ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight**

<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.00</b>
----------------------------------------------------------------	--------------

<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.01</b>
----------------------------------------------------------------	--------------

## **OEBPROC-17 Dual FM Reset upon Radial Fix Info Entry**

<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.00</b>
------------------------------------------------------	--------------

<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.01</b>
------------------------------------------------------	--------------

## **OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.00</b>
--------------------------------------------------------------------------------	--------------

<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.01</b>
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## **OEBPROC-36 No SRS Engagement During Go Around in the Case of EPR Mode Fault**

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.00</b>
------------------------------------------------------------------------------	--------------

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.01</b>
------------------------------------------------------------------------------	--------------

## **OEBPROC-38 Erroneous Radio Altimeter Height Indication**

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.00</b>
---------------------------------------------------------	--------------

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.01</b>
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## **OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**

<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.00</b>
------------------------------------------------------------------------	--------------

<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.01</b>
------------------------------------------------------------------------	--------------

## **OEBPROC-43 F/CTL SPOILER FAULT**

<b>F/CTL SPOILER FAULT.....</b>	<b>43.00</b>
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<b>F/CTL SPOILER FAULT.....</b>	<b>43.01</b>
---------------------------------	--------------

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

L/G GEAR NOT DOWNLOCKED.....	44.00
■ L/G GEAR NOT DOWNLOCKED ■.....	44.01



## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an **ENG 1(2) OIL FILTER CLOG** ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTH					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTH					





## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### **ECAM ENTRY**

ENG 1(2) OIL FILTER CLOG

### **PROCEDURE**

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HTH				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HTH				



## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HTH				
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
	Criteria: SA Applicable to: B-HTH				





## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB36 Issue 1.0

# NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HTH					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HTH					



## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

RED OEB – RED OEB – RED OEB – RED OEB – RED OEB – RED OEB – RED OEB

M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTH				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTH				





## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	<b>BLANK</b>
		30 MAR 12

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		40.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTH				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTH				



## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



<b>AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT (Cont'd)</b>
--------------------------------------------------------------------------------

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
 PACK (affected bleed side).....OFF

X BLEED..... OPEN  
 BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
 BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).



## OEB43 Issue 2.0 F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		43.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTH				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTH				





## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above  $V_{FE_{NEXT}}$ , the flight crew should deselect A/THR, decelerate to  $V_{FE_{NEXT}}$ , and select CONF 1 when below  $V_{FE_{NEXT}}$ . When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD..... $V_{REF} + 10KT$

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers.....x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*



## OEB44 Issue 2.0

### L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTH				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTH				



## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	BLANK
		30 MAR 12

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## **QUICK REFERENCE HAND BOOK**

**A320/A321**



**DRAGONAIR**

**For A/C: B-HTI**

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	1/2
		30 MAR 12

**Issue date: 30 MAR 12**

This is the QUICK REFERENCE HAND BOOK at issue date 30 MAR 12 for the A320/A321 and replacing last issue dated 20 SEP 11

QRH PAGE GEN.03 PROVIDES ADDITIONAL GUIDANCE TO MANAGE THE QRH UPDATES.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	TRANSMITTAL LETTER	2/2
		30 MAR 12

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 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	1/2
		30 MAR 12

Please incorporate the revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date


No filing instructions

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	FILING INSTRUCTIONS	2/2
		30 MAR 12

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# **PRELIMINARY PAGES**

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE OPERATIONS</b> <b>ENGINEERING BULLETIN</b>	1/2
		30 MAR 12

M <sup>(1)</sup>	Identification	T <sup>(2)</sup>	E <sup>(3)</sup>	Rev. Date	Title
	OEB38 issue 1.0	R	N	30 MAR 12	Erroneous Radio Altimeter Height Indication
	Criteria: SA <b>Applicable to: B-HTI</b>				
	OEB11 issue 1.0	W	Y	30 MAR 12	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight
	Criteria: V2500-A5 <b>Applicable to: B-HTI</b>				
	OEB17 issue 1.0	W	N	30 MAR 12	Dual FM Reset upon Radial Fix Info Entry
	Criteria: 22-1090, P7520 <b>Applicable to: B-HTI</b>				
	OEB31 issue 1.0	W	N	30 MAR 12	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches
	Criteria: SA <b>Applicable to: B-HTI</b>				
	OEB36 issue 1.0	W	Y	30 MAR 12	No SRS Engagement During Go Around in the Case of EPR Mode Fault
	Criteria: 22-1203, IAE, P8015, P8486, P9126 <b>Applicable to: B-HTI</b>				
	OEB40 issue 1.0	W	Y	30 MAR 12	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT
	Criteria: SA <b>Applicable to: B-HTI</b>				
	OEB43 issue 2.0	W	Y	20 SEP 11	F/CTL SPOILER FAULT
	Criteria: SA <b>Applicable to: B-HTI</b>				
	OEB44 issue 2.0	W	Y	30 MAR 12	L/G GEAR NOT DOWNLOCKED
	Criteria: SA <b>Applicable to: B-HTI</b>				

(1) Evolution code : N=New, R=Revised, E=Effectivity

(2) Type of OEB: R=Red, W=White

(3) Affects ECAM: Y=Yes, N=No

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE OPERATIONS ENGINEERING BULLETIN</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE</b> <b>SECTIONS/SUBSECTIONS</b>	<b>1/2</b>
		30 MAR 12

<b>M<sup>(1)</sup></b>	<b>Localization</b>	<b>Subsection Title</b>	<b>Rev. Date</b>
	GEN	General	30 MAR 12
	ABN-21	Air Conditioning/Ventilation/Pressurization	30 MAR 12
	ABN-22	Auto Flight	30 MAR 12
	ABN-24	Electrical	30 MAR 12
	ABN-25	Equipment	30 MAR 12
	ABN-26	Fire Protection	30 MAR 12
	ABN-27	Flight Controls	30 MAR 12
	ABN-28	Fuel	30 MAR 12
	ABN-29	Hydraulic	30 MAR 12
	ABN-30	Ice and Rain Protection	30 MAR 12
	ABN-31	Indicating / Recording Systems	30 MAR 12
	ABN-32	Landing Gear	30 MAR 12
	ABN-34	Navigation	30 MAR 12
	ABN-36	Pneumatic	30 MAR 12
	ABN-70	Engines	30 MAR 12
	ABN-80	Miscellaneous	30 MAR 12
	CP-LVO	Low Visibility Operations	30 MAR 12
	CP-LVP	Low Visibility Procedures	30 MAR 12
	CP-RNAV	Area Navigation	30 MAR 12
	CP-AWO	Cold Weather / De-Icing	30 MAR 12
	CP-AWP	All Weather Procedures	30 MAR 12
	CP-AWA	All Weather Altimetry	30 MAR 12
	CP-MISC	Miscellaneous	30 MAR 12
	CP-FAIL	ACARS LANDING Fail Codes	30 MAR 12
	FPE-SPD	Speeds	30 MAR 12
	FPE-IFL	In-Flight Landing	30 MAR 12
	FPE-OEI	One Engine Inoperative	30 MAR 12
	FPE-AEO	All Engines Operative	30 MAR 12
	FPE-CAB	Flight Without Cabin Pressurization	30 MAR 12
	FPE-OPD	Operating Data	30 MAR 12
	FPE-FPF	Fuel Penalty Factors	30 MAR 12
	OPS	Operational Data	30 MAR 12
	OEBPROC-11	"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	30 MAR 12
	OEBPROC-17	Dual FM Reset upon Radial Fix Info Entry	30 MAR 12
	OEBPROC-31	Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	30 MAR 12
	OEBPROC-36	No SRS Engagement During Go Around in the Case of EPR Mode Fault	30 MAR 12
	OEBPROC-38	Erroneous Radio Altimeter Height Indication	30 MAR 12
	OEBPROC-40	AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	30 MAR 12
	OEBPROC-43	F/CTL SPOILER FAULT	30 MAR 12
	OEBPROC-44	L/G GEAR NOT DOWNLOCKED	30 MAR 12

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved


 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE SECTIONS/SUBSECTIONS</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES</b> <b>LIST OF EFFECTIVE TEMPORARY</b> <b>DOCUMENTARY UNITS</b>	<b>1/2</b>
		30 MAR 12

M <sup>(1)</sup>	Localization	DU Title	DU identification	DU date
	ABN-80	Computer Reset Table	NG00824	
	ABN-80	Computer Reset Table - 27 - Flight Controls	00014190.0001001	30 MAR 12
	Criteria: SA <b>Applicable to: B-HTI</b> <i>Impacted DU: 00010913 Computer Reset Table - 27 - Flight Controls</i> <u>Reason for issue:</u> <i>This Temporary Documentary Unit is created to allow flight crew to reset all SECs following a F/CTL SPLR FAULT triggered after the flight control check. This SEC reset covers the AIRBUS recommendations provided in OIT/FOT n° 999.0038/11.</i>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS</b>	<b>2/2</b>
		30 MAR 12


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This table gives, for each delivered aircraft, the cross reference between:


- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M <sup>(1)</sup>	MSN	FSN	Registration Number	Model
	2021	HDA 0152	B-HTI	321-231


(1) Evolution code : N=New, R=Revised

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>PRELIMINARY PAGES AIRCRAFT ALLOCATION TABLE</b>	<b>2/2</b>
		30 MAR 12

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 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>	<b>PRELIMINARY PAGES</b> <b>LIST OF MODIFICATIONS</b>	<b>1/6</b>
		30 MAR 12

M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P2590		30 AUG 10	NAVIGATION - INSTALL A BENDIX TCAS II COLLISION AVOIDANCE SYSTEM
	<b>Applicable to: ALL</b>			
	K10494		30 AUG 10	AIRBORNE AUXILIARY POWER - GENERAL - INSTALL APIC APS3200 APU AS STANDARD (REPLACES HONEYWELL GTCP36-300)
	<b>Applicable to: ALL</b>			
	P10383		30 AUG 10	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	<b>Applicable to: ALL</b>			
	31-1300 02		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	<b>Applicable to: ALL</b>			
	32-1336 01		25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD 10 BY SB ONLY.
	<b>Applicable to: ALL</b>			
	K2113		30 AUG 10	FUSELAGE - REAR FUSELAGE SECTION 16A - DEFINE A321 BASIC STRUCTURE
	<b>Applicable to: ALL</b>			
	P6251		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAINPROTECTION-INTRODUCE MODIFIED GAGE ASSYWITH INPUT VALUE FUNCTION SUPPRESSED
	<b>Applicable to: ALL</b>			
	P4801		30 AUG 10	ELECTRICAL POWER-GENERAL-DEFINE NEW ELECTRICAL GENERATION CONCEPT FOR SINGLE AISLE A/C
	<b>Applicable to: ALL</b>			
	K1806		30 AUG 10	ELECTRICAL POWER-AC/DC ESSENTIAL POWER DISTRIBUTION-PROVIDE PROVISIONS FOR EROPS-
	<b>Applicable to: ALL</b>			
	P7175		30 AUG 10	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	<b>Applicable to: ALL</b>			
	J1334		30 AUG 10	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF STANDARD UNIT P/N A4C
	<b>Applicable to: ALL</b>			
	P8564	31-1331 01	30 AUG 10	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE ENGINE AVAIL DISPLAY
	<b>Applicable to: ALL</b>			
	P1573		30 AUG 10	ENGINE CONTROLS-MODIFY POWER SUPPLY FOR HP FUEL SOLENOID
	<b>Applicable to: ALL</b>			
	K5213		30 AUG 10	AIR CONDITIONING-PACK TEMPERATURE CTRL-INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	<b>Applicable to: ALL</b>			
	J2662		30 AUG 10	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC -P/N SIC5059 14-20
	<b>Applicable to: ALL</b>			
	P5071	30-1037 02	30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD RAIN PROTECTION-ACTIVATION OF RAIN REPELLENTSYS.(FLUID COMPATIBLE WITH OZONE RULES)
	<b>Applicable to: ALL</b>			
	J0071		30 AUG 10	WINGS-WING TIP FENCES-INTRODUCE WING TIPS INCLUDING FENCES-
	<b>Applicable to: ALL</b>			
	K2450		30 AUG 10	AIRBORNE AUXILIARY POWER UNIT - INTRODUCE APIC APS-3200
	<b>Applicable to: ALL</b>			
	P7188	34-1345 02	30 AUG 10	NAVIGATION - EGPWS - ACTIVATE OBSTACLE OPTION ON THE EGPWS
	<b>Applicable to: ALL</b>			
	P9171		30 AUG 10	NAVIGATION-AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE AIR DATA MONITORING FUNCTION
	<b>Applicable to: ALL</b>			
	P4766		25 NOV 11	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	<b>Applicable to: ALL</b>			

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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	P6044		30 AUG 10	ICE AND RAIN PROTECTION-WINSHIELD- RAIN PROTECTION-INTRODUCE MODIFIED GAGE ASSY -P/N 4020W35-2
	Applicable to: ALL			
	P3112		25 NOV 11	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
	Applicable to: ALL			
	P0091		30 AUG 10	OXYGEN - FLIGHT CREW SYSTEM - INSTALL A 77.1 CU/FT BOTTLE IN COMPOSITE MATERIAL -
	Applicable to: ALL			
	P5895	34-1193 37	30 AUG 10	NAVIGATION-GPWS-INTRODUCE EGPWS P/N 206-206 AND INHIBIT AUTOMATIC DEACTIVATION ENHANCED FUNCTIONS
	Applicable to: ALL			
	K7755	25-1305 06	07 APR 11	EQUIPMENT FURNISHINGS-CURTAINS AND PARTITIONS-MODIFIED INTRUSION AND PENETRATION RESISTANT COCKPIT DOOR
	Applicable to: ALL			
	P2316		30 AUG 10	AUTO-FLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	31-1267 03		07 APR 11	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	Applicable to: ALL			
	P5613		25 NOV 11	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
	Applicable to: ALL			
	K4457		25 NOV 11	A.P.U.-POWER PLANT-INTRODUCE ALLIED SIGNAL APU 131-9(A)
	Applicable to: ALL			
	P4576		30 AUG 10	LANDING GEAR-ALTERNATE BRAKING- INTRODUCE MODIFIED ALTERNATE BRAKING SYSTEM
	Applicable to: ALL			
	P5768		30 AUG 10	ELEC PWR-AC EMERGENCY GENERATION- ACTIVATE A319/A321 ELECTRICAL EMERGENCY CONFIGURATION ON A320 A/C
	Applicable to: ALL			
	J0006		30 AUG 10	FUEL- INSTALL A CENTRE TANK SYSTEM-
	Applicable to: ALL			
	P9892		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMS2 THALES S4 (REV2+)- STD ON IAE AND PW A/C ASSOCIATED WITH FG I10
	Applicable to: ALL			
	P4234		30 AUG 10	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION-DESACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	P6952	34-1245 03	30 AUG 10	NAVIGATION-ADIRS-INSTALL LITTON ADIRU 4 MCU STANDARD 0314 (A318 COEFF CFM ADDED)
	Applicable to: ALL			
	P7520	22-1090 11	30 AUG 10	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P8256		25 NOV 11	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617FOR A318
	Applicable to: ALL			
	P6954		25 NOV 11	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE"BAM0616"
	Applicable to: ALL			
	P4642	34-1176 05	30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
	Applicable to: ALL			
	P4647		30 AUG 10	NAVIGATION - WEATHER RADAR SYSTEM - ACTIVATE COLLINS DUAL PREDICTIVE WINDSHEAR SYSTEM
	Applicable to: ALL			
	P5168	34-1162 08	30 AUG 10	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	Applicable to: ALL			
	P9824	31-1276 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)-INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	Applicable to: ALL			




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	P1872		30 AUG 10	AIR CONDITIONING - INSTALL CIRCUIT BREAKER FOR REAR CARGO COMPT VALVES FOR EROPS -
	<b>Applicable to: ALL</b>			
	K10009		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL IMPROVED STRIKES FOR COCKPIT DOOR
	<b>Applicable to: ALL</b>			
	P7125		30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1
	<b>Applicable to: ALL</b>			
	P8671	31A1220 01	07 APR 11	INDICATING/RECORDING SYSTEMS-ELECTRONICINSTRUMENT SYSTEM(EIS)- INSTALL DISPLAYMANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
	<b>Applicable to: ALL</b>			
	J2527		30 AUG 10	FUEL - QUANTITY INDICATING - INSTALL FUEL QUANTITY INDICATING COMPUTER STANDARD 13.10
	<b>Applicable to: ALL</b>			
	P4089		30 AUG 10	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE
	<b>Applicable to: ALL</b>			
	K9234		25 NOV 11	EQUIPMENT/FURNISHINGS-MISC. EMERGENCY EQUIPMENT-INSTALL ELT (406AF) WITH RCP IN COCKPIT ON ENH. PROV. - ELTA
	<b>Applicable to: ALL</b>			
	P4502	46-1001 08 46-1006 04	30 AUG 10	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	<b>Applicable to: ALL</b>			
	P6777		07 APR 11	INFORMATION SYSTEM-ATIMS- UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	<b>Applicable to: ALL</b>			
	J2361		30 AUG 10	FUEL-QUANTITY INDICATION-REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-9 (ANTI-MOD FOR MOD 32650)
	<b>Applicable to: ALL</b>			
	J2360		30 AUG 10	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION
	<b>Applicable to: ALL</b>			
	P6578		30 AUG 10	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
	<b>Applicable to: ALL</b>			
	P5638		30 AUG 10	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	<b>Applicable to: ALL</b>			
	25-1444 02		30 AUG 10	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	<b>Applicable to: ALL</b>			
	P7278		30 AUG 10	INDICATING/RECORDING SYSTEM-EIS2- INSTALL MODIFIED EIS2 SOFTWARE
	<b>Applicable to: ALL</b>			
	P8015		25 NOV 11	AUTO FLIGHT - FMGC - RE-INSTALL FMGC IAE P/N C13042BA01
	<b>Applicable to: ALL</b>			
	P0160		25 NOV 11	OXYGEN - FLIGHT CREW OXYGEN - INSTALL A 115 CU/FT STEEL OXYGEN CYLINDER -
	<b>Applicable to: ALL</b>			
	P3341		30 AUG 10	LANDING GEAR - WHEELS AND BRAKES - INSTALLATION OF MESSIER GOODRICH WHEELS AND BRAKES ON A321
	<b>Applicable to: ALL</b>			
	K9009	25-1239 01	07 APR 11	COMMUNICATIONS - P/A - MODIFY EMERGENCY POWER SUPPLY -
	<b>Applicable to: ALL</b>			
	J2153		30 AUG 10	FUEL-CERTIFICATION OF FUEL SYSTEM- (LOW PRESSURE SYSTEM) FOR THE OPERATION 0 TO 2 ACTS
	<b>Applicable to: ALL</b>			


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M <sup>(1)</sup>	MODIFICATION	Linked SB	Incorp. Date	Title
	K10463		07 APR 11	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INSTALL AIR CONDITIONING CONTROLLER P/N 1803B0000-02
	<b>Applicable to: ALL</b>			
	P9126	22-1203 01	07 APR 11	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1110 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS
	<b>Applicable to: ALL</b>			
	P3686		30 AUG 10	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510
	<b>Applicable to: ALL</b>			
	P4319	22-1058 47	30 AUG 10	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND
	<b>Applicable to: ALL</b>			
	K10516		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
	<b>Applicable to: ALL</b>			
	K8400		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE ENHANCED CIDS (A318 VERSION) AND RELATED SYSTEMSON SINGLE AISLE FAMILY
	<b>Applicable to: ALL</b>			
	P3511		30 AUG 10	AUTO FLIGHT - FAC - INSTALL TWO FACS P/N BAM 0509
	<b>Applicable to: ALL</b>			
	P8799	34-1352 01	30 AUG 10	NAVIGATION- GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	<b>Applicable to: ALL</b>			
	P8303		30 AUG 10	NAVIGATION - DDRMI - REMOVE DDRMI VOR/ADF/DME INDICATORS
	<b>Applicable to: ALL</b>			
	K7790		30 AUG 10	DOORS-PASSENGER COMPARTMENT FIXED INTERIOR DOORS-INSTALL ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	<b>Applicable to: ALL</b>			
	P10763		25 NOV 11	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2111 (RELEASE 1A) ON IAE AND PW A/C
	<b>Applicable to: ALL</b>			
	K0070		30 AUG 10	AIR CONDITIONING - CARGO COMPARTMENT - VENTILATION - INSTALL SYSTEM IN AFT COMPARTMENT -
	<b>Applicable to: ALL</b>			
	K0064		30 AUG 10	LIGHTS - EXTERIOR LIGHTS - INSTALL SYNCHRONIZED STROBE LIGHTS
	<b>Applicable to: ALL</b>			
	P3878		25 NOV 11	FLIGHT CONTROLS-INTRODUCE ELAC STD L69J
	<b>Applicable to: ALL</b>			
	P7372		25 NOV 11	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	J1617		30 AUG 10	FLIGHT CONTROLS-GENERAL- DELETION OF L.A.F. FEATURE FROM A320 A/C (SERIAL SOLUTION)
	<b>Applicable to: ALL</b>			
	P5706	31-1257 01	30 AUG 10	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2/E3P
	<b>Applicable to: ALL</b>			
	P8486		25 NOV 11	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S219) THALES(EQUIPPED WITH FMS2 THALES/SMITH)
	<b>Applicable to: ALL</b>			
	P9522		30 AUG 10	AUTO-FLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT(MCDU) - ACTIVATE BACK-UP NAV FUNCTION
	<b>Applicable to: ALL</b>			
	P4885	34-1197 13	30 AUG 10	NAVIGATION - GPWS - ACTIVATE ENHANCED FUNCTIONS OF THE EGPWS
	<b>Applicable to: ALL</b>			
	P7455		30 AUG 10	ELECTRICAL POWER-GENERAL-CHANGE IFE POWER SUPPLY BUSBARS INTO SHEDDABLE BUSBARS 220XP AND 212PP
	<b>Applicable to: ALL</b>			

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	P5253		30 AUG 10	NAVIGATION - ADIRS - REPLACE ADIRS CDU BY MSU (MODE SELECTOR UNIT)
	<b>Applicable to: ALL</b>			
	K7727		30 AUG 10	EQUIPMENT/FURNISHINGS - MISCELLANEOUS EMERGENCY EQPT - INSTALL AN HONEYWELL ELT WITH CONTROL PANEL IN COCKPIT
	<b>Applicable to: ALL</b>			
	K6156	21-1118 00	30 AUG 10	AIR CONDITIONING-PACK TEMP.CTRL INTRODUCE MODIFIED PACK TEMP. CTRL P/N 759D0000-02
	<b>Applicable to: ALL</b>			
	P1970		30 AUG 10	COMMUNICATIONS - INSTALL HF1 FOR EROPS
	<b>Applicable to: ALL</b>			
	P4983		25 NOV 11	AUTO-FLIGHT-FAC INTRODUCE FAC STD BAM 0513
	<b>Applicable to: ALL</b>			
	P4539		30 AUG 10	AUTOFLIGHT-FLIGHT CONTROL UNIT- (FCU) INTRODUCE SEXTANT MODULAR FCU
	<b>Applicable to: ALL</b>			
	K12825		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS DIRECTOR P/N -333B
	<b>Applicable to: ALL</b>			
	K12824		25 NOV 11	COMMUNICATIONS - CIDS - INSTALL CIDS AND SDF OBRM SOFTWARE P/N -33A AND CAM UPDATE
	<b>Applicable to: ALL</b>			
	P4121		30 AUG 10	EXHAUST-THRUST REVERSER CONTROL AND INDICATING ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
	<b>Applicable to: ALL</b>			
	K3901		30 AUG 10	COMMUNICATIONS-CIDS-INTRODUCE MODIFIED DIRECTOR POWER SUPPLY PRINCIPLE
	<b>Applicable to: ALL</b>			
	P5451		30 AUG 10	ELECTRICAL POWER - GENERAL - AC-DC MAIN DISTRIBUTION - INSTALL AC-DC SHEDDABLE BUSBARS
	<b>Applicable to: ALL</b>			
	P5669	34-1177 17	30 AUG 10	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0)
	<b>Applicable to: ALL</b>			
	P8710		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTI-SCAN FUNCTION
	<b>Applicable to: ALL</b>			
	P6703	22-1102 02 22-1226 02	30 AUG 10	AUTO-FLIGHT-FLIGHT AUGMENTATION COMPUTER-INTRODUCE FAC SOFTWARE STANDARD P/N B397BAM0515
	<b>Applicable to: ALL</b>			
	K3867		30 AUG 10	HYDRAULIC POWER-AUXILIARY HYDRAULIC POWER-RAT-INTRODUCE MODIFIED RAT (NEW BEARING)
	<b>Applicable to: ALL</b>			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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IMPORTANT

**SCOPE**

The QRH contains some specific procedures which are not displayed on the ECAM.  
As a general rule, procedures displayed on the ECAM are not provided in the QRH (Refer to FCOM PRO/ABN).

**TASK SHARING FOR ABN/EMER PROC**

The principles and guidelines described under TASK SHARING AND RESPONSIBILITIES in FCOM PRO/NOR/SOP remain applicable during emergency and abnormal procedures with the following additions:

**PF - Pilot Flying** - Responsible for:

- Thrust levers (for flight path and airspeed control)
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications
- Monitoring of all actions associated with ECAM or paper checklists

**PM - Pilot Monitoring** - Responsible for:

- Monitoring and reading aloud the ECAM and checklists
- Performing required action or actions requested by the PF, if applicable

*Note: Under no circumstances shall the PM manipulate thrust lever, engine master switch, fire switch, IR/ADR, or any guarded switch or pushbutton without confirmation by the PF.*

**Memory Items**

When emergency/abnormal procedures are actioned from memory, the required actions are performed, as appropriate, by the PF and PM.

When all memory actions are complete and the aircraft is stabilised on the correct flight path, the:

- **PF** shall confirm that the associated actions have been completed correctly.
- **PM** shall ensure that all the required memory actions have been carried out by reference to ECAM or checklist, and then complete the remainder of the procedure.

**ECAM CLEAR**


DO NOT CLEAR ECAM WITHOUT CROSS-CONFIRMATION OF BOTH PILOTS.

**ABN/EMER PROC INITIATION**

Procedures are initiated on pilot flying command.

No action will be taken (apart from audio warning cancel through MASTER WARN light) until:

- The appropriate flight path is established and,
- The aircraft is at least 400 ft above the runway, if a failure occurs during takeoff, approach, or go around.

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## USE OF SUMMARIES

### GENERAL

In case of an electrical emergency configuration, or a dual hydraulic failure:

**The ECAM should be applied first.**

This includes both the procedure, and the STATUS section.

Only after announcing "ECAM ACTIONS COMPLETED", should the Pilot Monitoring (PM) refer to the corresponding QRH summary.

When a failure occurs, and after performing the ECAM actions, the PM must refer to the bottom of the applicable Summary page (below the Go-Around section), in order to determine the landing distance that takes into account the failure.

For dry and wet runways, the Actual Landing Distances with failure are provided in the SUMMARIES.

These Actual Landing Distances with failure are based on the following assumptions:

- The approach speed is  $V_{REF} + \Delta V_{REF}$ . The speed increment "APPR COR" (when applicable), and the corresponding landing distance penalty that is required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, are not taken into account.
- These distances are computed without the benefit of the reverse thrust (i.e. using the LDG DIST Factors "WITHOUT REV").

If the flight crew wants to take into account the benefit of the reverse thrust at landing, the Actual Landing Distance with failure must be computed by multiplying the two following parameters:

- The LDG DIST Factor "WITH REV" (*Refer to the LDG CONF/APPR SPD/LDG DIST Tables*), and
- The Actual Landing Distance without failure (*Refer to the Landing Distance table without Autobrake (CONF FULL)*).

For contaminated runways, the LDG DIST Factors provided in the SUMMARIES are the LDG DIST Factors "WITHOUT REV".

Depending on the actual landing distance with failure, the PM can decide whether or not a diversion is necessary.

### APPROACH PREPARATION

As always, approach preparation includes a review of the ECAM STATUS.

After reviewing the STATUS, the PM should refer to the "CRUISE" section of the summary, to determine the VREF correction, and **compute the VAPP**.

A VREF table is provided in the summary.

The LANDING and GO-AROUND sections of the summary should be used for the **approach briefing**.

### APPROACH

The APPR PROC actions should be performed by reading the APPROACH section of the summary.

**The PM should then review the ECAM STATUS**, and check that all the APPR PROC actions have been completed.

## GENERAL INFORMATION

### **EFFECTIVITY**

As QRH is published at aircraft level, each paper page has only one effectivity.

### **PAGE NUMBERING**


The page numbering follows the following rules:

- |                 |   |                                                                                                                                 |
|-----------------|---|---------------------------------------------------------------------------------------------------------------------------------|
| 00, 01, 02, ... | : | Numbering for ABN, GEN, OPS, OEB PROC sections                                                                                  |
| 01A, 03B, ...   | : | Numbering and index (A, B, ...) for procedures written on several paper pages                                                   |
| 1/10, 3/5, ...  | : | Numbering for NP-NP, FPE-SPO                                                                                                    |
| C1, C2          | : | Index of the back cover page interior                                                                                           |
| C3              | : | Index of the back cover page exterior                                                                                           |
| "BLANK"         | : | Index of an intentionally left blank paper page created to ensure the correct format of the next chapter (begins on recto page) |

### **PRELIMINARY PAGES WITHIN THE QRH BINDER**

It is essential for Airlines to correctly manage the updates of the QRH. For this purpose, Airbus publishes Preliminary Pages with each QRH revision. These Preliminary Pages are used as reference documents for Airlines to manage the QRH updates, e.g. easily insert the revisions, identify the modifications that impact the QRH, get a synthesis of changes introduced with each revision. However, when the QRH revisions have been incorporated in accordance with the information given in the Preliminary Pages, these pages do not bring operational added value and therefore are no longer useful in the QRH binder for any operational purposes. Therefore, to minimize the size of the QRH binder on board the aircraft and to optimize the operational use of the QRH, Airbus has no objection that the Airlines remove the Preliminary Pages from the QRH after the revisions have been incorporated in the QRH and all checks performed to confirm the revisions have been correctly incorporated. You will find below the list of Preliminary Pages that may be removed from the QRH binder :

- The Transmittal Letter
- The Filing Instructions
- The List of Effective Documentary Units (the LESS is the reference)
- The list of Modifications
- The Summary of Highlights
- The front pages of all QRH sections
- The Table of Contents (TOC) of the General section
- The Table of Contents (TOC) of the Operations Engineering Bulletins section (the LEOEB is the reference)
- All pages numbered "00" and "00A" of the Operations Engineering Bulletins section (approval DU of the OEBs)
- This General Information (GEN.03) section

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# **ABNORMAL AND EMERGENCY PROCEDURES**

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**LOW ENERGY WARNING.....22.02**

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## CABIN OVERPRESSURE

Apply the following procedure (not displayed on ECAM) in case of total loss of the cabin pressure control leading to overpressure

PACK 1 or 2..... OFF

BLOWER + EXTRACT..... OVRD

*Cabin air is extracted overboard.*

$\Delta P$ ..... FREQUENTLY MONITOR

● **If  $\Delta P > 9$  PSI**

PACK 1+2..... OFF

LAND ASAP

Before 10 min from landing:

PACK 1+2..... OFF

BLOWER + EXTRACT..... AUTO

<b>CAUTION</b>	Check that $\Delta P$ is zero before opening the doors.
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## **LOSS OF FMS DATA IN DESCENT/APPROACH (SEVERE RESET)**

AP/FD lateral and vertical selected modes, and A/THR, are available immediately after the reset. If necessary, the pilot may perform the FCU selections for short-term navigation.

When the FMS has automatically recovered:

- The database cycle may have changed
- The FMGS does not autotune the ILS and ADF
- The FMS position bias is lost
- Lateral and vertical managed modes cannot re-engage
- The "CAB PR LDG ELEV FAULT" message is displayed on the ECAM
- A "MAP NOT AVAIL" message may be displayed on one ND.

Depending on the flight phase, apply the following procedure(s) as appropriate:

### **■ INITIAL APPROACH OR CLOSE TO ILS INTERCEPTION:**

#### **● When the system has recovered:**

Access the RAD NAV Page, and manually tune the ILS (preferably using IDENT). Enter the ILS course, if a frequency has been entered.

Fly in selected speed.

- Note:
- LOC and G/S guidance modes are available
  - VLS speed is still available and displayed on the PFD
  - Missed approach trajectory is not available.

### **■ DESCENT (IF TIME PERMITS) :**

#### **● When the system has recovered:**

Select the initial database

Perform DIR TO a downpath waypoint. Select heading, if required.


Perform a LAT REV at the downpath waypoint and redefine the DESTINATION in the NEW DEST field.

Redefine the arrival and/or the approach procedure.

Select the FUEL PRED Page, and enter the GW.

Activate the APPROACH phase.

Enter destination data on the PERF APPR Page, as required. Managed speed is available.

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LOW ENERGY WARNING		
<p>The “SPEED SPEED SPEED” synthetic voice sounds every 5 s whenever the aircraft energy goes below a threshold under which thrust must be increased.</p> <p>“SPEED SPEED SPEED”</p> <p><i>Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.</i></p>		



**ELEC EMER CONFIG SYS REMAINING**

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
AIR COND PRESS	PRESS AUTO SYS 1	Norm	Norm	Norm
	MAN PRESS CTL	Inop	Inop	Inop <sup>(a)</sup>
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop <sup>(a)</sup>
	AVIONIC VENT	Norm	Norm	Partial
FMGS	AFT CRG ISOL VALVE	Norm	Inop	Inop
	FMGC (NAV FUNCTION)	N° 1 only	Inop	Inop
	MCDU	N° 1 only	Inop	Inop
	FAC	N° 1 only	Inop	Inop
COM	FCU	ch 1 only	ch 1 only	ch 1 only
	VHF 1	Norm	Norm	Norm
	HF1	Norm	Inop	Inop
	RMP 1	Norm	Norm	Norm
	ACP (Capt, F/O)	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm
	CVR	Norm	Inop	Inop
	LOUDSPEAKER 1	Norm	Norm	Norm
EMER EQPT	CREW OXY	Norm	Norm <sup>(b)</sup>	Norm <sup>(b)</sup>
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	Inop	Inop	Inop <sup>(a)</sup>
	CARGO SMOKE DET	Channel 1	Inop	Inop
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	Inop	Inop	Inop <sup>(a)</sup>
FLT CTL	APU AUTO EXT.	Inop	Inop	Inop <sup>(a)</sup>
	ELAC	N° 1 only	N° 1+ N° 2	N° 1+ N° 2 <sup>(d)</sup>
	SEC	N° 1 only	N° 1	N° 1 <sup>(d)</sup>
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
FUEL	Flaps POS ind	Norm	Norm	Norm <sup>(c)</sup>
	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
HYD	TRANSFER VALVE	Norm	Inop	Inop
	FIRE VALVES	Norm	Norm	Norm
ICE - RAIN	WING A.ICE	Norm	Inop	Inop
	ENG A. ICE VALVE	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm <sup>(c)</sup>
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (CAPT)	Norm	Norm	Norm
EIS	PFD 1	Norm	Norm	Norm <sup>(c)</sup>
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm <sup>(c)</sup>
	DMC 1 or 3	Norm	Norm	Norm <sup>(c)</sup>
	SDAC 1, FWC 1	Norm	Norm	Norm <sup>(c)</sup>
FLT INS	ECAM CONT. panel	Norm	Norm	Norm
	CLOCKS	Norm	Norm	Norm
L/G	LGCIU SYS 1	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
LIGHTS	EMER CKPT	Norm	Norm	Norm
	EMER CAB	Norm	Norm	Norm



*Continued from the previous page*

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
NAV	IR	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>	N° 1 only <sup>(e)</sup>
	ADR	N° 1 only	N° 1 only	N° 1 only
	ADF	N° 1 only	Inop	Inop
	VOR-MMR	N° 1 only	N° 1 only	N° 1 only <sup>(c)</sup>
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm <sup>(c)</sup>
	ATC	N° 1 only	Inop	Inop
	STBY HORIZON	Norm	Norm	Norm
	STBY COMP (LT)	Norm	Norm	Norm
	STBY ALTI (VIB)	Norm	Inop	Inop
PNEU	ENG 1 BLEED	Norm	BMC 1 inop	BMC 1 inop
	ENG 2 BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop
	APU BLEED	Inop	Inop	Inop <sup>(a)</sup>
	X BLEED (MAN CTL)	Norm	Inop	Inop
APU	ECB - STARTER	Norm <sup>(f)</sup>	Inop	Inop <sup>(a)</sup>
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
PWR PLT	FADEC	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>	A + B <sup>(g)</sup>
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(a) Restored, when speed is below 100 kt.

(b) Crew oxygen valve inoperative.

(c) Lost, when speed is below 50 kt.


(d) Lost 30 s after last engine shutdown.

(e) IR2 and IR3 are lost 5 min after failure of the main generators. But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied

(f) For APU start only.

(g) Channels A and B are self-powered above 10 % N2. If N2 is below 10 % , only Channel A is powered.



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<b>ELEC EMER CONFIG SUMMARY</b>
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CRUISE	
MAX SPD.....	320 KT
ALTN LAW : PROT LOST ONLY CAPT PITOT AND AOA HEATED <b>FUEL:</b> CTR TK USABLE BY GRAVITY (2T UNUSABLE) <b>COM:</b> VHF1, ATC1, RMP1, only <b>NAV:</b> ILS1, VOR1, GPS1 (if MMR is installed) only	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR/140 kt

<b>W (1000 KG)</b>	52	56	60	64	68	72	76	80	84	88	92	94
<b>VREF = VLS CONF FULL</b>	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH
CAT 2 INOP MINIMUM RAT SPEED 140 KT SLATS FLAPS SLOW ● When L/G down: USE MAN PITCH TRIM.
LANDING
<b>FLARE:</b> Only 2 spoilers per wing. Direct law <b>SPOILERS:</b> Only 2 per wing <b>NO REVERSER</b> <b>BRAKING:</b> ALTERNATE without antiskid MAX BRK PR 1000 PSI <b>NO NOSEWHEEL STEERING</b>
GO-AROUND
NIL

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV										
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94
DRY runway	2 260	2 340	2 450	2 560	2 670	2 810	2 970	3 550	3 800	4 050
WET runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.20									
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.95									
CORRECTIONS	+1 000 ft above SL					+10 kt tailwind				
DRY Runway	+3 %					+16 %				

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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COCKPIT DOOR FAULT

This procedure should be applied, if the Cockpit Door Locking System (CDLS) fails. This failure is indicated when the FAULT light on the center pedestal's COCKPIT DOOR panel comes on.  
 In the case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's COCKPIT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.

CKPT DOOR CONT panel ..... CHECK

*This panel is located on the overhead panel. It is used to identify the faulty CDLS item, and to verify the status of the pressure sensors and the three electrical latches (referred to as strikes).*

● **If one or more electrical latches (strikes) are faulty:**

The cockpit door is not intrusion-proof if two or more electrical latches are faulty.

The system may be recovered by performing the following steps:

Cockpit door..... OPEN

COCKPIT DOOR sw..... SET to UNLOCK

After 30 s:

COCKPIT DOOR sw..... SET to NORM

● **If two pressure sensors are faulty:**

Automatic latch release is not available, in case of cockpit decompression.

● **If no LED on the CKPT DOOR CONT panel is on:**

The CDLS control unit is faulty, therefore, the cockpit door might unlock automatically. If it does not, consider using the mechanical override system to unlock the door.

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SMOKE/FUMES REMOVAL

EMER EXIT LIGHT..... ON

● **If fuel vapors:**

CAB FANS..... ON

PACK 1+2..... OFF

● **If no fuel vapors:**

CAB FANS..... OFF

ECON FLOW..... OFF

LDG ELEV..... 10 000 FT/MEA

DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

ATC..... NOTIFY

SMOKE/FUMES/AVNCS SMOKE PROC..... CONTINUE

*While descending, continue applying the appropriate steps of the SMOKE/FUMES/AVNCS SMOKE procedure depending on the suspected smoke source.*

● **At FL 100 or MEA**

APU MASTER SW (if in ELEC EMER CONF)..... ON

PACK 1+2..... OFF

MODE SEL..... MAN

MAN V/S CTL..... FULL UP

RAM AIR..... ON

APU MASTER SW..... OFF

● **If smoke persists, open CKPT window:**

MAX SPEED..... 200 KT

COCKPIT DOOR..... OPEN

HEADSETS..... ON

PNF COCKPIT WINDOW..... OPEN



**SMOKE/FUMES REMOVAL (Cont'd)**

- **When window is open:**  
NON AFFECTED PACK(s)..... ON  
VISUAL WARNINGS (noisy CKPT).. MONITOR  
SMOKE/FUMES/AVNCS SMOKE PROC.....  
..... CONTINUE

**SMOKE/FUMES/AVNCS SMOKE**

**LAND ASAP**

IF PERCEPTIBLE SMOKE APPLY IMMEDIATELY:

BLOWER..... OVRD

EXTRACT..... OVRD

CAB FANS..... OFF

GALY & CAB..... OFF

SIGNS..... ON

CKPT/CAB COM..... ESTABLISH

- IF REQUIRED:**  
 CREW OXY MASKS..... ON/100%/EMERG
- IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE, AND EXTINGUISHABLE:**  
 FAULTY EQPT..... ISOLATE
- IF SMOKE SOURCE NOT IMMEDIATELY ISOLATE:**  
 DIVERSION..... INITIATE  
 DESCENT (FL 100, or MEA, or minimum obstacle clearance altitude)..... INITIATE

**● AT ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT :**  
 SMOKE/FUMES REMOVAL..... CONSIDER  
 ELEC EMER CONFIG..... CONSIDER  
*Refer to the end of the procedure to Set ELEC EMER CONFIG*

**● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE :**  
 IMMEDIATE LANDING..... CONSIDER



**SMOKE/FUMES/AVNCS SMOKE (Cont'd)**

**AIR COND SMOKE/CAB EQUIPMENT SMOKE**

● **IF AIR COND SMOKE SUSPECTED:**

APU BLEED..... OFF  
BLOWER..... AUTO  
EXTRACT..... AUTO  
CARGO AFT ISOL VALVE..... OFF  
PACK 1..... OFF

● **If smoke continues:**

PACK 1..... ON  
PACK 2..... OFF

● **If smoke still continues:**

PACK 2..... ON  
BLOWER..... OVRD  
EXTRACT..... OVRD

SMOKE/FUMES REMOVAL..... CONSIDER

● **IF CAB EQUIPMENT SMOKE SUSPECTED:**

● **If smoke continues:**

EMER EXIT LIGHT..... ON  
COMMERCIAL..... OFF  
SMOKE DISSIPATION..... CHECK  
FAULTY EQPT..... SEARCH/ISOLATE

● **If smoke still continues or if faulty  
equipment confirmed isolated:**

COMMERCIAL..... NORM

SMOKE/FUMES REMOVAL..... CONSIDER







## SMOKE/FUMES/AVNCS SMOKE (Cont'd)

### UNDETERMINED/AVNCS/ELECTRICAL SMOKE

- IF SMOKE SOURCE CAN NOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED:  
ELEC EMER CONFIG..... CONSIDER
- IF SMOKE DISAPPEARS WITHIN 5 MINUTES:  
NORMAL VENTILATION..... RESTORE

### TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE.....OFF  
EMER ELEC PWR..... MAN ON

#### ● WHEN EMER GEN AVAIL:

APU GEN.....OFF  
GEN 2..... OFF

### ELEC EMER CONFIG

APPLY ECAM PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM.

#### ● AT 3 min OR 2 000 ft AAL BEFORE LANDING:

GEN 2.....ON  
EMER ELEC GEN 1 LINE.....ON

#### ● WHEN A/C IS STOPPED:

ALL GEN.....OFF

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## LANDING WITH SLATS OR FLAPS JAMMED

LANDING CONF..... CONF 3

■ **Repeat the following until landing configuration is reached:**

SPEED SEL..... VFE NEXT -5 kt

*Decelerate towards VFE NEXT -5 kt but not below VLS. In case of turbulence, to avoid VFE exceedance, the pilot may decide to decelerate to a lower speed, but not below VLS.*

Note:

- The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.
- Approach with selected speed is recommended.
- A/THR is recommended, except in the case of a G+B SYS LO PR warning.
- OVERSPEED warning and VLS, displayed on the PFD, are computed according to the actual flaps/slats position.
- VFE and VFE NEXT are displayed on the PFD according to the FLAPS' lever position. If not displayed, use the placard speeds.
- If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered.  
*In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **As speed reduces through VFE NEXT:**

FLAPS LEVER..... ONE STEP DOWN

■ **When landing configuration is established:**

DECELERATE TO CALCULATED APPROACH SPEED IN FINAL APPROACH

### FOR GO AROUND

The table below provides the MAX SPEEDS for the abnormal configurations.

■ **IF SLATS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION**

SELECT CLEAN CONFIGURATION

Recommended flaps retraction speed: between MAX SPEED -10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED -10 kt.

■ **IF FLAPS FAULT:**

● **FOR CIRCUIT:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **FOR DIVERSION:**

● **If FLAPS jammed at 0**

SELECT CLEAN CONFIGURATION

Note: Recommended speed for slats retraction is between MAX SPEED -10 kt and MAX SPEED of actual slat/flap position.



LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

Normal operating speeds

- If FLAPS jammed > 0

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED -10 kt

Note:


- In some cases, MAX SPEED -10 kt may be a few knots higher than the VFE. In this situation, pilot may follow the VFE.
- In case of a go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

MAX SPEED

Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	230 kt	215 kt	215 kt	195 kt	190 kt (Not allowed)
0 < S < 1						
S = 1						
1 < S ≤ 3	215 kt		215 kt	195 kt	190 kt	
S > 3	190 kt		190 kt	190 kt	190 kt	

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by 1.6 (SLATS EXTENDED) or 1.8 (FLAPS EXTENDED) or 2 (SLATS and FLAPS EXTENDED) to obtain the fuel consumption required to reach the destination in the current configuration.

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**SIDESTICK/RUDDER PEDALS STIFF**

Even if the autopilot is disengaged, the sidestick and/or the rudder pedals may be stiff. This may affect either:

- Both sidesticks (CAPT and F/O) at the same time, but not the rudder pedals, or
- One sidestick and the rudder pedals at the same time.

The piloting technique remains the same: The aircraft remains responsive.  
However, the flight crew should keep in mind that they may need to use extra force on the sidesticks and/or the rudder pedals.

AP DISENGAGEMENT..... CONFIRM

CONSIDER TRANSFERRING CONTROL TO PNF

- **FOR DECRAB, ROLLOUT, OR ENGINE FAILURE**  
BE PREPARED TO APPLY EXTRA FORCE ON RUDDER PEDAL



## RUDDER JAM

Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers. This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals. Use ECAM F/CTL SD page for a visual check of the rudder position.

### **FOR APPROACH**

**AVOID LANDING WITH CROSSWIND**

*from the side where the rudder is deflected.*

**MAX CROSSWIND for LDG 15 kt**

**AUTO BRK.....DO NOT USE**

**FOR LANDING.....USE NORMAL CONF**

**SPEED AND TRAJECTORY.....STABILIZE ASAP**

**LDG DIST PROC.....APPLY**

*Refer to QRH ABN 80 LDG CONF/ APPR SPD / LDG DIST following failures tables.*

### **ON GROUND**

**DIFFERENTIAL BRAKING.....USE ASAP**

*Do not use asymmetric reverse thrust.*

*Use nosewheel steering handle below 70 kt.*

**STABILIZER JAM**

The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.  
The flight control normal law remains active in this case and there is no ECAM warning.

AP..... OFF  
MAN PITCH TRIM.....CHECK

*The pitch trim wheel may not be fully jammed, the force needed may be higher than usual.*

● **IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

*If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on ECAM F/CTL page).*

**APPR PROC**

● **IF MAN TRIM NOT AVAIL:**

FOR LDG.....USE FLAP 3

*Do not select configuration full so as not to degrade the handling qualities.*

GPWS LDG FLAP 3..... ON

CAT 2 INOP



FUEL IMBALANCE

FOB..... CHECK  
*Compare the FOB + FU, with the FOB at departure.  
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.*

CAUTION	A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. <i>Refer to ABN-28 FUEL LEAK.</i>
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FUEL X FEED..... ON  
CTR TK L+R XFR..... OFF

- On the lighter side:  
FUEL PUMPS.....OFF
- When fuel is balanced:  
FUEL PUMPS..... ON  
CTR TK L+R XFR..... ON  
FUEL X FEED..... OFF

## FUEL LEAK

A fuel leak may be detected, if:

- The sum of FOB and FU significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- A tank is overflowing (due to pipe rupture in a tank), or
- The Fuel flow is excessive (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

### WHEN A LEAK IS CONFIRMED

LAND ASAP

#### ■ LEAK FROM ENGINE/PYLON CONFIRMED:

Engine fuel leak can be confirmed by excessive fuel flow indication, or a visual check.

THR LEVER (of affected engine)..... IDLE  
 ENG MASTER (of affected engine)..... OFF  
 FUEL X FEED..... USE AS RQRD

*If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

#### ■ LEAK FROM ENGINE/PYLON NOT CONFIRMED or LEAK NOT LOCATED:

Stop any fuel transfer, and then monitor the depletion rate of each wing tank, to determine if the leak is from an engine or a wing (case 1), or from the Center tank or the APU feeding line (case 2).

FUEL X FEED..... MAINTAIN CLOSED

*The crossfeed valve must remain closed to prevent the leak from affecting both sides.*

CTR TK L+R XFR..... OFF

*Each engine is fed via its associated wing tank only.*

WING TANK FUEL QUANTITIES..... MONITOR

*Monitor the depletion rate of each wing tank.*

#### ■ CASE 1 : IF ONE WING TANK DEPLETES FASTER THAN THE OTHER BY AT LEAST 300 kg (660 lb ) IN LESS THAN 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE  
 ENG MASTER (engine on leaking side)..... OFF  
 FUEL LEAK..... MONITOR

##### ● If leak stops:

If the wing tank fuel quantity of the affected side stops decreasing, the engine leak is confirmed and stopped.

CTR TK L+R XFR..... ON  
 FUEL X FEED..... USE AS RQRD

*The crossfeed valves can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings. Do not restart the engine.*

##### ● If leak continues (after engine shutdown):

The wing tank fuel quantity of the affected side continues to decrease. If the leak has not stopped after engine shut down, a leak from the wing may be suspected.



FUEL LEAK (Cont'd)

ENGINE RESTART..... CONSIDER  
CTR TK XFR (non-leaking side)..... ON

CAUTION	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.
---------	----------------------------------------------------------------------------------------------------------------------

■ CASE 2 : IF BOTH WING TANKS DEplete AT A SIMILAR RATE:

A leak from the Center tank or the APU feeding line may be suspected.

● If fuel smell in the cabin:

APU (if ON)..... OFF  
*This prevents additional fuel loss through the APU feeding line.*

● When fuel quantity in one wing tank is less than 3 t (6 600 lb ):

CTR TK L+R XFR..... ON

FOR LANDING

CAUTION	Do not use reversers.
---------	-----------------------

GRVTY FUEL FEEDING

ENG MODE SEL..... IGN  
AVOID NEGATIVE G FACTOR

● DETERMINE GRAVITY FEED CEILING:

Consult the following table to determine the flight altitude limitation.

Flight conditions at time of gravity feeding	Gravity feed ceiling
Flight time above FL 300 more than 30 min (Fuel deaerated)	Current FL <sup>(1)</sup>
Flight time above FL 300 less than 30 min (Fuel non-deaerated)	FL 300 <sup>(1)</sup>
Aircraft flight level never exceeded FL 300 (Fuel non-deaerated)	FL 150 <sup>(1)</sup> , or 7 000 ft above takeoff airport, whichever is higher

(1) For JET B, gravity feed ceiling is FL 100 in all cases.

DESCEND TO GRVTY FEED CEILING (if applicable).

● WHEN REACHING GRVTY FEED CEILING:

FUEL X FEED..... OFF


● IF NO FUEL LEAK AND FOR AIRCRAFT HANDLING:

If no fuel leak, and for flight with only one engine running (this engine being fed by gravity), apply the following :


FUEL X FEED..... ON  
BANK ANGLE..... 1° WING DOWN ON LIVE ENGINE SIDE  
RUDDER TRIM..... USE

● WHEN FUEL IMBALANCE REACHES 1 000 kg (2 200 lb):


BANK ANGLE..... 2° or 3° WING DOWN ON LIVE ENG SIDE

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ACT UNUSABLE PROC		
ACT..... AUTO <i>This stops the pump dry running.</i>		

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## HYD B + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/.77  
 MANEUVER WITH CARE  
 Flight controls remain in normal law.

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 10 kt + APPR COR

W (1 000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW/FLAPS SLOW  
 GPWS LDG FLAP 3..... ON  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE** Only one ELEV and two spoilers per wing  
**SPOILERS** Only 2 per wing  
**REVERSER** Only N°1  
**BRAKING** NORMAL  
**NO NOSEWHEEL STEERING**

### GO-AROUND

NO GEAR RETRACTION. Increased fuel consumption

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV <sup>(1)</sup>										
WEIGHT (1000 KG)	58	62	66	70	74	78	82	86	90	94
<b>DRY runway</b>	1 400	1 450	1 520	1 590	1 650	1 740	1 840	2 200	2 350	2 500
<b>WET runway</b>	1 880	1 980	2 090	2 220	2 330	2 450	2 580	2 780	2 960	3 100
<b>CONTA runway</b>	Refer to QRH FPE-IFL Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.75									

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
<b>DRY runway</b>	+ 3 %	+ 16 %
<b>WET runway</b>	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

HYD G + B SYS LO PR SUMMARY

CRUISE

SPD BRK.....	DO NOT USE
MAX SPD.....	320/0.77
MANEUVER WITH CARE	
ALTN LAW : PROT LOST	
LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 25 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

APPROACH

CAT 2 INOP
SLATS JAMMED/FLAPS SLOW
ATHR..... OFF
GPWS LDG FLAP 3..... ON
● WHEN SPD 200 KT
L/G..... GRVTY EXTN
● WHEN L/G down: USE MAN PITCH TRIM
For Flaps extension: SPD SEL..... VFE NEXT- 5KT
When in landing CONF: DECELERATE TO CALCULATED VAPP

LANDING

FLARE:	Only one ELEV and two spoilers per wing. No ailerons. A/C slightly sluggish – Direct law
SPOILERS:	Only 2 per wing
REVERSER:	Only N°2
BRAKING:	ALTERNATE
NO NOSE WHEEL STEERING	

GO-AROUND

NO GEAR RETRACTION. Increased fuel consumption
● For circuit:
MAINTAIN SLATS/FLAPS CONFIGURATION
Recommended speed: MAX SPD - 10 kt
● For diversion:
SELECT CLEAN CONFIGURATION
If Slats at zero: Normal operating speeds
If Slats not at zero: Recommended speed MAX SPD -10 kt


ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV<sup>(1)</sup>

WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94
DRY runway	1 520	1 580	1 650	1 730	1 800	1 890	2 000	2 390	2 560	2 720
WET runway	2 030	2 150	2 270	2 400	2 520	2 660	2 790	3 010	3 200	3 360
CONTA runway	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 1.80									

<sup>(1)</sup> If the credit of the remaining reverser needs to be taken into account, Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80).

CORRECTIONS	+ 1 000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 16 %
WET runway	+ 4 %	+ 21 %

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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## HYD G + Y SYS LO PR SUMMARY

### CRUISE

MAX SPD..... 320/0.77  
 MANEUVER WITH CARE  
 ALTN LAW : PROT LOST

LANDING CONF	APPROACH SPEED
Use FLAP 3	VAPP = VREF + 30 kt

W (1000 KG)	52	56	60	64	68	72	76	80	84	88	92	94
VREF = VLS CONF FULL	116	121	125	129	133	137	141	144	148	151	155	157

### APPROACH

CAT 2 INOP  
 SLATS SLOW / FLAPS JAMMED  
 GPWS FLAP MODE..... OFF  
 ● **For Flaps extension:**  
 SPD SEL..... VFE NEXT - 5KT  
 When in landing CONF : DECELERATE TO CALCULATED VAPP  
 Stabilize at VAPP before L/G down, to be trimmed for approach.  
 L/G GRAVITY EXTENSION

### LANDING

**FLARE:** PITCH AUTHORITY REDUCED (No stabilizer).  
 MAN TRIM Unusable  
 Only 1 spoiler per wing – Direct law  
**SPOILERS:** Only 1 per wing  
**NO REVERSER**  
**BRAKING:** BRK Y ACCU PR ONLY (7 applications)  
 MAX BRK PR 1 000 PSI  
**NO NOSEWHEEL STEERING**

### GO-AROUND


NO GEAR RETRACTION. Increased fuel consumption  
 ● **For circuit:**  
 MAINTAIN SLATS/FLAPS CONFIGURATION  
 Recommended speed: MAX SPD - 10 kt  
 ● **For diversion:**  
 ● **If Flaps at zero:**  
 SELECT CLEAN CONFIGURATION  
 Normal operating speeds  
 ● **If Flaps not at zero:**  
 MAINTAIN SLATS/FLAPS CONFIG  
 Recommended speed: MAX SPD - 10 kt

ACTUAL LANDING DISTANCES (m) WITH FAILURE WITHOUT REV											
WEIGHT (1 000 KG)	58	62	66	70	74	78	82	86	90	94	
<b>DRY runway</b>	2 050	2 130	2 230	2 330	2 430	2 550	2 700	3 230	3 450	3 680	
<b>WET runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.05										
<b>CONTA runway</b>	Refer to the Landing Distance table without Autobrake (CONF FULL) and apply LDG DIST Factor = 2.00										
<b>CORRECTIONS</b>	<b>+ 1 000 ft above SL</b>					<b>+ 10 kt tailwind</b>					
<b>DRY runway</b>	+ 3 %					+ 16 %					

The method for approach speed computation is given in the QRH ABN 80 (Refer to VAPP Calculation).

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**DOUBLE AOA HEAT FAILURE**

- If icing conditions cannot be avoided:  
 One of affected ADRs..... OFF  
 NAV ADR DISAGREE

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## DISPLAY UNIT FAILURE

### ■ AFFECTED DU FLASHES INTERMITTENTLY:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. It is evidenced by one, or a combination, of the following:

- Flashing of PFD, ND, ECAM DUs (blank screen or diagonal line),
- Flashing of MCDU,
- Intermittent flight control law reversion.

### ■ IF THE CAPTAIN SIDE IS AFFECTED:

Captain PFD, captain ND, Upper ECAM or MCDU 1 is(are) affected.

GEN 1.....OFF

#### ■ If DUs do not stop flashing:

GEN 1..... ON

#### ■ If DUs stop flashing:

GEN 1.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ IF THE FIRST OFFICER SIDE IS AFFECTED:

First officer PFD, first officer ND, lower ECAM or MCDU 2 is(are) affected.

GEN 2.....OFF

#### ■ If DUs do not stop flashing:

GEN 2..... ON

#### ■ If DUs stop flashing:

GEN 2.....KEEP OFF

*Keep the generator OFF for the rest of the flight.*

RUD TRIM..... CHECK/RESET

*Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim. Check the need of the rudder trim to be reset using the sideslip indication.*

AP and/or A/THR.....AS RQRD

APU START..... CONSIDER

### ■ AFFECTED DU IS BLANK or the DISPLAY IS DISTORTED:

DU (affected).....AS RQRD

*The DU can be switched off.*

ECAM/ND XFR (if the ECAM DUs are affected)..... USE

*Transfer SD to F/O or CAPT ND.*

PFD/ND XFR (if the EFIS DUs are affected).....USE

### ■ DIAGONAL LINE ON THE AFFECTED DU:

This failure may be caused by a DMC FAULT, or a communication interruption between the DMC and DU.

EIS DMC SWITCHING..... AS RQRD



DISPLAY UNIT FAILURE (Cont'd)

- **If unsuccessful:**  
DU (affected)..... OFF THEN ON  
  
*Note:     The ND display may disappear, if too many waypoints and associated information are displayed. Reduce the range, or deselect WPT or CSTR, and the display will automatically recover, after about 30 s.*
- **INVERSION OF THE EWD AND THE SD:**  
ECAM UPPER DISPLAY .....OFF THEN ON  
*The same action on the EIS DMC SWITCHING selector produces the same effect.*





## ECAM SINGLE DISPLAY

Only the EWD is available. There is no SD on the other DUs.

■ **To call a SYS page:**

PRESS AND MAINTAIN the SYS Page key on the ECP.

■ **OVERFLOW ON THE STATUS Page:**

PRESS AND MAINTAIN the STS key on the ECP

*The first page of STATUS appears.*

RELEASE IT, THEN PRESS AGAIN WITHIN 2 s

*The second page of STATUS appears.*

CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS.

*When the STS key is released for more than 2 s, the EWD reappears.*

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LOSS OF BRAKING

- IF NO BRAKING AVAILABLE:  
REV ..... MAX  
BRAKE PEDALS..... RELEASE  
A/SKID & N/W STRG..... OFF  
BRAKE PEDALS..... PRESS  
MAX BRK PR..... 1000 PSI
- IF STILL NO BRAKING:  
PARKING BRAKE..... SHORT AND SUCCESSIVE APPLICATIONS

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<b>RESIDUAL BRAKING PROC</b>		
<p>● <b>IN FLIGHT:</b>          BRAKE PEDALS.....APPLY SEVERAL TIMES  <i>Press the brake pedals several times. This could set to zero the residual pressure on the alternate system.</i></p> <p>● <b>IF RESIDUAL PRESSURE REMAINS:</b>          A/SKID &amp; N/W STRG selector..... KEEP ON</p> <p>■ <b>IF AUTOBRAKE IS AVAILABLE:</b>          FOR LANDING..... AUTO/BRK MED  <i>Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.</i></p> <p>■ <b>IF AUTOBRAKE IS NOT AVAILABLE:</b>          JUST AFTER TOUCHDOWN.....APPLY BRAKING  <i>Pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.</i></p> <p>Beware of possible braking asymmetry after touchdown, which can be controlled by using the pedals.</p> <p><u>Note:</u>    <i>If tire damage is suspected after landing, inspection of the tires is required before taxi.</i>  <i>If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :</i></p> <ol style="list-style-type: none"> <li><i>1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 kt when turning.</i></li> <li><i>2. If two tires are deflated on the same main gear (the other main gear tires not being deflated) speed should be limited to 3 kt, and the nose wheel steering angle should be limited to 30 °.</i></li> </ol>		



## L/G GRAVITY EXTENSION

### CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible L/G GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

*Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.*

L/G lever..... DOWN

GEAR DOWN indications (if available)..... CHECK

#### Note:

1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
2. In the event of gravity extension, caused by the failure of both LGCIUs, landing gear position indications on ECAM are lost. LDG GEAR light on LDG GEAR control panel remain available, if LGCIU 1 is electrically supplied.
3. The L/G LGCIU 2 FAULT or BRAKES SYS 1(2) FAULT warning may be spuriously triggered after a gravity extension.
4. If the three green downlock arrows are not on, it is possible that the handcrank is not at the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

### CAUTION

Nosewheel steering is lost.

#### ■ If successful:

Do not reset the free-fall system: This will avoid such undesirable effects as further loss of fluid, in the event of a leak, or possible landing gear unlocking, in the event of a gear selector valve jamming in the UP position.

#### Note:

*The free-fall system may be reset in flights being used for training. If the green hydraulic system is available, resetting the free-fall system allows the landing gear doors to be closed and the nosewheel steering to operate.*

*The flight crew should not reset the free-fall system on the ground after flight.*

#### ■ If unsuccessful:

LDG WITH ABNORMAL L/G procedure..... APPLY

LDG WITH ABNORMAL L/G

<b>CAUTION</b>	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the <b>WHEEL</b> SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible <u>L/G</u> GEAR NOT DOWN ECAM alert at 750 ft RA and any possible GPWS "TOO LOW GEAR" aural alert.
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### PREPARATION

CABIN CREW.....NOTIFY  
 ATC.....NOTIFY  
 GALLEY.....OFF

*Consider fuel reduction to a safe minimum.*

● **If NOSE L/G abnormal:**

CG location (if possible).....AFT  
 - 10 passengers from front to rear moves the CG roughly 4 % aft.  
 - 10 passengers from mid to rear moves the CG roughly 2.5 % aft.

● **If one MAIN L/G abnormal:**

FUEL IMBALANCE.....CONSIDER  
*Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.*

OXYGEN CREW SUPPLY.....OFF  
 SIGNS.....ON  
 CABIN and COCKPIT.....PREPARE  
 - Loose equipment secured.  
 - Survival equipment prepared.  
 - Belts and shoulder harness locked.

### APPROACH

GPWS SYS.....OFF  
 L/G lever.....CHECK DOWN  
 GRVTY GEAR EXTN handcrank.....TURN BACK TO NORMAL  
 AUTOBRAKE.....DO NOT ARM  
 EMER EXIT LT.....ON  
 CABIN REPORT.....OBTAIN  
 A/SKID & N/W STRG.....OFF  
 MAX BRAKE PR.....1000 PSI

● **If one or both MAIN L/G abnormal:**

GROUND SPOILERS.....DO NOT ARM

### BEFORE LANDING

RAM AIR.....ON  
 BRACE FOR IMPACT.....ORDER

● **If the external light condition is poor at landing:**

DOME LT.....DIM

### FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.

Engine pumps continue to supply adequate hydraulic pressure for 30 s after first engine shutdown.





## LDG WITH ABNORMAL L/G (Cont'd)

REVERSE..... DO NOT USE

● **If NOSE L/G abnormal:**

NOSE..... MAINTAIN UP

*After touchdown, keep the nose off the runway by use of the elevator. Then, lower the nose on to the runway before elevator control is lost.*

BRAKES (compatible with elevator efficiency)..... APPLY

ENG MASTERS..... OFF

*Shutdown the engines before nose impact.*

● **If one MAIN L/G abnormal:**

ENG MASTERS..... OFF

*At touchdown, shut down both engines.*

FAILURE SIDE WING..... MAINTAIN UP

*Use roll control, as necessary, to maintain the unsupported wing up as long as possible.*

DIRECTIONAL CONTROL..... MAINTAIN

*Use rudder and brakes (maximum 1 000 PSI) to maintain the runway axis as long as possible.*

● **If both MAIN L/G abnormal:**

ENG MASTERS..... OFF

*Shut down the engines in the flare, before touchdown.*

PITCH ATTITUDE (at touchdown)..... NOT LESS THAN 6°

### WHEN A/C STOPPED

ENG (all) and APU FIRE pushbutton..... PUSH


*Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*

ENG (all) and APU AGENT..... DISCH

■ **If Evacuation required:**

EVACUATION..... INITIATE

- All emergency and passenger doors may be used to evacuate the aircraft.

- Announce an appropriate command such as "PASSENGER EVACUATION-EVACUATE THROUGH LH or RH DOORS" using the Passenger Address (PA) system, and press the EVAC COMMAND pushbutton .

■ **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY

*Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).*

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## ADR 1 + 2 + 3 FAULT

The ECAM does not display this procedure. In the case of a triple ADR failure, the ECAM only displays dual ADR warnings.

ADR P/B (all)..... OFF  
STBY INST..... USE

Note: Disregard ECAM actions for AIR DATA SWTG and ATC since these have no effect in the case of a total loss of ADRs.

### ASSOCIATED PROCEDURES

## F/CTL ALTN LAW

### (PROT LOST)

MAX SPEED..... 320/0.82

See the following table for the IAS/M relationship for 0.82

FL	390	370	350	330	310	290	280 and below
MAX SPD	252	265	278	290	305	315	320

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

Note: Use manual control of cabin pressurization.

MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

### STATUS

MAX SPEED..... 320/0.82

RUD WITH CARE ABV 160 kt

See <sup>(1)</sup>

### APPR PROC:

FOR LDG..... USE FLAP 3

GPWS LDG FLAP 3.....ON

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

Refer to QRH ABN 80 LDG CONF / APPR SPD / LDG DIST following failures tables

### ● FOR L/G GRVTY EXTN (not on the ECAM):

GRVTY GEAR EXTN handcrank.....

.....PULL AND TURN


L/G LEVER.....DOWN

WHEN L/G DN : DIRECT LAW

### INOP SYS

ATT LIMIT  
OVSP LIMIT  
ALPHA LIMIT  
ADR 1+2+3  
WINDSHEAR DET  
RUD TRV LIM 1+2  
A/THR  
AP 1+2  
GPWS

### Other INOP SYS

CAB PR 1+2  
RAT auto extension  
ATC ALTI MODE  
TCAS   
L/G RETRACT




ADR 1 + 2 + 3 FAULT (Cont'd)

- DURING FINAL APPR  
V/S CTL..... FULL UP

Note: In case of a go-around, respect maximum speed 215 kt in CONF 1+F, due to the loss of flap auto retraction to CONF 1.

<b>CAUTION</b>	Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.
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<sup>(1)</sup> At slats' extension, full rudder travel authority is recovered.

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**NAV FM / GPS POS DISAGREE**

The FMS and GPS positions differ by more than a longitude threshold that depends on the latitude:

- 0.5 min for latitudes below 55 ° ,
- 0.9 min for latitudes at or above 55 ° and below 70 ° ,
- or a latitude threshold of 0.5 min, regardless of the latitude.

A/C POS.....CHECK

The following procedure is not displayed on the ECAM:

- **If the message occurs during ILS/LOC approach (LOC green):**  
DISREGARD it.

- **If the message occurs in climb, cruise, or descent:**

CHECK navigation accuracy, using raw data.

- **If the check is positive:**

NAV mode and ND ARC/ROSE NAV may be used.

- **If the check is negative:**

HDG/TRK mode and raw data must be used.

When possible, compare the FM position versus the GPIRS position, on the POSITION MONITOR page:

- **If one FM position agrees with the GPIRS position on the POSITION MONITOR page:**

Use the associated FD/AP.

- **If not:**

Deselect GPS and revert to basic information.

- **If the message occurs during a Non Precision Approach (NPA):**

- **Overlay approach:**

SELECT HDG, or TRK, and use raw data.

- **GPS or RNAV approach:**

GO AROUND, or fly visual, if visual conditions are met.



## EGPWS ALERTS

### CAUTION

During night or IMC conditions, apply the procedure immediately. Do not delay reaction for diagnosis.

During daylight VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take positive corrective action until the alert stops or a safe trajectory is ensured.

### ● "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP" – "OBSTACLE AHEAD PULL UP":

Simultaneously:

AP ..... OFF

PITCH ..... PULL UP

*Pull to full backstick and maintain in that position.*

THRUST LEVERS ..... TOGA

SPEED BRAKES lever ..... CHECK RETRACTED

BANK ..... WINGS LEVEL or ADJUST

#### ● When flight path is safe and the warning stops:

Decrease pitch attitude and accelerate.

#### ● When speed is above VLS, and vertical speed is positive:

Clean up aircraft as required.

### ● "TERRAIN TERRAIN" "TOO LOW TERRAIN":

Adjust the flight path or initiate a go-around.

### ● "TERRAIN AHEAD"-"OBSTACLE AHEAD":

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on analysis of all available instruments and information.

### ● "SINK RATE" "DON'T SINK":

Adjust pitch attitude and thrust to silence the alert.

### ● "TOO LOW GEAR" - "TOO LOW FLAPS":

Perform a go-around.

### ● "GLIDE SLOPE":

Establish the aircraft on the glideslope, or set the G/S MODE pb to OFF, if flight below the glideslope is intentional (non precision approach (NPA)).

IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND). Aircraft attitude and heading may be recovered by applying the following procedure.  
Aircraft must stay level with constant speed during 30 s.

- MODE SELECTOR..... ATT  
*ALIGN light on during 30 s.*  
*ATT MODE displayed on CDU.*
- LEVEL A/C ATTITUDE..... HOLD
- CONSTANT A/C SPEED..... MAINTAIN
- DISPLAY SYS switch..... AFFECTED SYS
- DISPLAY DATA switch..... HDG

■ MCDU INITIALIZATION:

- DATA (MCDU KEY)..... PRESS  
*The DATA INDEX page is displayed.*
- IRS MONITOR (2L KEY).....PRESS  
*The IRS MONITOR page is displayed.*
- A/C HEADING..... ENTER  
*The flight crew must enter the heading in the SET HDG field (5R KEY).*

■ CDU INITIALIZATION:

Depending on the CDU keyboard installed, an “H” may be written on the “5” key:

■ If “H” is written on the “5” key:

- H KEY.....PRESS  
*Degree marker, 0 decimal point, ENT and CLR lights come on.*
- A/C HEADING..... ENTER

■ If “H” is not written on the “5” key:

- A/C HEADING..... ENTER  
*Enter aircraft magnetic heading on CDU keyboard. Then press ENT key to enter data.*  
*Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.*  
*Heading will be displayed on the associated ND.*  
*“HDG–ATT MODE” will be displayed on CDU.*

Due to IR drift, magnetic heading has to be periodically crosschecked with standby compass and updated if required.



## TCAS WARNINGS

■ **Traffic advisory: “TRAFFIC” messages:**

Do not perform a maneuver based on a TA alone.

■ **Resolution advisory : All “CLIMB” and “DESCEND” or “MAINTAIN VERTICAL SPEED MAINTAIN” or “ADJUST VERTICAL SPEED ADJUST” or “MONITOR VERTICAL SPEED” type messages**

AP (if engaged)..... OFF

BOTH FDs..... OFF

Respond promptly and smoothly to an RA by adjusting or maintaining the pitch, as required, to reach the green area and/or avoid the red area of the vertical speed scale.

*Note: Avoid excessive maneuvers while aiming to keep the vertical speed just outside the red area of the VSI, and within the green area. If necessary, use the full speed range between  $V_{\alpha max}$  and  $V_{MAX}$ .*

Respect stall, GPWS, or windshear warning.

Notify ATC.

● **GO AROUND procedure must be performed when an RA “CLIMB” or “INCREASE CLIMB” is triggered on final approach:**

*Note: Resolution Advisories (RA) are inhibited below 900 ft.*

■ **When “CLEAR OF CONFLICT” is announced:**

Resume normal navigation in accordance with ATC clearance.

AP/FD can be re-engaged as desired.

UNRELIABLE SPEED INDICATION/ADR CHECK PROC

- If the safe conduct of the flight is impacted:

MEMORY ITEMS

AP/FD..... OFF

A/THR..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15°/TOGA

Above THRUST RED ALT and Below FL 100..... 10°/CLB

Above THRUST RED ALT and Above FL 100..... 5°/CLB

FLAPS..... Maintain current CONFIG

SPEEDBRAKES..... Check retracted

L/G..... UP

When at, or above MSA or Circuit Altitude:

Level off for troubleshooting

GPS ALTITUDE..... Display on MCDU

- To level off for troubleshooting:

AP/FD..... OFF

A/THR..... OFF

*Note: Check the actual slat/flap configuration on ECAM, since flap auto-retraction may occur.*

PITCH/THRUST FOR INITIAL LEVEL OFF				
SLATS/FLAPS EXTENDED				
		Above 81 t	81 t-68 t	Below 68 t
CONF	Speed	Pitch (°)/Thrust (% N1)		
3	F	4.0/70.7	4.0/66.4	4.0/61.5
2	F	7.0/68.9	7.0/64.6	7.0/59.9
1 + F	S	3.5/67.6	3.0/63.8	3.0/58.6
1	S	7.5/65.5	7.5/61.4	7.5/56.5
CLEAN				
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200 -FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

FLYING TECHNIQUE TO STABILIZE SPEED :

Adjust pitch in order to fly the required flight path.  
When target pitch is reached, flying intended flight path, adjust thrust to target:  
*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust;*  
*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

WHEN FLIGHT PATH IS STABILIZED

PROBE/WINDOW HEAT.....ON

TECHNICAL RECOMMENDATIONS:

- Respect Stall Warning  
To monitor speed, refer to IRS Ground Speed, or GPS Ground Speed variations
- If remaining altitude indication is unreliable:  
Do not use FPV and/or V/S, which are affected.  
ATC altitude is affected. Notify the ATC.





## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

Refer to GPS altitude: altitude variations may be used to control level flight, and is an altitude cue.

Refer to Radio Altimeter.

<b>CAUTION</b>	If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.
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### AFFECTED ADR IDENTIFICATION:

Crosscheck all speed indications and *Refer to the Operating Speeds table of the FPE In Flight Performance QRH Section (for F, S speeds) or Refer to Severe Turbulence table of QRH Operational Data Section in clean*

#### ■ If at least one ADR is reliable:

Faulty ADR(s)..... OFF  
 REMAINING AIR DATA..... CONFIRM

*Alternate sources may be used to evaluate the air data:*

- GPS altitude
- GPS and IRS Ground Speeds, taking into account altitude and wind effect.

#### ■ If affected ADR(s) cannot be identified or all ADRs are affected:

ONE ADR..... KEEP ON  
*Keep one ADR ON to maintain the STALL WARNING protection.*

TWO ADRs..... OFF  
*This prevents the flight control laws from using two coherent but unreliable ADR data.*

LDG CONF..... USE FLAP 3

APP SPD..... VLS +10

LDG DIST PROC..... APPLY

*Refer to the LDG CONF/APPR SPD/LDG DIST tables (QRH ABN 80)*

#### ■ To return to departure airport:

Keep takeoff configuration preferably.

*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Approaches (Pitch & Thrust Tables)*

#### ■ To accelerate and clean up after takeoff:

Accelerate and clean up the aircraft in level flight:

THRUST..... CLB

FLAPS..... RETRACT

Retract from 3 or 2 to 1, once CLB thrust is set.

Retract from 1 to 0, when the aircraft pitch is lower than the pitch for S speed (*Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Level-Off (Pitch & Thrust Table)*)

Once in clean configuration, *Refer to ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

### ■ Other cases:

Refer to *ABN-34-C UNRELIABLE SPEED INDICATION/ADR CHECK PROC - Climb/Cruise/Descent (Pitch & Thrust Tables)* for flight continuation.

### CLIMB

Set the thrust to CL.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 50	270 kt	8.5/CLB	9.0/CLB	10.0/CLB
FL 50 - FL 100		8.0/CLB	8.0/CLB	9.0/CLB
FL 100 - FL 150		7.0/CLB	7.0/CLB	8.0/CLB
FL 150 - FL 200		6.0/CLB	6.0/CLB	6.5/CLB
FL 200 - FL 250	300 kt	4.0/CLB	4.0/CLB	4.0/CLB
FL 250 - FL 280		3.5/CLB	3.0/CLB	3.0/CLB
Above FL 280	M 0.76	3.5/CLB	3.5/CLB	3.5/CLB

### CRUISE

Adjust N1 to maintain approximate level flight with pitch attitude held constant.

When time permits *Refer to Operational Data (OPS SEVERE TURBULENCE)* and adjust pitch to maintain level flight.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Below FL 200	270 kt	3.5/69.0	2.5/66.1	1.5/63.7
FL 200-FL 280	300 kt	2.0/78.9	1.5/75.9	1.0/73.9
Above FL 280	M 0.76	2.5/83.7	2.5/81.6	2.0/79.0

### DESCENT

Set the thrust to IDLE.

CLEAN				
		Above 81 t	81 t -68 t	Below 68 t
FL	Speed	Pitch (°)/Thrust (% N1)		
Above FL 280	M 0.76	-1.0/IDLE	-1.5/IDLE	-2.0/IDLE
FL 280-FL 200	300 kt	-0.5/IDLE	-1.5/IDLE	-2.5/IDLE
FL 200 - FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-1.5/IDLE
Below FL 100	270 kt	0.5/IDLE	-0.5/IDLE	-2.0/IDLE
Below FL 100	G-DOT	2.0/IDLE	2.0/IDLE	2.0/IDLE

### INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

The approach phase between Green Dot speed (clean configuration) and the landing configuration (CONF 3), is flown in level flight.

LANDING GEAR UP IN LEVEL FLIGHT				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
0	G-DOT	5.0/63.4	5.0/59.4	5.0/54.6
1	S	7.5/65.6	7.5/61.4	7.5/56.6
1+F <sup>(1)</sup>	S	3.5/67.6	3.0/63.8	3.0/58.6
2	F	7.0/68.5	7.0/64.7	7.0/59.9



## UNRELIABLE SPEED INDICATION/ADR CHECK PROC (Cont'd)

LANDING GEAR DOWN IN LEVEL FLIGHT (EXPECT GRVTY EXTENSION)				
3	F	4.0/74.8	4.0/71.0	4.0/65.8

*(1) Due to the fact that the speed is unreliable, the SFCC may select the 1+F configuration in approach, instead of 1.*

### FINAL APPROACH AT STANDARD - 3 ° DESCENT FLIGHT PATH

LANDING GEAR DOWN				
		Above 81 t	81 t - 68 t	Below 68 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS + 10	2.0/60.0	2.0/56.0	1.5/51.6

**FLYING TECHNIQUE TO STABILIZE SPEED:**

Adjust pitch in order to fly the required flight path.

When target pitch is reached, flying intended flight path, adjust thrust to target.

*If the aircraft pitch tends to increase, aircraft is slow, then increase thrust.*

*If the aircraft pitch tends to decrease, aircraft is fast, then decrease thrust.*

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>BLANK</b>
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## AIR DUAL BLEED FAULT

### ■ If ENG1 BLEED was lost due to a:

LEAK on side 1

ENG 1 FIRE

Start Air Valve 1 failed open.

DESCENT TO FL100/MEA..... INITIATE

*Descend rapidly to FL 100/MEA, to prevent excessive cabin altitude.*

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ If ENG 2 BLEED was lost due to a:

LEAK on side 2

ENG 2 FIRE

Start Air Valve 2 failed open.

X BLEED..... CHECK CLOSED

DESCENT TO FL200/MEA..... INITIATE

*Descend rapidly to FL 200, to recover the bleed supply from the APU.*

APU..... START

*Start the APU during the descent.*

#### ● AT, OR BELOW, FL200 :

WING A.ICE..... OFF

*APU BLEED must not be used for wing anti-ice.*

APU BLEED..... ON

MAX FL200

AVOID ICING CONDITIONS

#### ● IF ICE ACCRETION

APPR SPD..... VLS + 10 KT

LDG DIST PROC..... APPLY

*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

### ■ In all other cases :

DESCENT..... INITIATE

*Descend rapidly to FL 200, so that the bleed supply may be supplied by the APU, if the bleed system recovery is not successful.*

#### ● If both packs are available :

If both packs are operative, it can be suspected that the second bleed system failed due to excessive demand. Recovery of the second failed engine bleed may be attempted.

#### ■ If ENG 1 BLEED is lost first :

PACK 1..... OFF

ENGINE 2 BLEED..... ON

#### ■ If ENG 2 BLEED is lost first :

PACK 2..... OFF

ENGINE 1 BLEED..... ON



AIR DUAL BLEED FAULT (Cont'd)

- If engine bleed recovery was not successful, or if one pack is inoperative :  
 X BLEED..... CHECK OPEN  
 DESCENT TO FL200/MEA.....CONTINUE  
*Descend rapidly to FL 200, to recover the bleed supply from the APU*  
 APU.....START  
*Start the APU during the descent.*
- AT, OR BELOW, FL200 :  
 WING A.ICE..... OFF  
*APU BLEED must not be used for wing anti-ice.*  
 APU BLEED..... ON  
 MAX FL200  
 AVOID ICING CONDITIONS
  - IF ICE ACCRETION  
 APPR SPD.....VLS + 10 KT  
 LDG DIST PROC..... APPLY  
*Refer to FCOM-QRH ABN 80 LDG CONF/APPR SPD/LDG DIST Tables.*

## ENG DUAL FAILURE - FUEL REMAINING

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

**LAND ASAP**

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THR LEVERS..... IDLE  
 FAC 1.....OFF THEN ON  
 ENG MODE SEL.....IGN

Then, as long as none of the engines recover, apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.

OPTIMUM RELIGHT SPD.....280 KT

*Note: In the case of an "ENG DUAL FAILURE" during high power operations (i.e. climb, cruise), it is mandatory to fly at or above the optimum relight speed in order to prevent engine core lock.*

*In the case of a speed indication failure (volcanic ash), Pitch attitude for optimum relight speed is:*

WEIGHT	Pitch (°)
At or below 60 000 kg/132 000 lb	-2.5
70 000 kg/154 000 lb	-1.5
80 000 kg/176 000 lb	-0.5

*At 280 kt, the aircraft can fly up to about 2.4 nm per 1 000 ft (with no wind).*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached, or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE

ATC.....NOTIFY

● **IF NO RELIGHT AFTER 30 SEC:**

ENG MASTERS.....OFF 30 S/ON

*Unassisted start attempts can be repeated until successful, or until APU bleed is available.*

● **IF UNSUCCESSFUL:**

CREW OXY MASKS (Above FL 100).....ON

● **WHEN BELOW FL 250**

APU (IF AVAIL).....START

● **WHEN BELOW FL 200**

WING ANTI ICE.....OFF

APU BLEED.....ON

ENG MASTERS (one at a time).....OFF 30 S/ON



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

- When APU bleed is available or if engine restart is definitively considered impossible:  
OPTIMUM SPEED.....REFER TO TABLE BELOW

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
94	251	261	271
92	248	258	268
88	242	252	262
86	239	249	259
84	236	246	256
82	233	243	253
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind).  
Average rate of descent is approximately 1 700 ft/min

CABIN AND COCKPIT.....PREPARE  
CABIN SIGNS.....ON  
COMMERCIAL.....OFF  
USE RUDDER WITH CARE

- WHEN BELOW FL 150  
RAM AIR.....ON

APPROACH PREPARATION

Note: Final descent slope, when configured (CONF 3 and L/G DOWN) will be approximately 1.1 nm per 1 000 ft (with no wind).

BARO.....SET  
CREW MASKS/OXY SUPPLY (below FL 100).....OFF

IF FORCED LANDING ANTICIPATED

APPROACH  
FOR LDG.....USE FLAP 3  
Only slats extend, and slowly.  
MIN APPR SPEED.....160 KT





## ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

VAPP..... DETERMINE

*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- **At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN):**

- **When in CONF 3 and VAPP:**

GRAVITY GEAR EXTN handcrank..... PULL AND TURN

*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*

- **When L/G downlocked**

L/G lever..... DOWN

APPROACH SPEED..... ADJUST

*Adjust the speed to the above given Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*

GND SPLR..... ARM

MAX BRK PR..... 1000 PSI

### AT 2 000 FT AGL

CABIN..... NOTIFY FOR LANDING

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS..... OFF

APU MASTER SW..... OFF

BRAKES ON ACCU ONLY

### AFTER LANDING

- **When the aircraft has stopped:**

PARKING BRK..... ON

ATC..... NOTIFY

FIRE pushbutton (ENG and APU)..... PUSH

AGENTS (ENG and APU)..... DISCH

*Engine Agent 2 is not available.*

- **If Evacuation required:**

EVACUATION..... INITIATE

ELT  ..... CHECK EMITTING

*If not, switch on the transmitter.*

- **If Evacuation not required:**

CABIN CREW and PASSENGERS (PA)..... NOTIFY



ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell.*  
*If that causes a strong crosswind, ditch into the wind.*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
APU MASTER SW..... OFF

AFTER DITCHING

ATC (VHF 1).....NOTIFY  
FIRE pushbutton (ENG and APU).....PUSH  
AGENT (ENG and APU)..... DISCH  
*Engine Agent 2 is not available.*  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter.*

**ENG DUAL FAILURE - NO FUEL REMAINING**

Apply first the following actions required by the ECAM ENG DUAL FAILURE (if not already done) :

EMER ELEC PWR (if EMER GEN not in line).....MAN ON  
 THRUST LEVERS..... IDLE  
 FAC 1.....OFF THEN ON

*Then apply the following paper procedure, and if time permits, clear ECAM alerts, and check the ECAM STATUS page.*

OPTIMUM SPEED.....240 KT/GREEN DOT


*Initially, fly 240 kt, because the PFD may not display the correct green dot speed. Then fly the green dot speed according to the following table:*

GREEN DOT SPEED WITH ALL ENGINES INOPERATIVE (KNOTS)			
Weight (1 000 kg)	At or below FL 200	FL 300	FL 400
80	230	240	250
78	227	237	247
76	224	234	244
74	221	231	241
72	218	228	238
70	215	225	235
68	212	222	232
66	209	219	229
64	206	216	226
62	203	213	223
60	200	210	220
58	197	207	217
56	194	204	214
54	191	201	211
52	188	198	208

*At green dot speed, the aircraft can fly up to approximately 2.5 nm per 1 000 ft (with no wind). Average rate of descent is approximately 1 700 ft/min .*

LANDING STRATEGY.....DETERMINE

*Determine whether a runway can be reached or the most appropriate place for a forced landing/ditching.*

VHF1/HF1  /ATC1.....USE  
 ATC..... NOTIFY  
 CREW OXY MASKS (Above FL 100).....ON  
 CABIN AND COCKPIT..... PREPARE  
 SIGNS.....ON  
 COMMERCIAL..... OFF

USE RUDDER WITH CARE

● **WHEN BELOW FL 150**

RAM AIR..... ON

**COMMON ACTIONS FOR THE APPROACH**

**APPROACH PREPARATION**

*Note: Final descent slope, when configured (CONF 3; L/G DOWN), will be approximately 1.1 N/m per 1 000 ft (with no wind).*

BARO..... SET  
 CREW MASKS/OXY SUPPLY (below FL 100)..... OFF



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF FORCED LANDING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt.*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN)
  - When in CONF 3 and VAPP  
GRAVITY GEAR EXTN handcrank..... PULL AND TURN  
*Flight controls revert to direct law at landing gear extension. Wait for CONF 3 and VAPP before extending the landing gear to enable the aircraft to be trimmed for approach. Disregard "USE MAN PITCH TRIM" on the PFD, because the stabilizer is frozen in the position where it was at, when the windmilling was insufficient to provide hydraulic power.*
  - When L/G downlocked  
L/G lever..... DOWN  
APPROACH SPEED..... ADJUST  
*Adjust the speed to the determined Vapp. Nevertheless, to reach the landing field/runway, the approach speed may be adjusted up to 215 kt (max speed with slats extended).*  
  
GND SPLR..... ARM  
MAX BRK PR..... 1000 PSI

AT 2 000 FT AGL

CABIN.....NOTIFY FOR LANDING


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF  
BRAKES ON ACCU ONLY

AFTER LANDING

- When the aircraft has stopped :  
PARKING BRK.....ON  
ATC.....NOTIFY
  - If Evacuation required :  
EVACUATION.....INITIATE  
ELT  .....CHECK EMITTING  
*If not, switch on the transmitter*
  - If Evacuation not required :  
CABIN CREW and PASSENGERS (PA).....NOTIFY



ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)

IF DITCHING ANTICIPATED

APPROACH

FOR LDG.....USE FLAP 3  
*Only slats extend, and slowly.*  
MIN APPR SPEED..... 160 KT  
VAPP..... DETERMINE  
*Vapp is the maximum between VREF + 30 kt/160 kt:*

Weight (1 000 kg)	52	56	60	64	68	72	76	80	84	88	92	94
Vapp	160	160	160	160	163	167	171	174	178	181	185	187

- At a suitable altitude (not below 3 000 ft AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)  
L/G lever..... CHECK UP

AT 2 000 FT AGL

CABIN..... NOTIFY FOR DITCHING  
DITCHING pushbutton..... ON  
*Prefer ditching parallel to the swell*  
*If that causes a strong crosswind, ditch into the wind..*  
*In all cases, touch down with a pitch attitude of approximately 11 °.*  
*Minimize aircraft vertical speed.*


AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

AT TOUCHDOWN

ENG MASTERS..... OFF

AFTER DITCHING

ATC (VHF 1).....NOTIFY  
EVACUATION..... INITIATE  
ELT  ..... CHECK EMITTING  
*If not, switch on the transmitter*


## ENG RELIGHT (IN FLIGHT)

- |                                       |           |
|---------------------------------------|-----------|
| MAX ALTITUDE.....                     | See below |
| ENG MASTER (affected).....            | OFF       |
| THR LEVER (affected).....             | IDLE      |
| ENG MODE SEL.....                     | IGN       |
| X BLEED .....                         | OPEN      |
| WING A. ICE (for starter assist)..... | OFF       |
| ENG MASTER (affected).....            | ON        |

*Be aware that, contrary to an autostart on ground, the crew must take appropriate action in case of an abnormal start.*

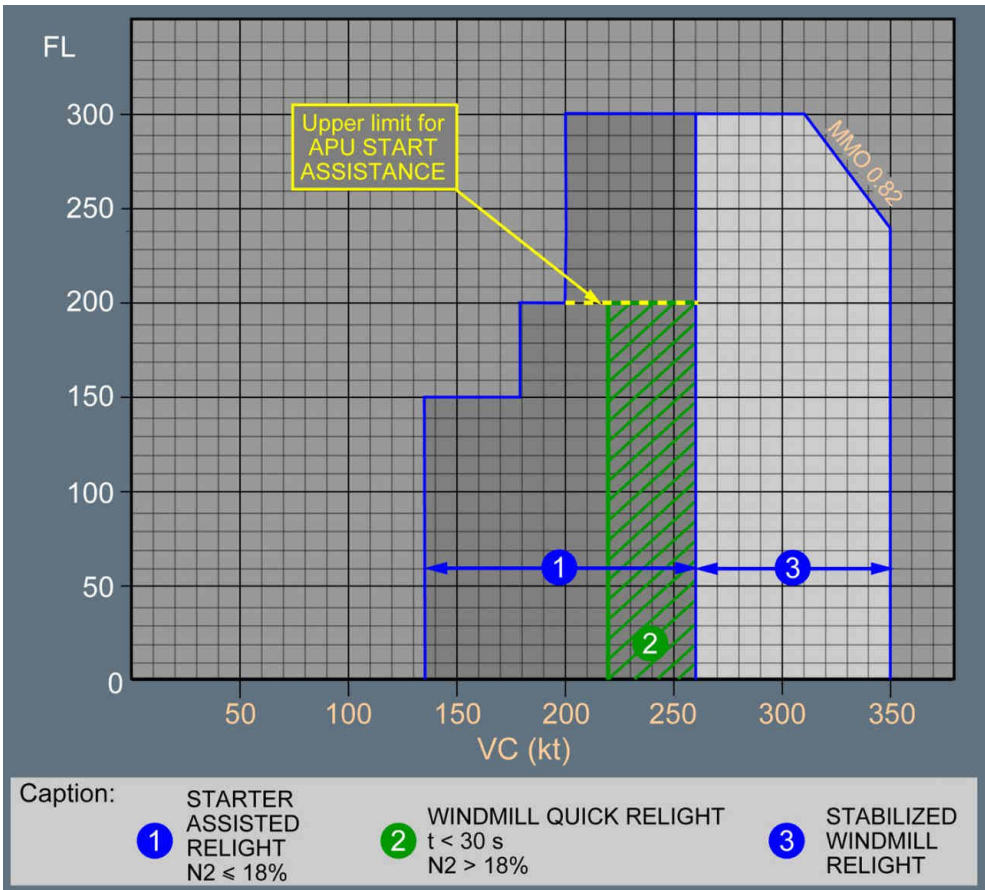
*Engine light up should be achieved within 30 s after fuel flow increases.*

■ **When idle is reached (AVAIL indication pulses in green) :**

- |                                                                                                       |             |
|-------------------------------------------------------------------------------------------------------|-------------|
| ENG MODE SEL.....                                                                                     | NORM        |
| TCAS MODE SEL  ..... | check TA/RA |
- Check that the selector is at TA/RA since, if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at the TA position.*
- |                   |         |
|-------------------|---------|
| Affected SYS..... | RESTORE |
|-------------------|---------|

■ **If no relight :**

- |                            |     |
|----------------------------|-----|
| ENG MASTER (affected)..... | OFF |
|----------------------------|-----|
- Wait 30 s before attempting a new start (to drain the engine).*





## **ENG 1(2) STALL**

■ **On the ground :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

■ **In flight :**

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

■ **IF ABNORMAL :**

ENG MASTER (AFFECTED ENGINE)..... OFF

————— ASSOCIATED PROCEDURES —————

## **ENG 1(2) SHUT DOWN**

■ **Normal :**

ENG A.ICE (AFFECTED ENGINE).....ON

WING A.ICE..... ON

THR LEVER (AFFECTED ENGINE).....SLOWLY ADVANCE

● **If a stall recurs :**

THR LEVER (AFFECTED ENGINE).....REDUCE

● **If a stall does not recur :**

Continue engine operation.

ENG TAILPIPE FIRE

CAUTION

External fire agents can cause severe corrosive damage and should, therefore, only be considered after having applied following procedure :

MAN START..... OFF  
ENG MASTER (affected).....OFF  
AIR BLEED PRESS..... ESTABLISH  
BEACON..... ON  
ENG MODE SEL.....CRANK  
MAN START..... ON

● When burning has stopped :

MAN START.....OFF  
ENG MODE SEL..... NORM





## HIGH ENGINE VIBRATION

### ■ High N2 vibrations during engine start on ground :

Engine start should be aborted (if vibration indications are available), when the N2 vibration level exceeds the 6.5-units advisory threshold. The subsequent start is to be initiated after the engine has completely spooled down. This procedure may be repeated a maximum of three times. Report any N2 vibration advisory condition in the logbook.

### ■ High N1 or N2 vibrations in operation :

The ECAM's VIB advisory (N1  $\geq$  5 units, N2  $\geq$  5 units) is mainly a guideline to induce the crew to monitor engine parameters more closely.

**VIB detection alone does not require engine shutdown.**

- Note:
1. High engine vibrations may be accompanied by cockpit and cabin smoke, and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
  2. High N1 vibrations are generally accompanied by perceivable airframe vibrations. High N2 vibrations can occur without perceivable airframe vibrations.

### ■ IF NO ICING CONDITIONS :

ENG PARAMETERS.....CHECK

*Check engine parameters and especially EGT ; crosscheck with the other engine. Report in the maintenance log.*

#### ● If rapid increase above the advisory :

THRUST LEVER (affected engine).....RETARD

*Flight conditions permitting, reduce N1 to maintain the vibration level below the advisory threshold.*

- Note: *If the VIB indication does not decrease following thrust reduction, this may indicate other engine problems. Apply the adequate procedure.*

### ■ IF ICING CONDITIONS :

An increase in engine vibrations in icing conditions, with or without engine anti-ice, may be due to fan blades and/or spinner icing.

A/THR.....OFF

ENGINE ANTI-ICE.....CHECK

*If ENG ANTI-ICE is off, switch it ON at idle fan speed, one engine after the other at an approximate 30 s interval.*

THRUST LEVER (one engine at a time).....INCREASE THRUST

*Increase thrust to a setting compatible with the flight phase. The VIB level will return to normal after ice is shed, despite a slight increase during acceleration. Resume normal operation.*

- Note: *When vibrations above the advisory level have been experienced during the flight, and if possible, shut down the engine after landing, for taxiing.*

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CIRCLING APPROACH WITH ONE ENGINE INOPERATIVE

LANDING WEIGHT..... CHECK

- if the aircraft weight is above the maximum weight for circling in CONF 3 (given in the table below):

The aircraft cannot maintain flight level with CONF 3 and the landing gear down.

FOR LDG.....USE FLAP 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3..... ON

Delay gear extension.

- Note:
- If the approach is flown at less than 750 ft RA, the “L/G NOT DOWN” warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pb, located on the ECAM control panel.
  - A “TOO LOW GEAR” warning is to be expected, if the landing gear is not downlocked at 500 ft RA.

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	76	74	71	68	64	61	58	54
5	76	74	71	68	64	61	56	52
10	76	74	71	68	64	59	54	
15	76	74	71	67	61	57	52	
20	76	74	69	64	59	54		
25	76	71	66	61	56			
30	73	68	64	59	54			
35	69	65	61	57	52			
40	66	62	59	55				
45	63	60	57					
50	60	57						
55	57							

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

STRAIGHT-IN-APPROACH WITH ONE ENGINE INOPERATIVE

For performance reasons, do not extend flaps full until established on a final descent to landing.  
If a level off is expected during the final approach, perform the approach and landing in CONF 3.

## BOMB ON BOARD

**IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.**

*If it is not possible to land and evacuate the aircraft within 30 min, apply the following procedures :*

### **COCKPIT PROCEDURES**

#### **BACKGROUND**

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.

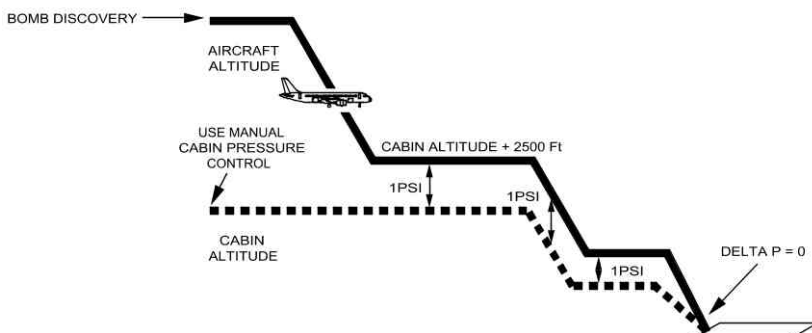
These conditions are achieved by using the manual pressure control.

#### **PROCEDURE**

The following procedure assumes that it is initiated during climb or cruise :

- First, maintain the cabin altitude.
- While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI .
- During further steps of descent, maintain delta P at 1 PSI .
- For landing, reduce the differential pressure to zero, until the final approach.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).



AIRCRAFT (if climbing).....	LEVEL OFF
CABIN PRESS MODE SEL.....	MAN
CAB ALT.....	MAINTAIN
CABIN CREW.....	NOTIFY
ATC/COMPANY OPERATIONS.....	NOTIFY
FUEL RESERVES.....	DETERMINE
<i>Keep in mind that when flying at cabin altitude + 2 500 ft , the fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.</i>	
NEXT SUITABLE AIRPORT.....	DETERMINE
FCU SPEED SELECTION KNOB.....	PULL AND TURN
<i>Select the most appropriate speed, taking into account the time to destination, the fuel consumption and the fact that low speed could reduce the consequences of possible structural damage, if the bomb explodes.</i>	
DESCENT TO CAB ALT +2 500 FEET or MEA or minimum obstacle clearance altitude.....	INITIATE
AVOID SHARP MANEUVERS	
CAB ALT.....	MAINTAIN



BOMB ON BOARD (Cont'd)

- **When at CAB ALT+ 2 500 ft:**  
1 PSI DELTA P..... MAINTAIN  
GALLEY..... OFF
  - **When the bomb is secured at the LRBL or cannot be moved:**  
EMER EXIT LT..... ON  
COMMERCIAL..... OFF  
  
FLAPS (fuel permitting)..... AT LEAST CONF 1  
*For landing, use normal configuration.*  
LANDING GEAR (fuel permitting, except for flight over water)..... DOWN
- **For any other steps of descent:**  
1 PSI DELTA P..... MAINTAIN
- **During approach:**  
CABIN PRESS MODE SEL..... AUTO
- **When aircraft on ground and stopped in a remote area (if possible) :**
  - **If evacuation required:**  
EVACUATION..... INITIATE  
*Avoid exits, and exiting on the same side as the bomb or near the bomb.*
  - **If evacuation not required:**  
CABIN CREW and PASSENGERS (PA)..... NOTIFY

CABIN PROCEDURES

If a suspect device is found in the cabin:


WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.
WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.
CAUTION	The least risk bomb location for aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD..... CHECK  
*Announce : "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

BOMB..... DO NOT OPEN  
BOMB..... DO NOT CUT WIRES  
BOMB..... SECURE AGAINST SLIPPING  
BOMB..... AVOID SHOCKS  
*Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.*

PASSENGERS..... LEAD AWAY FROM BOMB  
*Move passengers at least 4 seat rows away the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*  
*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest.*  
*Seat backs and tray tables must be in their full upright position.*  
*Service items may need to be collected in order to secure tray tables.*



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BOMB ON BOARD (Cont'd)

PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

*The cabin crews must command passengers to switch off all portable electronic devices.*

BOMB.....CHECK NO ANTI-LIFT DEVICE

*To check for an anti-lift switch or lever, slide a string or stiff card (such as the emergency information card) under the bomb, without disturbing the bomb.*

*If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.*

*If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.*

*If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e.g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.*

EMERGENCY EQUIPMENTS.....REMOVE AND STOW

*Emergency equipments (PBE, fire extinguisher, ...) located close to the LRBL must be removed and stowed in alternate location.*

GALLEY/IFE POWER.....OFF

*All galley and IFE equipments located close to the LRBL must be switched off.*

● If the bomb can be moved:

RH AFT CABIN DOOR SLIDE..... DISARM

LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

*Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*

*On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.*

*Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

CAUTION

DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

BOMB INDICATION LINE..... POSITION

*Note:*

*A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m ) line (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

*Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.*

BOMB..... MOVE TO LRBL

*Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

CAUTION

Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.





## BOMB ON BOARD (Cont'd)

LEAST RISK BOMB LOCATION (LRBL).....COMPLETE

*Place an additional single thin sheet of plastic over the bomb.*

<b>CAUTION</b>	<b>DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.</b>
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Build up at 25 cm (10 in ) of wetted material around the sides and on top of the bomb.

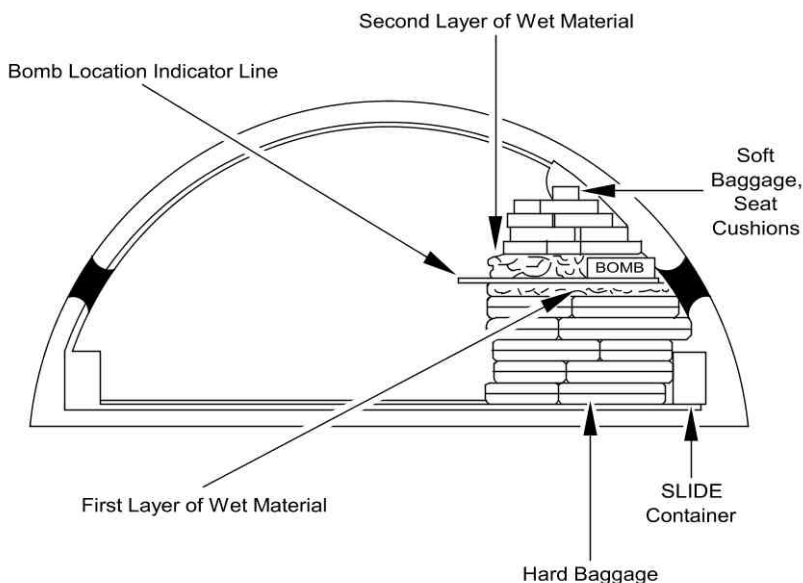
DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.

Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water on any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

### LRBL STACK



PASSENGERS.....MOVE/ADVISE


*Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

*Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.*

CABIN CREW..... NOTIFY COCKPIT CREW

*Cabin crew notify the flight crew that the bomb is secured at the LRBL.*



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BOMB ON BOARD (Cont'd)		
EVACUATION/DISEMBARKATION.....EXECUTE		
<i>Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".</i>		
<i>Use all available airport facilities to disembark without delay.</i>		





## DITCHING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure, which has been amended to include the ditching procedure when the engines are not running.*

### PREPARATION

ATC/TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions. Select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz.*

CABIN and COCKPIT.....PREPARE

*Loose equipment secured, survival equipment prepared, belts and shoulder harness locked.*

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SELECT 00

BARO.....SET

*Omit the normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### APPROACH

L/G lever..... UP

SLATS and FLAPS.....MAX AVAIL

### AT 2 000 FT AGL

CAB PRESS MODE SEL.....CHECK AUTO

BLEED (ENGs and APU).....OFF

CABIN.....NOTIFY FOR DITCHING

DITCHING pushbutton..... ON

*Prefer ditching parallel to the swell. If that causes a strong crosswind, ditch into the wind.*

*In all cases, touch down with a pitch attitude of approximately 11 °. Minimize aircraft vertical speed.*

### AT 500 FT AGL

BRACE FOR IMPACT..... ORDER

### AT TOUCHDOWN

ENG MASTERS.....OFF

APU MASTERS SW.....OFF

### AFTER DITCHING

ATC (VHF 1).....NOTIFY

FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENGs and APU).....DISCH

EVACUATION.....INITIATE

ELT.....CHECK EMITTING

*If not, switch ON the transmitter.*

FORCED LANDING

This procedure applies when engines are running. If engines are not running, *Refer to the QRH ABN 70 ENG DUAL FAILURE (with or without fuel remaining) procedure*, which has been amended to include the forced landing procedure, when the engines are not running.

### **PREPARATION**

ATC /TRANSPONDER (if available)..... NOTIFY/SELECT A7700

*Notify ATC of the nature of the emergency encountered, and state intentions.*

*If not in contact with ATC, select transponder code A7700, or transmit the distress message on: (VHF) 121.5 MHz or (HF) 2 182 kHz or 8 364 kHz .*

CABIN and COCKPIT.....PREPARE

- Loose equipment secured
- Survival equipment prepared
- Belts and shoulder harness locked.

GPWS SYS.....OFF

GPWS TERR.....OFF

SIGNS.....ON

EMER EXIT LT.....ON

COMMERCIAL.....OFF

LDG ELEV.....SET

BARO.....SET

*Omit normal approach and landing checklist.*

CREW MASKS/OXY SUPPLY (below FL 100).....OFF

### **APPROACH**

RAM AIR.....ON

L/G lever.....DOWN

SLATS AND FLAPS.....MAX AVAIL

GND SPLR.....ARM

MAX BRK PR.....1 000 PSI

### **AT 2 000 FT AGL**

CABIN.....NOTIFY FOR LANDING

### **AT 500 FT AGL**

BRACE FOR IMPACT.....ORDER

### **AT TOUCHDOWN**

ENG MASTERS.....OFF

APU MASTER SW.....OFF

BRAKES ON ACCU ONLY

### **AFTER LANDING**

#### ● **When aircraft has stopped:**

PARKING BRK.....ON

ATC (VHF 1).....NOTIFY


FIRE pushbutton (ENG and APU).....PUSH

AGENTS (ENG and APU).....DISCH

#### ■ **If Evacuation required:**

EVACUATION.....INITIATE



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FORCED LANDING (Cont'd)

ELT..... CHECK EMITTING  
*If not, switch on the transmitter.*

■ If Evacuation not required:

CABIN CREW and PASSENGERS (PA)..... NOTIFY

## EMER DESCENT

### IMMEDIATE ACTION

CREW OXY MASKS..... ON  
 EMER DESCENT.....ANNOUNCE(PA)

*The flight crew must inform the cabin of emergency descent on the PA system.*

SIGNS.....ON

*The recommendation is to descend with the AP engaged :*

- Turn the ALT selector knob and pull
- Turn the HDG selector knob and pull
- Adjust the target SPD/MACH.

THR LEVERS(if A/THR not engaged)..... IDLE

- If autothrust is engaged, check that THR IDLE is displayed on the FMA.
- If not engaged, retard the thrust levers.

SPD BRK..... FULL

*Extension of the speedbrakes will significantly increase Vls.*

*To avoid AP disconnection and automatic retraction of the speedbrakes, due to possible activation of Angle-of-Attack protection, allow the speed to increase before starting to use the speedbrakes.*


### WHEN DESCENT ESTABLISHED

EMER DESCENT FL100, or minimum allowable altitude.

SPEED.....MAX/APPROPRIATE

**CAUTION** Descend at the maximum appropriate speed. If structural damage is suspected, use the flight controls with care and reduce speed as appropriate.

*Landing gear may be extended below 25 000 ft. In such a case, speed must be reduced to VLO/VLE.*

Note: The recommendation is to descend with the autopilot engaged.  
 Use of the autopilot is also permitted in EXPEDITE mode .

ENG MODE SEL.....IGN

ATC.....NOTIFY

*Notify ATC of the nature of the emergency, and state intention. If not in contact with ATC, transmit a distress message on one of the following frequencies: (VHF) 121.5 MHz, or (HF) 2 182 kHz, or 8 364 kHz.*

ATC XPDR 7700.....CONSIDER

*Squawk 7700 unless otherwise specified by ATC.*

*To save oxygen, set the oxygen diluter selector to the N position. If the oxygen diluter selector remains at 100 %, the quantity of oxygen may not be sufficient for the entire emergency descent profile.*

MAX FL..... 100/MEA

#### ● IF CAB ALT > 14 000 ft:

PAX OXY MASKS..... MAN ON

*This action confirms that the passenger oxygen masks are released.*

Note: Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.

## OVERWEIGHT LANDING

**LDG CONF..... AS REQUIRED**

*Use the ECAM flap setting, if required for abnormal operations. In all other cases :*

- *FULL is preferred for optimized landing performance*
  - *If the aircraft weight is above the maximum weight for go-around (given in the table below), use FLAP 3 for landing.*
- In all cases, if landing configuration is different from FLAP FULL, use 1+F for go-around.*

Note:     *At very high weights, VFE CONF1 is close to VLS clean. To select CONF1, deselect A/THR, decelerate to (or slightly below) VLS and select CONF1 when below VFE. When established at CONF1, the crew can re-engage the A/THR and use managed speed again*

**LDG DIST.....CHECK**

**PACK 1 and 2.....OFF or supplied by APU**

*Selecting packs OFF (or supplied from APU) will increase the maximum thrust available from the engines in the event of a go-around.*

● **In the final approach stages**

**TARGET SPEED..... VLS**

*Reduce the selected speed on the FCU to reach VLS at runway threshold.*

*Touch down as smoothly as possible (Maximum V/S at touchdown 360 ft/min).*

● **At main landing gear touchdown**

**REVERSE THRUST..... USE MAX AVAILABLE**

● **After nosewheel touchdown**

**BRAKES.....APPLY AS NECESSARY**

*Maximum braking may be used after nose wheel touchdown. But, if landing distance permits, delay or reduce braking to fully benefit from the available runway length.*

● **Landing complete**

**BRAKE FANS ..... ON**

*Be prepared for tire deflation, if temperatures exceed 800 °C.*

MAXIMUM WEIGHT FOR GO AROUND IN CONF 3 (1 000 kg)								
OAT °C	AIRPORT ELEVATION (FT)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
<10	92	88	82	76	70	65	60	55
15	92	88	82	76	70	65	60	55
20	92	88	82	76	70	65	60	55
25	92	87	80	75	69	64	59	
30	92	85	79	73	68			
35	88	82	76	70	65			
40	85	79	73	68				
45	82	75	70					
50	78	72						
55								

# STALL RECOVERY

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

**NOSE DOWN PITCH CONTROL..... APPLY**  
*This will reduce angle of attack*

*Note: In case of lack of pitch down authority, reducing thrust may be necessary.*

**BANK..... WINGS LEVEL**

● **When out of stall (no longer stall indications) :**

**THRUST..... INCREASE SMOOTHLY AS NEEDED**

*Note: In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

**SPEEDBRAKES..... CHECK RETRACTED**  
**FLIGHT PATH..... RECOVER SMOOTHLY**

● **If in clean configuration and below 20 000 ft:**

**FLAP 1..... SELECT**

*Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

# STALL WARNING AT LIFT-OFF

Spurious stall warning may sound in NORMAL law, if an angle of attack probe is damaged. In this case, apply immediately the following actions:

**THRUST..... TOGA**

At the same time:

**PITCH ATTITUDE..... 15 °**  
**BANK..... WINGS LEVEL**

*Note: When a safe flight path and speed are achieved and maintained, if stall warning continues, consider it as spurious.*

TAILSTRIKE

In the event of a tailstrike, apply the following procedure:

LAND ASAP

MAX FL..... 100 or MSA  
*500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min , except for the final approach that must be performed normally.  
Notify the ATC of the aircraft's rate of climb.*

RAM AIR.....ON  
PACK 1 and 2..... OFF

VOLCANIC ASH ENCOUNTER

- If the aircraft enters a volcanic ash cloud:
 

180 ° TURN.....	INITIATE
ATC.....	NOTIFY
A/THR.....	OFF
THRUST (conditions permitting).....	REDUCE
CREW OXYGEN MASKS.....	ON/100 %/EMER
CABIN CREW.....	NOTIFY
PASSENGER OXYGEN.....	AS RQRD
ENG ANTI ICE.....	ON
WING ANTI ICE.....	ON
ECON FLOW.....	OFF

Note: If CARGO VENTILATION system is installed, it is recommended to switch off the CARGO ISOL VALVES, to prevent a cargo smoke warning being triggered.

- |                           |         |
|---------------------------|---------|
| APU.....                  | START   |
| ENGINE PARAMETERS.....    | MONITOR |
| AIRSPEED INDICATIONS..... | MONITOR |

If airspeed is unreliable or lost, Refer to the QRH ABN 34 Unreliable Speed Indication / ADR Check Proc procedure.

Note: If all engines flame out and speed indications are lost, Refer to QRH ABN 70 DUAL ENGINE FAILURE procedure, to get the required pitch attitude for the optimum relight speed.  
In case of engine failure, switch off the wing anti ice before engine restart.

Note: If sufficient visibility is not granted for approach due to windshield/window damage, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization.  
To manually depressurize the cabin:

- |                         |         |
|-------------------------|---------|
| CAB PRESS MODE SEL..... | MAN     |
| MAN V/S CTL.....        | FULL UP |

Due to the increased noise level, pay particular attention to visual warnings.





## WINDSHEAR AHEAD

The "W/S AHEAD" message is displayed on each PFD. The color of the message depends on the severity and location of the windshear.

**Note:** When a predictive windshear alert ("WINDSHEAR AHEAD" or "GO AROUND WINDSHEAR AHEAD") is triggered, if the flight crew makes a positive verification that no hazard exists, then the alert may be disregarded, as long as:

- There are no other signs of possible windshear conditions, and
- The reactive windshear system is operational.

*Known cases of spurious predictive windshear alerts have been reported at some airports, during either takeoff or landing, due to the specific obstacle environment. However, always rely on any reactive windshear ("WINDSHEAR").*

### W/S AHEAD RED

#### ■ Takeoff

Associated with an aural synthetic voice "WINDSHEAR AHEAD, WINDSHEAR AHEAD".

##### ● Before takeoff

Delay takeoff, or select the most favorable runway.

##### ● During the takeoff run

Reject takeoff.

**Note:** Predictive windshear alerts are inhibited above 100 kts until 50 ft.

##### ● When airborne

THR LEVERS.....TOGA

*As usual, the slat/flap configuration can be changed, provided the windshear is not entered.*

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

#### ■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

GO AROUND.....PERFORM

*This includes the use of full backstick, if required.*

- Note:**
1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
  2. If the FD is not available, use a pitch initial attitude up to 17.5 °. If necessary to minimize the loss of height, increase this pitch attitude.

### W/S AHEAD AMBER

Apply precautionary measures, as indicated below:

#### ■ Before TAKEOFF

Delay takeoff until conditions improve.

Evaluate takeoff conditions :

- Using observations and experience.
- Checking weather conditions.

Select the most favorable runway (considering location of the likely windshear).



## WINDSHEAR AHEAD (Cont'd)

Use the weather radar or the predictive windshear system before commencing takeoff to ensure that the flight path clears any potential problem areas.

Select TOGA thrust.

Monitor closely airspeed and airspeed trend during the takeoff run for early signs of windshear.

### ■ **During Approach**

Delay landing or divert to another airport until conditions are more favorable.

Evaluate condition for a safe landing by :

- Using observations and experience.
- Checking weather conditions.

Use the weather radar.

Select the most favorable runway, considering also which has the most appropriate approach aid.

Select FLAPS 3.

Use managed speed in the approach phase.

Check both FDs engaged in ILS, FPA or V/S.

Engage the autopilot, for a more accurate approach and earlier recognition of deviation from the beam, when ILS is available.

Note: - When it is using the GS mini-function, associated with managed speed, the system will carry extra speed in strong wind conditions.  
 - In case of strong or gusty crosswind greater than 20 kt, Refer to FPE-IFL VAPP Determination.

## WINDSHEAR

A red flag "WINDSHEAR" is displayed on each PFD associated with an aural synthetic voice "WINDSHEAR" repeated three times.

If windshear is detected by pilot observation, apply the following recovery technique:

### ■ **At takeoff**

#### ■ **If before V1**

The takeoff should be rejected only if significant airspeed variations occur below indicated V1 and the pilot decides that there is sufficient runway remaining to stop the airplane.

#### ■ **If after V1**

THR LEVERS..... TOGA  
 REACHING VR..... ROTATE  
 SRS ORDERS..... FOLLOW

*This includes the use of full backstick, if demanded.*

Note: 1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.  
 2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.





## WINDSHEAR (Cont'd)

### ■ Airborne, initial climb or landing

THR LEVERS AT TOGA.....SET OR CONFIRM

AP (if engaged).....KEEP

SRS ORDERS.....FOLLOW

*This includes the use of full backstick, if demanded.*


Note:

1. If engaged, the autopilot disengages when  $\alpha$  is greater than  $\alpha$  prot.
2. If the FD bars are not available, use an initial pitch attitude up to 17.5 ° with full backstick, if necessary. If needed, to minimize the loss of height, increase this pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF SHEAR.

CLOSELY MONITOR FLIGHT PATH AND SPEED.

RECOVER SMOOTHLY TO NORMAL CLIMB OUT OF SHEAR.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>80.11</b>
		30 MAR 12
<b>WINDSHIELD/WINDOW ARCING</b>		
<p>Affected WINDOW/WINDSHIELD ANTI ICE C/B.....PULL</p> <p><i>Pull the circuit breaker of the affected window/windshield heating system, in case of :</i></p> <ul style="list-style-type: none"><li>- <i>Electrical arcing of the cockpit windshield/window, or</i></li><li>- <i>Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.</i></li></ul> <p><i>On the rear C/B panel :</i></p> <ul style="list-style-type: none"><li>• ANTI ICE L WSHLD C/B AF10 (123VU)</li><li>• ANTI ICE R WSHLD C/B AF03 (123VU)</li><li>• ANTI ICE/WINDOWS L C/B X14 (122VU)</li><li>• ANTI ICE/WINDOWS R C/B W14 (122VU)</li></ul>		



## WINDSHIELD/WINDOW CRACKED

**DIAGNOSIS OF INNER PLY.....PERFORM**

*Touch the cracks with a pen (or carefully with fingernail) to determine if there is a crack on the cockpit side.*

■ **If no crack on cockpit side:**

No limitation

*The inner ply is not affected. Therefore, the window/windshield is still able to sustain the maximum differential pressure at the current flight level.*

■ **If cracks on cockpit side:**

**MAX FL.....230/MEA**

*The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. The maximum flight level is restricted to FL 230/MEA to obtain  $\Delta P$  5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.*

Note: The following procedure allows maintaining  $\Delta P$  5 PSI in manual cabin pressure mode.

**CAB PRESS MODE SEL.....MAN**

**MAN V/S CTL.....AS RQRD**

Set the cabin altitude, according to the table below:

$\Delta P = 5$ PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

● **When starting the descent for approach:**


**CAB PRESS MODE SEL.....AUTO**

Note: *If all front facing windows are affected and if sufficient visibility is not granted for approach, consider AUTOLAND. If AUTOLAND is not available, consider opening the sliding window on the PF's side, after cabin depressurization. To manually depressurize the cabin:*

**CAB PRESS MODE SEL.....MAN**

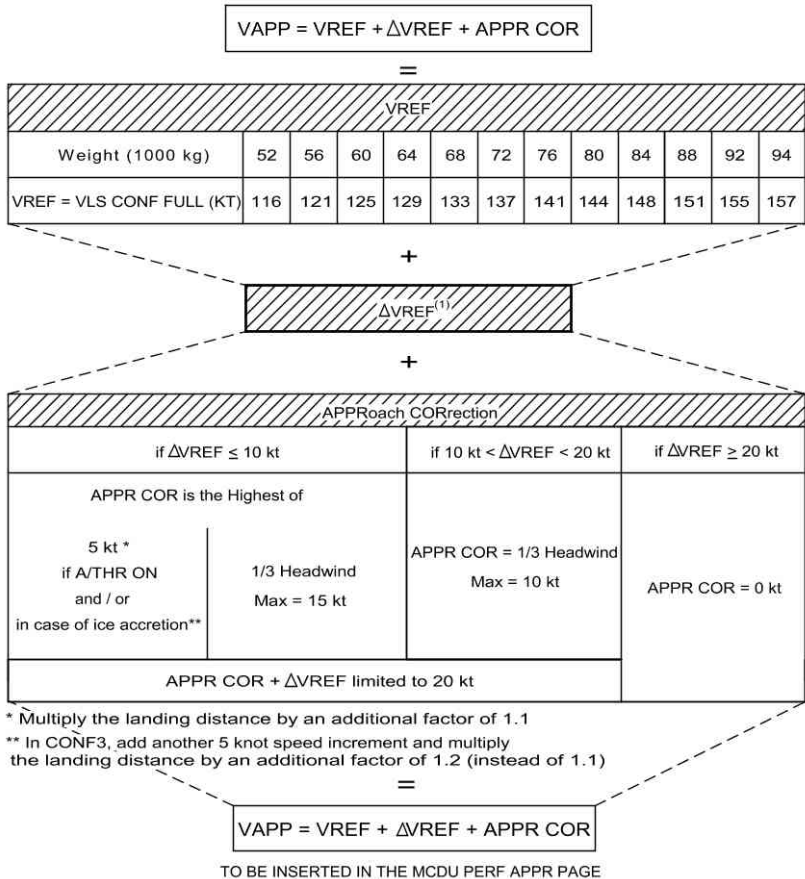
**MAN V/S CTL.....FULL UP**

*Due to the increased noise level, pay particular attention to visual warnings.*

 <b>DRAGONAIR</b> <b>A320/A321</b> <b>QUICK REFERENCE HAND BOOK</b>		<b>ABNORMAL AND EMERGENCY PROCEDURES</b>	<b>80.13</b>  30 MAR 12
<b>ECAM ADVISORY CONDITIONS</b>			
SYSTEM	CONDITIONS	RECOMMENDED ACTION	
CAB PRESS	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: MODE SEL (MAN) Wait 10 s, then: MODE SEL (AUTO)	
	CAB ALTITUDE altitude ≥ 8 800 ft	MODE SEL (MAN) Manual pressure control	
	CAB DIFF PRESS ΔP ≥ 1.5 PSI in phase 7	LDG ELEV (ADJUST) If unsuccessful: MODE SEL (MAN) Manual pressure control	
ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict generator use to a short time, if the temperature rises again excessively.	
FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT (CHECK) If a fuel leak is suspected, <i>Refer to FUEL LEAK procedure.</i>	
	Fuel temp greater than 45 °C in wing tank	GALLEY (OFF)	
	Fuel temp lower than -40 °C in wing tank	Consider descending to a lower altitude, and/or increasing Mach to increase TAT.	
APU	EGT > EGT MAX -33 °C (inhibited during APU start)		
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.	
ENG	OIL PRESS P < 80 PSI	<ul style="list-style-type: none"> <li>- If oil pressure is between 80 PSI and 60 PSI continue normal engine operation.</li> <li>- If oil pressure is below 60 PSI (red indication), without the <u>ENG OIL LO PR</u> warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty).</li> </ul> In both cases, monitor other engine parameters, especially oil temperature and oil quantity.	
	OIL PRESS P > 390 PSI	Closely monitor other engine parameters for symptoms of engine malfunction. If a high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight. Record high oil pressure, and corresponding N2 readings, for maintenance action.	
	OIL TEMP T > 155 °C	An oil temperature increase during normal steady-state operations indicates a system malfunction, and should be closely monitored for other symptoms of engine malfunction.  <u>Note:</u> <i>If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i>  <i>In addition, an oil temperature increase could be related to the IDG oil cooling system. To reduce oil temperature increases before limits are reached, the following is recommended:</i> <ol style="list-style-type: none"> <li>1. <i>Low Speed-</i> Increase engine speed to increase fuel flow, and thereby cool IDG oil.</li> <li>2. <i>High Speed-</i> Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.</li> </ol>	
	OIL QTY < 5 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.	
	NAC TEMP ≥ 320 °C	Monitor engine parameters and crosscheck with other engine.	
	VIBRATION N1 ≥ 5 units N2 ≥ 5 units	Refer to HIGH ENGINE VIBRATION procedure ( <i>Refer to ABN-70 HIGH ENGINE VIBRATION</i> ).	

VAPP CALCULATION

**VAPP CALCULATION IN THE CASE OF AN ABNORMAL/EMERGENCY CONFIGURATION**



(1) Refer to QRH ABN 80 LDG CONF/APPR SPD/LDG DIST following failures tables

**EXAMPLE OF VAPP CALCULATION:**


Failure : ALTN LAW  
 Flight Conditions : Autothrust ON, ice accretion  
 Landing Configuration : CONF 3  
 Headwind : 12 kt  
 Landing Weight/CG : 60 t  
 VREF determined from the landing weight : 125 kt  
 VREF correction due to the failure ( $\Delta VREF$ ) : 10 kt

As  $\Delta VREF$  is equal to 10 kt, the APPRoach CORrection (APPR COR) is the highest of:

- $5+5 = 10$  kt (ice accretion and landing in CONF 3)
- $1/3 \text{ Headwind} = 12 \text{ kt} / 3 = 4$  kt

APPR COR = 10 kt and the landing distance must be multiplied by an additional factor of 1.2

$VAPP = VREF + \Delta VREF + APPR\ CORR = 125 + 10 + 10 = 145$  kt

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## USE OF THE LDG CONF / APPR SPD / LDG DIST TABLES

### USE OF THE LDG DIST FACTORS

Use the **LDG DIST factors** “WITHOUT REV” when:

- All reversers are inoperative, or
- Maximum reverse thrust on available reverser(s) is not selected, or
- The aircraft has been dispatched with one or more reverser(s) inoperative.

Use the **LDG DIST factors** “WITH REV” when at least one reverser is operative and maximum reverse thrust is selected at landing.

Note: Not applicable if aircraft was dispatched with one reverser INOP. QRH Landing distance factors are based upon dispatch with both reversers operating.

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR AN INDEPENDENT FAILURE

Determine the FLAPS lever position for landing to be selected

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Determine the  $\Delta VREF$
- Determine the APPRoach CORrection (*Refer to ABN-80 VAPP Calculation*)

Compute the LDG DIST:

- Determine the LDG DIST factor. Multiply it by the additional factor, if any (*Refer to ABN-80 VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

### LDG CONF / APPR SPD / LDG DIST COMPUTATION FOR MULTIPLE FAILURES

Only combine PRIMARY or INDEPENDENT failures

Determine the Flaps lever position for landing to be selected:

- Use the lowest Flaps Lever Position for landing (i.e. if FULL and 3, use 3)

Compute the VAPP:  $VAPP = VREF + \Delta VREF + APPR\ COR$

- Use the highest  $\Delta VREF$  to compute VAPP
- Determine the APPRoach CORrection (*Refer to VAPP Calculation*)

Compute the LDG DIST:


- Determine the applicable LDG DIST factors in the same column (“WITH REV.” or “WITHOUT REV.”)
- Multiply the applicable LDG DIST factors together, unless all values are marked with an asterisk (\*). If all values are marked with an asterisk, use the highest LDG DIST factor. Multiply it by the additional factor, if any (*Refer to VAPP Calculation*)
- Multiply the obtained LDG DIST factor by the ACTUAL LANDING DISTANCE WITHOUT AUTOBRAKE – CONFIGURATION FULL – without reversers correction (*Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL*)

Examples applicable to Dry runways /A/THR ON / No wind / WITHOUT REV. / Without ice accretion:


FAILURES	Flaps Lever Position For Landing	$\Delta VREF$	APPR COR	Additional Factor	LDG DIST Factor
FLAPS FAULT (F < 3, S ≥ 1)	3	10	5	1.1	1.40*
BRK ANTI SKID	FULL	-			1.60
	3	6			1.75
	3	10			1.40x1.75x1.1=2.70
RESULT	3	10			

VREF = 131 kt. Therefore  $VAPP = 131 + 10 + 5 = 146$  kt..



<div> <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			<b>ABNORMAL AND EMERGENCY PROCEDURES</b>		<b>80.15A</b>
					30 MAR 12
FAILURES	Flaps Lever Position for Landing	Δ VREF	APPR COR	Additional Factor	LDG Factor
ALTN LAW	3	10	0	N/A	1.35*
FLAPS FAULT (F < 1, S ≥ 1)	3	30			1.95*
RESULT	3	30			1.95

VREF = 140 kt. Therefore VAPP = 140+30 = 170 kt.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - DRY RWY</b>
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DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.35
	DC ESS BUS <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	if there is no ice accretion				
	DC ESS BUS <sup>(b)</sup>	FULL 3	10 16	1.35 1.50	1.30 1.45
	if there is ice accretion				
	DC ESS SHED BUS <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	if there is ice accretion				
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	2.75 2.75	2.75 2.75
S/F	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.80 2.00	N/A N/A
	EMER ELEC CONF	3	10	2.75	N/A
	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.40*	2.20*
	FLAPS < 1				
	S<1	3	45	2.30*	2.10*
	S≥1	3	30	1.95*	1.75*
	1≤FLAPS<2				
	S<1	3	30	1.85*	1.70*
F/CTL	S≥1	3	15	1.50*	1.40*
	2≤FLAPS<3				
	S<1	3	25	1.70*	1.60*
	S≥1	3	10	1.40*	1.30*
	FLAPS=3				
	S<1	3	25	1.65*	1.55*
	1≤S≤3	3	10	1.35*	1.25*
	S>3	3	5	1.25*	1.20*
	FLAPS>3				
F/CTL	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.30*	1.25*
	S>3	FULL	5	1.25*	1.20*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.20 1.25
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.40	1.25 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.55	1.45 1.55
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	1.35 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.25 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.45 1.65	1.35 1.50
	SEC 1+2+3 FAULT	3	10	1.65	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.25*



*Continued from the previous page*


DRY RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				DRY WITHOUT REV <sup>(c)</sup>	DRY WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.35 1.45	1.30 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.15 1.25
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.20 1.30
	GREEN + BLUE	3	25	1.85	1.75
	GREEN + YELLOW	3	30	2.50	N/A
	BLUE + YELLOW	3	10	1.70	1.65
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.45	1.25 1.35
	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.60 1.75	1.50 1.60
BRK	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.30 1.45
	IR 1+2+3 FAULT	3	10	2.45	2.45
NAV	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.45*	1.35*
	DUAL IR FAULT/DUAL ADR FAULT / ADR 1+2+3 FAULT	3	10	1.35*	1.25*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35
	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	2.15* 1.35*	2.05* 1.30*
ENG	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.30 1.45	1.25 1.35

<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance DRY without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - WET RWY</b>
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WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta$ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.35
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.15 1.25	1.10 1.20
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.30 1.40	1.25 1.35
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.35	1.15 1.25
	DC EMER CONF	FULL 3	- 6	2.20 2.20	2.20 2.20
	DC BUS 1+2 <sup>(b)</sup>	FULL 3	- 6	1.40 1.50	N/A N/A
	EMER ELEC CONF	3	10	2.20	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.85*
	FLAPS<1				
	S<1	3	45	2.00*	1.75*
	S≥1	3	30	1.70*	1.50*
	1≤FLAPS<2				
	S<1	3	30	1.70*	1.50*
	S≥1	3	15	1.45*	1.30*
	2≤FLAPS<3				
	S<1	3	25	1.55*	1.40*
	S≥1	3	10	1.35*	1.20*
	FLAPS = 3				
	S<1	3	25	1.55*	1.40*
	1≤S≤3	3	10	1.30*	1.20*
	S>3	3	5	1.20*	1.10*
F/CTL	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.25*	1.15*
	S>3	FULL	5	1.20*	1.10*
	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.15 1.30
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.45 1.60	1.35 1.50
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.20 1.30
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.40 1.55	1.25 1.35
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.30*	1.20*



*Continued from the previous page*

WET RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				WET WITHOUT REV <sup>(c)</sup>	WET WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.30 1.45	1.25 1.40
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.05 1.15
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.15 1.30
	GREEN + BLUE	3	25	1.95	1.80
	GREEN + YELLOW	3	30	2.05	N/A
	BLUE + YELLOW	3	10	1.80	1.70
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.25 1.35	1.15 1.25
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.20
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.25
NAV	IR 1+2+3 FAULT	3	10	1.75	1.75
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	16	1.35*	1.25*
	DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT	3	10	1.30*	1.20*
BLEED	DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.30*	1.75* 1.25*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.25 1.35	1.15 1.25


<sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL

<sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.

<sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.

<sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

<sup>(e)</sup> Multiply the LDG DIST factors by the Actual Landing Distance WET without Autobrake - configuration FULL - without any reversers correction. Refer to the Landing Distance table without Autobrake (CONF FULL)

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<b>LDG CONF/APPR SPD/LDG DIST TABLE - CONTA RWY</b>
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CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
ELEC	AC BUS 1 <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC BUS 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	DC ESS BUS <sup>(b)</sup> if there is no ice accretion	FULL 3	- 6	1.10 1.20	1.05 1.15
	DC ESS BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.35	1.15 1.25
	DC ESS SHED BUS <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
	DC EMER CONF <sup>(b)</sup>	FULL 3	- 6	1.90 1.95	1.90 1.95
	DC BUS 1 + 2 <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	N/A N/A
	EMER ELEC CONF	3	10	1.95	N/A
S/F	FLAPS and SLATS at zero				
		1	60 (APPR) 50 (THRESHOLD)	2.10*	1.75*
	FLAPS < 1				
	S<1	3	45	2.00*	1.65*
	S≥1	3	30	1.70*	1.40*
	1≤FLAPS<2				
	S<1	3	30	1.60*	1.35*
	S≥1	3	15	1.40*	1.20*
	2≤FLAPS<3				
	S<1	3	25	1.50*	1.30*
	S≥1	3	10	1.30*	1.10*
	FLAPS=3				
	S<1	3	25	1.45*	1.25*
	1≤S≤3	3	10	1.25*	1.05*
	S>3	3	5	1.15*	1.00*
	FLAPS>3				
	S<1	NOT ALLOWED			
	1≤S≤3	FULL	10	1.20*	1.05*
	S>3	FULL	5	1.10*	1.00*
F/CTL	ONE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.15 1.25	1.00 1.10
	TWO SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	THREE SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.20
	ALL SPLR FAULT / GND SPLR FAULT <sup>(b)</sup>	FULL 3	- 6	1.55 1.75	1.55 1.75
	SEC 1 or SEC 3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	SEC 2+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.05 1.15
	SEC 1+3 FAULT <sup>(b)</sup>	FULL 3	- 6	1.40 1.60	1.30 1.45
	SEC 1+2 FAULT <sup>(b)</sup>	FULL 3	- 6	1.25 1.35	1.15 1.25
	RUDDER JAM <sup>(b)</sup>	FULL 3	- 6	1.20 1.35	1.05 1.15
	SEC 1+2+3 FAULT	3	10	1.85	N/A
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.25*	1.05*



*Continued from the previous page*

CONTAMINATED RUNWAYS					
SYS	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	LDG DIST Factors <sup>(a)</sup>	
				CONTA WITHOUT REV <sup>(c)</sup>	CONTA WITH REV
HYD	GREEN <sup>(b)</sup>	FULL 3	- 6	1.25 1.40	1.15 1.30
	BLUE <sup>(b)</sup>	FULL 3	- 6	1.10 1.20	1.00 1.05
	YELLOW <sup>(b)</sup>	FULL 3	- 6	1.15 1.30	1.10 1.20
	GREEN+BLUE	3	25	1.80	1.65
	GREEN + YELLOW	3	30	2.00	N/A
	BLUE + YELLOW	3	10	1.75	1.55
A.ICE	WING ANTI ICE SYS FAULT <sup>(b)</sup> if there is ice accretion	FULL 3	10 16	1.20 1.30	1.05 1.15
BRK	ANTI SKID <sup>(b)</sup>	FULL 3	- 6	1.05 1.20	1.00 1.05
	AUTO BRK FAULT <sup>(b)</sup>	FULL 3	- 6	1.20 1.30	1.10 1.20
NAV	IR 1+2+3 FAULT	3	10	1.35	1.35
	UNRELIABLE SPEED INDICATION/ADR CHECK PROC	3	16	1.30*	1.15*
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.25*	1.05*
BLEED	DUAL BLEED FAULT / WING or ENG BLEED LEAK /X BLEED FAULT / ENG BLEED LO TEMP and if ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15
ENG	REV UNLOCK with buffet <sup>(d)</sup>	1 3	55 (APPR) 40 (THRESHOLD) 10	1.85* 1.25*	1.70* 1.15*
	SHUTDOWN with ENG FIRE pb pushed and ice accretion <sup>(b)</sup>	FULL 3	10 16	1.20 1.30	1.05 1.15

- <sup>(a)</sup> Multiply the LDG DIST factors by the Actual Landing Distance CONTA without Autobrake - configuration FULL - without any reversers correction. Refer to FPE-IFL Landing Distance Without AUTOBRAKE - CONF FULL
- <sup>(b)</sup> Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew may use Flaps 3, if necessary, for operational reasons.
- <sup>(c)</sup> In case of dispatch with one or more reverser(s) inoperative, use the LDG DIST factors "WITHOUT REV.", whatever the actual thrust reversers selection at landing.
- <sup>(d)</sup> The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.


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<b>TRIPPED C/B RE-ENGAGEMENT</b>
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In flight, do not reengage a circuit breaker (C/B) that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted.

On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.



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<b>COMPUTER RESET</b>
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When a digital computer behaves abnormally, as a result of an electrical transient, for example, the Operator can stop the abnormal behavior by briefly interrupting the power supply to its processor. The flight crew can reset most of the computers in this aircraft with a normal cockpit control (selector or pushbutton). However, for some systems, the only way to cut off electrical power is to pull the associated circuit breaker.

To perform a computer reset:

- Select the related normal cockpit control OFF, or pull the corresponding circuit breaker.
- Wait 3 s if a normal cockpit control is used, or 5 s if a circuit breaker is used (unless a different time is indicated)
- Select the related normal cockpit control ON, or push the corresponding circuit breaker
- Wait 3 s for the end of the reset.

<b>WARNING</b>	Do not reset more than one computer at the same time, unless instructed to do so.
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Note: In flight, before taking any action on the cockpit C/Bs, both the PF and PNF must :

- Consider and fully understand the consequences of taking action
- Crosscheck and ensure that the C/B label corresponds to the affected system.


The computers most prone to reset are listed in the table below, along with the associated reset procedure. Specific reset procedures included in OEB or TDUs are not referenced in this table and, when issued, supersede this table.

- On ground, almost all computers can be reset and are not limited to the ones indicated in the table.

The following computers are not allowed to be reset in specific circumstances:



- ECU (Engine Control Unit on CFM engines), or EEC (Electronic Engine Control on IAE engines), and EIU (Engine Interface Unit) while the engine is running.
- BSCU (Brake Steering Control Unit), if the aircraft is not stopped.
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TDUs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

<b>CAUTION</b>	Do not pull the following circuit breakers: <ul style="list-style-type: none"> <li>- SFCC (could lead to SLATS/FLAPS locked).</li> <li>- ECU or EEC, EIU.</li> </ul>
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<b>COMPUTER RESET TABLE</b>				
ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset	
21	<u>VENT AVNCS</u> SYS FAULT	AEVC	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B Y 17 on 122VU</li><li>- Wait 1 s before pushing the C/B.</li></ul>	
22	<u>AUTO FLT</u> FCU 1(2) FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, or M21 on 121VU for FCU2.</li><li>- Push it after 5 s.</li><li>- If FCU1(2) FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU1(2) FAULT remains, pull both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul>	
22	<u>AUTO FLT</u> FCU 1+2 FAULT	FCU	<b>In flight:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s.</li><li>- CHECK the displayed targets and the barometer reference, and correct them if necessary.</li></ul> <b>On ground:</b> <ul style="list-style-type: none"><li>- Pull the C/B B05 on 49VU for FCU1, and then M21 on 121VU for FCU2.</li><li>- Push them after 5 s</li><li>- If FCU 1+2 FAULT disappears, CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li><li>- If FCU 1+2 FAULT remains, pull again both C/B B05 on 49VU and M21 on 121VU</li><li>- Push them after 7 min, with a delay of less than 5 s between side 1 and 2</li><li>- Wait for at least 30 s for FCU1 and FCU2 safety tests completion</li><li>- CHECK the displayed targets and barometer reference, and correct them if necessary (RESET successful)</li></ul> <p>FCU targets are synchronized on current aircraft values, and displayed as selected targets.</p> <ul style="list-style-type: none"><li>- RE-ENTER the barometer altimeter setting value, if necessary.</li></ul>	




*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
22	WINDSHEAR DET FAULT or REAC W/S DET FAULT 	FAC 1+2	<b>On ground only:</b> The Flight Crew could cancel these alerts by resetting both FACs, one after the other <ul style="list-style-type: none"> <li>- Pull the C/Bs B03 and B04 on 49VU and push them after 5 s</li> <li>- Pull the C/Bs M18 and M19 on 121VU and push them after 5 s</li> </ul>
	One MCDU locked, or blank	MCDU	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the CB for the locked or blank MCDU and push it back after 10 s. The circuit breakers for the MCDU's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/MCDU 1 B1 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/MCDU 2 N20 ON 121 VU (Right Rear Maintenance Panel)</li> <li>• AUTO FLT/MCDU 3 N21 ON 121 VU (Right Rear Maintenance Panel) </li> </ul> </li> </ul>
	Both MCDU locked, or blank FMGC malfunction	FMGC  FMGC	<b>On ground:</b> <ul style="list-style-type: none"> <li>- Apply external power or APU generator power</li> <li>- Wait 2 min before resetting the FMGC circuit breakers</li> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div> <b>In flight:</b> <ul style="list-style-type: none"> <li>- FD 1(or 2) (OFF)</li> <li>- Pull the CB of the affected FMGC and reset it after 5 s. The circuit breakers for the FMGC's are:               <ul style="list-style-type: none"> <li>• AUTO FLT/FMGC 1 B2 ON 49 VU (Overhead Panel)</li> <li>• AUTO FLT/FMGC 2 M17 ON 121 VU (Right Rear Maintenance Panel)</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CAUTION</b> Always wait 1 min after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.         </div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
23	COM CIDS 1+2 FAULT	CIDS	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull the C/Bs in the following order: G01 on 49VU, M06 on 121VU. G02 on 49VU, M07 on 121VU.</li> <li>- Wait 10 s, then</li> <li>- Push the C/B in the following order: M06, M07, G01, G02.</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul>
	Uncommanded EVAC horn activation	CIDS	<b>On ground, or in flight:</b> Press the EVAC HORN SHUT OFF pb. Set the EVAC CAPT & PURS CAPT sw to the CAPT only position. Wait for 3 s. <ul style="list-style-type: none"> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR2 in the following order: G02 on 49VU, M07 on 121VU.</li> </ul> </li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the C/Bs for DIR1 in the following order: G01 on 49VU, M06 on 121VU.</li> <li>- Wait for 1 min, then:</li> <li>- Push the C/Bs for DIR2 in the following order: M07, G02</li> <li>- After CIDS reset, wait approximately 4 min, before recovering normal operation.</li> </ul> </li> </ul>
23	Frozen RMP	RMP	<b>On ground, or in flight:</b> The flight crew must reset all the RMPs one after the other via the RMP control panel: <ul style="list-style-type: none"> <li>- Set RMP ON/OFF sw to OFF position,</li> <li>- Wait 5 s,</li> <li>- Set RMP ON/OFF sw to ON position.</li> </ul>
	FAP freezing	FAP or Tape reproducer PRAM	<b>On ground, or in flight:</b> <ul style="list-style-type: none"> <li>- Pull C/B M14 (or Q14 ) of the FAP* in the 121VU.</li> <li>- Wait 10 s before pushing the C/B.</li> <li>• IF UNSUCCESSFUL:               <ul style="list-style-type: none"> <li>- Pull the tape reproducer/PRAM C/B F07 on 2000VU (cabin)</li> <li>- Wait 10 s before pushing the C/B.</li> </ul> </li> </ul>
26	SMOKE DET FAULT	SDCU	<b>On ground only:</b> <ul style="list-style-type: none"> <li>- Pull C/B C06 on 49VU, and C/B T18 on 122VU.</li> <li>- Wait 60 s before pushing both C/Bs.</li> </ul>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
27	F/CTL ELAC 1(2) FAULT (one or both computer failed)	ELAC	<div><div><b>On ground, or in flight</b><ul style="list-style-type: none"><li>- Set ELAC 1(2) pb to OFF</li><li>- Wait 3 s,</li><li>- Set ELAC 1(2) pb to ON</li></ul></div><div><div><b>CAUTION</b></div><div>Do not reset ELAC, if uncommanded maneuvers occurred during flight.</div></div><div><i>Note:</i> If both ELACs are failed, reset one ELAC after the other.</div></div>
	F/CTL SPLR FAULT triggered on ground after the flight control check.	SEC	<div><div><b>WARNING</b></div><div>Do not reset more than one computer at a time.</div></div> <div><i>Note:</i> If a reset is performed, the flight crew must then perform a flight controls check.</div>
	ELAC or SEC malfunction	ELAC or SEC	<div><div><b>WARNING</b></div><div><div>Do not reset more than one computer at a time.</div><div><ul style="list-style-type: none"><li>- It is possible to reset the flight control computers in flight, even if not requested by the ECAM, provided only one reset is performed at a time: For the ELAC only, in case of uncommanded maneuvers during the flight, the reset is not recommended.</li></ul></div></div><div><b>Note:</b><ul style="list-style-type: none"><li>- When an ELAC reset is performed on ground, the crew must check the pitch trim position.</li><li>- If a reset is performed on ground, the flight crew must then perform a flight controls check.</li></ul></div></div>
28	Loss of fuel quantity indication	FQIC	<div><div><b>On ground, or in flight:</b><ul style="list-style-type: none"><li>- Pull the C/B of the affected channel:<ul style="list-style-type: none"><li>• Channel 1 (A13 on 49VU)</li><li>• Channel 2 (M27 on 121VU)</li></ul></li><li>- Wait 5 s, before pushing the C/B.</li></ul></div><div><i>Note:</i> The fuel quantity indication will be re-established within 1 min.</div></div>
31	FWS FWC 1(2) FAULT	FWC	<div><div><b>On ground:</b> Pull, then push, the C/B of the affected FWC:<ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2.(Q7 on 121VU)</li></ul>Wait 50 s after pushing the C/Bs.</div><div><b>In flight:</b> Pull, then push, the C/B of the affected FWC:<ul style="list-style-type: none"><li>- FWC 1 (F01 on 49VU)</li><li>- FWC 2 (Q7 on 121VU)</li></ul></div></div>



*Continued from the previous page*

ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
32	BRAKES SYS 1(2) FAULT or BRAKES BSCU 1(2) FAULT	BSCU	<p><b>On ground:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- <b>If unsuccessful:</b> <ul style="list-style-type: none"> <li>- Pull C/Bs M33 and M34 on 121VU for BSCU channel 1</li> <li>- Pull C/Bs M36 and M35 on 121VU for BSCU channel 2</li> <li>- Push C/Bs</li> </ul> </li> </ul> <p>After a successful reset, continue the flight</p> <p><u>Note:</u>    After any BSCU reset :</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record BSCU reset in the logbook</li> </ol> <p><b>In Flight:</b></p> <p>Before landing gear extension:</p> <ul style="list-style-type: none"> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> <li>- If required, rearm the autobrake</li> </ul> <p><u>Note:</u>    After any BSCU reset :</p> <ul style="list-style-type: none"> <li>- Record BSCU reset in the logbook</li> </ul>
	WHEEL N.W STEER FAULT or WHEEL N/W STRG FAULT	BSCU	<p><b>On ground only:</b></p> <ul style="list-style-type: none"> <li>- STOP aircraft</li> <li>- Set PARK BRK handle to ON</li> <li>- Confirm that towing bar is disconnected</li> <li>- Set A/SKID &amp; N/W STRG sw to OFF</li> <li>- Set A/SKID &amp; N/W STRG sw to ON</li> </ul> <p>If successful go back to the gate for troubleshooting with a maximum taxi speed at 10 kt.</p> <p><u>Note:</u>    If during taxi, when the aircraft is moving, <u>WHEEL N.W STEER FAULT</u> or <u>WHEEL N/W STRG FAULT</u> ECAM alert appears along with the NW STRG DISC memo, the flight crew may attempt to perform only one BSCU reset. If the mentioned alert and memo disappear after this BSCU reset, continue the flight.</p> <p><u>Note:</u>    After any BSCU reset:</p> <ol style="list-style-type: none"> <li>1. Check brake efficiency</li> <li>2. Record the BSCU reset in the logbook</li> </ol>
	L/G LGCIU 1(2) FAULT	LGCIU 1(2)	<p><b>On ground only:</b></p> <p>The flight crew must depressurize the green hydraulic system before resetting the LGCIU.</p> <ul style="list-style-type: none"> <li>- ENG 1 PUMP: OFF</li> <li>- PTU: OFF</li> </ul> <p>When there is no green hydraulic pressure:</p> <ul style="list-style-type: none"> <li>- To reset LGCIU 1:               <ul style="list-style-type: none"> <li>• Pull C/B Q34 on 121VU, then C09 on 49VU</li> <li>• Wait for 15 s , then push the C/Bs</li> </ul> </li> <li>- To reset LGCIU 2:               <ul style="list-style-type: none"> <li>• Pull C/B Q35 on 121VU</li> <li>• Wait for 15 s , then push the C/B</li> </ul> </li> </ul>





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ATA	System malfunction or ECAM Warning/Caution	Affected System	Reset
34	NAV TCAS FAULT	TCAS	<b>On ground only:</b> <ul style="list-style-type: none"><li>- Pull C/B K10 on 121VU.</li><li>- Wait 5 s, then push the C/B.</li></ul>
38	Failure messages on the CIDS FAP in the cabin	Vacuum System Controller	<b>On ground, or in flight:</b> <ul style="list-style-type: none"><li>- Pull C/B 35 MG on 2001VU, aft cabin,</li><li>- Wait 30 s, then push the C/B 35 MG.</li></ul>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if: key selection has no effect on any of the MCDU ATSU DATALINK submenus. <b>On ground, or in flight:</b> <ul style="list-style-type: none"><li>- Pull the C/Bs in the following order: L16, L15 on 121VU</li><li>- Wait 5 s, then:</li><li>- Push the C/Bs in the following order: L15, L16.</li></ul>

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# **COMPANY PROCEDURES**

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## LOW VISIBILITY OPERATIONS (LVO)

### ● TAXI/LINE UP

Maximum speed 10 kts

Complete the Before T/O checklist before taxi or after reaching the holding point.

Use ILS to confirm the correct departure runway.

### ● DESCENT PREPARATION

Check the ECAM STATUS page for any degraded approach capability:

Refer any system fault to the table of equipment required in QRH OPS.04.

Subject to aircraft status, plan for a CAT 3 DUAL approach. Observe the following minimum requirements:

	Autoland	Auto-rollout	A/THR	Auto-callout
<b>Cat 3B</b>	Required	Required	Required	Required
<b>Cat 3A</b>	Required	Preferred	Required	Required
<b>Cat 2</b>	Preferred <sup>(1)</sup>	Preferred	Preferred	Preferred

<sup>(1)</sup> If a manual landing is required, autopilot shall be disconnected by 80ft RA.

DH	DH entry on PERF APPR page
<b>With DH</b>	Insert RA from Port Page
<b>NO DH</b>	Insert "NO"

As part of the normal arrival briefing:

- Confirm LVP (Low Visibility Procedures) in force (clearance to fly a Cat 2/3 approach satisfies this requirement).
- Review LWMO and autoland requirements on the Port Page.
- For autoland, confirm that the wind is within the autoland limits.
- State the category of approach to be flown.
- Review reversion capability.
- Review task sharing, standard calls and the actions in the event of a missed approach.

### ● APPROACH: REVERSION

For any system fault that does not incur a landing capability downgrade on ECAM STATUS or FMA, the fault shall be checked against the table of equipment required in QRH OPS.04.

If a reversion to a degraded approach capability occurs and the RVR is within limits for the approach to be continued with the new capability:

- Above 1 000 ft RA, complete ECAM actions, amend the DH in the PERF APPR page and continue the approach.
- Below 1 000 ft RA, a go-around is recommended.

If a reversion to a degraded approach capability occurs and the RVR is below the minima for the new approach capability, the approach may not commence, or continue if already below 1 000 ft RA.

Unless there are sufficient visual references, a go-around is mandatory if:

- LAND green is not annunciated by 350 ft RA.
- The AUTOLAND warning light illuminates.
- During an autoland, FLARE is not annunciated by 30 ft RA. In this case, the PM shall call "NO FLARE" and the PF shall disconnect the AP and land manually if sufficient visual reference.

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## LVO DEPARTURE

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Takeoff Alternate
- PF to taxi / max speed 10 kt / Strobes ON
- PM to navigate using taxi chart & a/c heading
- Do not cross CAT II/III holding points without clearance
- Before T/O Checklist when a/c is stationary
- Consider TOGA
- ALL RVR's at/above Takeoff minima
- Use localiser to confirm correct runway centerline

## LVO APPROACH & AUTOLAND

### ● LHS Captain is PF. During the C-TWO + briefing review:

- Confirm LVP in force
- Review Port Page LWMO & Autoland requirements
- Check STATUS for any degraded approach capability
- State category of approach and reversion capability
- Insert DH in MCDU / Review CAT I minima
- Check surface wind within limits:
  - AUTOLAND (HWC30 / TWC10 / XWC20)
  - MANUAL LAND (HWC40 / TWC10 / XWC25)
  - OEI ROLLOUT (IDLE REV ONLY XWC15)
- Check RVR's: TDZ & MID controlling / RO advisory
- Review Task sharing & Standard Calls
- PM to call "FLARE/NO FLARE" (30 ft) & "ROLLOUT/NO ROLLOUT"
- LVP taxiway to vacate runway / LVP taxi route

#### Failures below 1000AAL and in IMC, Go-Around for:

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| - α Floor                                      | - Engine Failure               |
| - Autopilot OFF                                | - No 'LAND' green by 350 ft RA |
| - Downgrade below required approach capability | - Autoland warning light       |
| - Amber Caution                                | - No "Flare" by 30 ft          |

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## RNAV (GNSS) / RNAV (RNP) APPROACH

### ● APPROACH PREPARATION

Database waypoints from the final approach course fix to the runway threshold or MAP shall not be modified.

Refer to OEB Index and the AML to determine if restrictions on the use of FINAL APP mode apply.

Prior to the approach, check:

- Two operative navigation systems (2 x FMGS and 2 x GPS).
- Both GPSs in NAV on the GPS MONITOR page.
- GPS PRIMARY on both MCDUs.

The aircraft shall be laterally stable by the FAF.

### ● APPROACH GUIDANCE

FINAL APP (recommended) and NAV-FPA modes are available:

- FINAL APP mode shall be used for approach to a decision altitude (DA).
- NAV-FPA may be used for approach to a minimum descent altitude (MDA), and shall be used for approach when OAT is below the published Baro-NAV minimum temperature, or if low temperature altitude corrections are applied for the approach. Part A chapter 8 refers.

### ● AFTER COMMENCING APPROACH: NAVIGATION ALERTS

GPS FAULT 1(2) ECAM caution:

- Continue the approach.

GPS PRIMARY LOST displayed:

- On one ND, continue using the AP/FD associated with the other ND/FMGS.
- On Both NDs:
  - Standalone approach: discontinue the approach.
  - Overlay approach: continue the approach using navaid raw data. If necessary, revert to NAV-FPA or TRK-FPA.

FM/GPS POS DISAGREE ECAM caution:

- Standalone approach: discontinue the approach.
- Overlay approach: revert to TRK-FPA and continue the approach using navaid raw data.

FMS1/FMS2 POS DIFF message on the MCDU scratchpad:

- Standalone approach: discontinue the approach.
- Overlay approach: continue the approach using navaid raw data and the AP/FD associated with the accurate (non-affected) FMGS. If necessary, revert to TRK-FPA.

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COLD WEATHER / DE-ICING - FLIGHT PREPARATION

- **REVIEW**
  - ATIS - W/V (Crosswind), Precipitation, Visibility (snowfall intensity table - Part A Chapter 8). If freezing fog, note previous taxi-in time.
  - The available or desireable type or De-icing/Anti-icing fluid(s) and respective mixture ratio.
  - The location and method of de-icing, the supplier and KA priority.
  - Runway surface and braking conditions (Friction Index).
  - Length of expected or occuring delays.
  - Aircraft PADDs - if APU inop, GPU required at Remote Bay de-icing (with engines shutdown).
- **DETERMINE**
  - Holdover Time (HOT) using appropriate table from Part A Chapter 8 and current or expected weather conditions.
  - Max RTOW and Max Crosswind - in current and expected weather conditions - Refer to PRO-SUP-91-50 Fluid Contaminated Runway.
  - Fuel Required - with possible lengthy taxi delays. No fuel tankering required.
  - Max ZFW and, if limiting, advise Load Control.
  - Takeoff alternate (as necessary) within 340 nm.
- **CONFIRM**
  - Slot time (if any).
  - Boarding time (allowing for possible LMCs).
  - If de-icing at the gate - the scheduled sequence/time.
  - If possible - ensure vacant cabin seats available for the Pre-takeoff Contamination Inspection (PCI).

COLD WEATHER / DE-ICING - COCKPIT PREPARATION

- **SYSTEMS IN COLD WEATHER (REFER TO PRO-SUP-91-30)**

IRS..... Align early (15 mins)

Pack 1 (then 2)..... ON

*Note: (If the pack outlet temperature indication on ECAM is crossed amber, the associated pack controller has to be reset to ensure pack overheat protection and to recover pack outlet temperature indication.)*

Probe/Window Heat.....ON, prior to external inspection
- **PERFORMANCE**
  - Takeoff: Engine and/or Wing Anti-ice, Optimal Flap setting.
  - Cold Weather Altimetry.
  - Landing Distance: for possible immediate return.
- **BRIEFING**
  - Tyre flat spots may cause nose wheel vibration on takeoff.
  - Taxi-route (LVP) and speeds.
  - Review fan ice shedding procedures. Refer to PRO-NOR-SOP-09.
  - Review Ground De-icing procedures. Refer to PRO-SUP-91-30.
- **PA**
  - Include the operational requirements to de-ice to inform and re-assure passengers.

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## DE-ICING AND ANTI-ICING PROCEDURES

De-icing and Anti-icing Procedures Part A 8.2.3 & PRO-SUP-91-30	
Remote De-icing Bay (engines shutdown)	De-icing at terminal gate
<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li></ul>	
<b>After Start</b> <ul style="list-style-type: none"><li>Engine oil pressure may be unusually high after start until oil temperature stabilizes.</li><li>Keep APU ON.</li><li>Do not move flaps or trims.</li></ul>	
<b>At Remote Bay</b> <ul style="list-style-type: none"><li>Taxi-Lights - OFF</li><li>Engines - Shutdown</li><li>Shutdown Checklist - Complete</li></ul>	
<b>Procedure for Ground De-icing / Anti-icing (Refer to PRO-SUP-91-30) ..... apply</b> <ul style="list-style-type: none"><li>Note Start Time of Final Fluid application.</li><li>Add HOT.</li><li>Calculate expiry of HOT.</li></ul> <p>If only one De-icing truck used: Note first wing to receive treatment, as fluid is likely to fail on this wing first.</p>	
Re-evaluate ATIS, HOT, FOB, C-TWO+ Briefing <ul style="list-style-type: none"><li>Before start checklist.</li><li>Init B: re-enter ZFWCG/ZFW.</li><li>Check T.O PERF.</li><li>Flap Retraction Brief.</li></ul>	
Start Checklist ..... Complete	
<b>Note:</b> If ZFWCG/ZFW is not entered prior to start, ECAM message FUEL NO WEIGHT/CG DATA will require the entry of <b>Gross Weight</b> GW/CG on FUEL PRED page.	<b>Pushback</b> <ul style="list-style-type: none"><li>Consider starting the engines after pushback if ramp is contaminated.</li><li>Engine Oil Pressure may be unusually high after start until oil temperature stabilizes.</li></ul>
Probe/Window Heat ..... AUTO	
Further Considerations If taxi in slush/standing water - leave flaps up until holding point LVP Procedures Wing Anti-icing Operations: Select and Leave ON - Do not interrupt the 30 SEC test sequence	
Fan Ice Shedding	
Fan Ice Shedding: OAT <3 °C → 50 % N1 every 15 min and just prior to takeoff	
<u>Note:</u> When performing the static run-up, the 61-74 % N1 range should be avoided.	
A Pre Takeoff Contamination Inspection / Check, as appropriate, shall be carried out if the lower time in the HOT cell has been exceeded. Part A Chapter 8.2.3 refers.	
BEFORE TAKEOFF Checklist	

## CONTAMINATED RUNWAY OPERATIONS

### ● TAKEOFF

Use TOGA thrust. FLEX thrust may ONLY be used if the equivalent condition is WET.

Do NOT takeoff from an ICY runway, or contaminated runway if:

- the friction coefficient is at or less than 0.25 ICAO, or 25 USA. Part A Chapter 8.2.3 refers.
- the contamination is greater than:
  - 12.7 mm(1/2 in) of SLUSH,
  - 25.4 mm(1 in) of WET SNOW,
  - 101.6 mm(4 in) of DRY SNOW.

ACARS RTOW sets an OAT RANGE for each condition to provide a performance buffer and protect against entry errors. Entered temperatures outside of the acceptable range will NOT produce any RTOW data.

Equivalency: For types or depths of contaminants not listed above, use the following guidelines:

CONTAMINANT	DEPTH OF CONTAMINANT	EQUIVALENT TO	ACARS CODE	OAT RANGE*
WATER	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm WATER	WT6	0 to 51 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm WATER	WT12	
SLUSH	≤ 3 mm	WET	WET (W)	-5 to 51 °C
	>3 mm and ≤ 6.3 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>6.3 mm and ≤ 12.7 mm	12.7 mm SLUSH	SH12	
WET SNOW	≤ 4 mm	WET	WET (W)	-5 to 51 °C
	>4 mm and ≤ 12.7 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>12.7 mm and ≤ 25.4 mm	12.7 mm SLUSH	SH12	
DRY SNOW	≤ 15 mm	WET	WET (W)	-5 to 51 °C
	>15 mm and ≤ 50.8 mm	6.3 mm SLUSH	SH6	-5 to 15 °C
	>50.8 mm and ≤ 101.6 mm (MAX)	12.7 mm SLUSH	SH12	-5 to 15 °C
COMPACTED SNOW	--	COMPACTED SNOW	CSNW	-54 to 5 °C

*\*Where actual OAT is below the OAT Range, use the lower limit of the OAT Range. If actual OAT is above the upper limit of the OAT Range, takeoff is NOT permitted. Re-evaluate the existing contaminant condition.*

### ● MAXIMUM CROSSWIND FOR TAKEOFF AND LANDING

Reported braking action	Reported runway friction coefficient	Maximum crosswind (kt)		Equivalent runway condition*
		Takeoff	Landing	
Good (on a wet runway)	≥ 0.4	29	33	1
Good/Medium	0.39 to 0.36	29	29	1
Medium	0.35 to 0.3	25		2/3
Medium/poor	0.29 to 0.26	20		2/3
Poor	≤ 0.25	15		3/4
Unreliable		5		4/5

\* Equivalent runway condition (only valid for maximum crosswind determination)

1. Damp or wet runway (less than 3 mm water depth)
2. Runway covered with slush
3. Runway covered with dry snow
4. Runway covered with standing water with risk of hydroplaning or wet snow
5. Ice runway or high risk of hydroplaning

Note: The maximum crosswind values are given without gust.

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LOW TEMPERATURE ALTIMETRY

Part A chapter 8 refers.

When temperature at the aerodrome is below the ISA value, it is the responsibility of the Commander to consider the effect of temperature on the minimum and reference altitudes. If corrections are to be made, the guidelines below shall be used.

- **CORRECTIONS TO MSA**
  
- **CORRECTIONS TO ALTITUDES BELOW MSA**

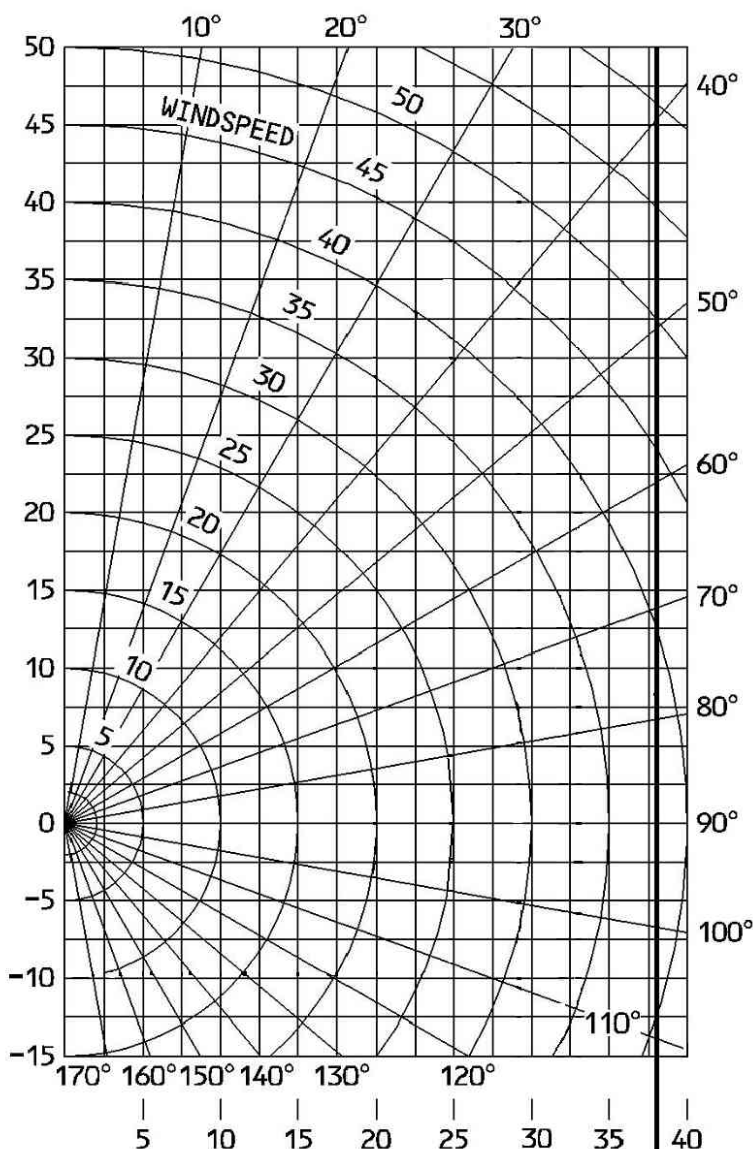
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## WIND COMPONENT CHART - A321



**Weather LIMITS:**

SO 1000' / 3000m 10 knots x-wind  
JFO 500' / 2000m 15 knots x-wind  
FO ≥ CAT I 20 knots x-wind

CAT II Autoland  
30 knots headwind  
20 knots x-wind  
10 knots tailwind  
15 knot x-wind limit  
for OEI Rollout with  
IDLE reverse only.

CAT II No Autoland  
40 knots headwind  
25 knots x-wind  
10 knots tailwind

Take-Off  
& Gust

Landing  
& Gust

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## ACARS LANDING FAIL CODE - A321

SYS	FAILURE		CODE	SYS	FAILURE		CODE	
ELEC	AC BUS 1		01	HYD	GREEN		01	
	DC BUS 2		02		BLUE		02	
	DC ESS BUS if there is no ice accretion		03		YELLOW		03	
	DC ESS BUS if there is ice accretion		04		GREEN + BLUE		04	
	DC ESS SHED BUS if there is ice accretion		05		GREEN + YELLOW		05	
	DC EMER CONFIG		06		BLUE + YELLOW		06	
	DC BUS 1+2		07	A. ICE	WING ANTI ICE SYS FAULT if there is ice accretion		01	
	EMER ELEC CONFIG		08					
S/F	FLAPS and SLATS at zero		01	BRK	ANTI SKID		01	
	FLAPS < 1	S < 1	02		AUTO BRK FAULT		02	
			S ≥ 1	03	NAV	IR 1+2+3 FAULT		01
	1 ≤ FLAPS < 2	S < 1	04	UNRELIABLE SPEED INDICATION/ADR CHECK PROC		02		
			S ≥ 1	05		DUAL IR FAULT/DUAL ADR FAULT/ADR 1+2+3 FAULT		03
	2 ≤ FLAPS < 3	S < 1	06	BLEED		DUAL BLEED FAULT/WING or ENG BLEED LEAK/X BLEED FAULT/ENG BLEED LO TEMP and if ice accretion		01
			S ≥ 1		07			
	FLAP = 3	S < 1	08		ENG	REV UNLOCK with buffet (CONF 1)		01
		1 ≤ S ≤ 3	09			REV UNLOCK with buffet (CONF 3)		02
		S > 3	10	SHUTDOWN with ENG FIRE pb pushed and ice accretion		03		
		FLAP > 3	S < 1	11				
			1 ≤ S ≤ 3	12				
			S > 3	13				
F/CTL	ONE SPLR FAULT		01					
	TWO SPLR FAULT		02					
	THREE SPLR FAULT		03					
	ALL SPLR FAULT/GND SPLR FAULT		04					
	SEC 1 or SEC 3 FAULT		05					
	SEC 2 FAULT		06					
	SEC 2 + 3 FAULT		07					
	SEC 1 + 3 FAULT		08					
	SEC 1 + 2 FAULT		09					
	RUDDER JAM		10					
	SEC 1 + 2 + 3 FAULT		11					
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM		12					

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**SPEEDS**

OPERATING SPEEDS (KT)					
W (1000 KG)	F	S	Green dot FL < 200 <sup>(1)</sup>	VLS CONF 3	VREF
52	130	168	188	121	116
56	135	174	194	125	121
60	140	180	200	130	125
64	144	186	206	134	129
68	149	192	212	138	133
72	153	197	218	142	137
76	157	203	224	146	141
80	161	208	230	150	144
84	165	213	236	154	148
88	169	218	242	157	151
92	173	223	248	161	155
94	175	226	251	163	157

<sup>(1)</sup> Above FL 200 add 1 kt per additional 1 000 ft.

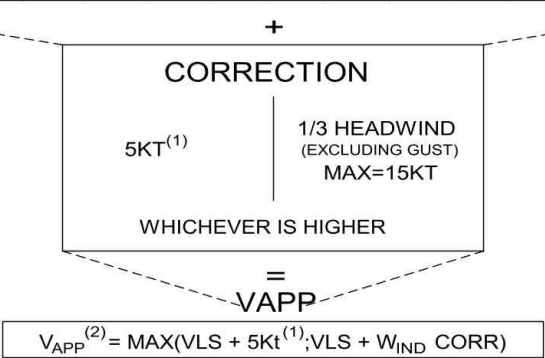
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## VAPP DETERMINATION

The FMGS performs the following VAPP computation for landing in normal configuration (CONF 3 or CONF FULL).

W(1000Kg)	52	56	60	64	68	72	76	80	84	88	92	94
VLS CONF FULL (KT)	116	121	125	129	133	137	141	144	148	151	155	157
VLS CONF 3 (KT)	121	125	130	134	138	142	146	150	154	157	161	163



1. The 5 kt increment is required when the A/THR is used, or when an autoland is performed.
  2. In case of ice accretion, Vapp must not be lower than:
    - VLS + 5 kt in CONF FULL
    - VLS + 10 kt in CONF 3
- In case of strong or gusty crosswind greater than 20 kt, Vapp should be at least VLS + 5 kt. The 5 kt increment above VLS may be increased up to 15 kt at the flight crew's discretion.

LANDING DISTANCE WITHOUT AUTOBRAKE - CONF 3

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		860	900	940	980	1020	1070	1150	1370	1470	1570
	WET		1110	1180	1250	1330	1400	1470	1540	1670	1770	1860
	COVERED WITH	STANDING WATER	1550	1660	1760	1880	1990	2080	2200	2310	2420	2520
		SLUSH	1490	1580	1670	1770	1870	1980	2070	2170	2280	2370
		COMPACTED SNOW	1390	1460	1530	1600	1670	1730	1790	1850	1920	1980
		ICE	2780	2910	3050	3190	3310	3440	3560	3700	3830	3950

CORRECTION ON ACTUAL LANDING DISTANCE						
RUNWAY CONDITION	dry runway	wet runway	runway covered with			
			standing water	slush	compacted snow	ice
per 1 000 ft above SL	+3 %	+4 %	+4 %	+5 %	+4 %	+5 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed					
per 10 kt tailwind	+16 %	+21 %	+22 %	+21 %	+16 %	+26 %
2 reversers operative	-5 %	-8 %	-17 %	-16 %	-11 %	-29 %
Per 5 kt speed increment (and no failure) add 8 % (all runways)						

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW = 74 000 kg  
Pressure altitude = 2 000 ft  
Approach speed = VLS + 5 kt  
Dry runway

Read from ALD table,  
ALD (0 ft, No wind, VLS, no reversers) = 1 020 m

Read from the Corrections table,  
Pressure altitude correction: 3 × 2 = +6 %  
Speed increment correction: +8 %

ALD (2 000 ft, No wind, VLS + 5 kt no reversers) = 1020 × 1.06 × 1.08 = 1 170 m.

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-IFL</b> <b>3/4</b>
		30 MAR 12

**LANDING DISTANCE WITHOUT AUTOBRAKE - CONF FULL**

The actual landing distance is the distance to come to a complete stop from a point 50 ft above the landing surface. No margin is included in this distance.

ACTUAL LANDING DISTANCE (METERS)												
WEIGHT (1000 KG)			58	62	66	70	74	78	82	86	90	94
RUNWAY CONDITION	DRY		820	850	890	930	970	1020	1080	1290	1380	1470
	WET		1040	1100	1160	1230	1290	1360	1430	1540	1640	1720
	COVERED WITH	STANDING WATER	1430	1530	1640	1740	1840	1940	2030	2140	2240	2340
		SLUSH	1390	1470	1560	1640	1730	1820	1920	2020	2120	2210
		COMPACTED SNOW	1310	1380	1440	1510	1570	1630	1680	1750	1810	1860
		ICE	2590	2720	2850	2970	3090	3210	3320	3450	3580	3690
CORRECTION ON ACTUAL LANDING DISTANCE												
RUNWAY CONDITION	dry runway	wet runway	runway covered with									
			standing water	slush		compacted snow		ice				
per 1 000 ft above SL	+3 %	+4 %	+4 %		+5 %		+4 %		+4 %			
per 10 kt headwind	No correction for headwind due to wind correction on approach speed											
per 10 kt tailwind	+16 %	+21 %	+24 %		+22 %		+16 %		+27 %			
2 reversers operative	-4 %	-8 %	-16 %		-15 %		-11 %		-28 %			
Per 5 kt speed increment (and no failure) add 8 % (all runways)												

*Note:* - THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

**EXAMPLE:** Actual Landing Distance (ALD) calculation with multiple corrections

Data: LW =74 000 kg  
 Pressure altitude = 2 000 ft  
 Approach speed = VLS + 5 kt  
 Dry runway

Read from ALD table,  
 ALD (0 ft , No wind, VLS, no reversers) = 970 m

Read from the Corrections table,  
 Pressure altitude correction: 3 × 2 = +6 %  
 Speed increment correction : +8 %

ALD (2 000 ft, No wind, VLS + 5 kt, no reversers) = 970 × 1.06 × 1.08 = 1 120 m.

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF 3

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		MODE	54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAILWIND	PER 10 KT HEADWIND
RUNWAY CONDITION												
DRY		MED LOW	1340 1920	1440 2100	1550 2290	1650 2460	1810 2640	1970 2810	+5 +3	0 0	+13 +15	-2 -2
WET		MED LOW	1410 1920	1540 2100	1690 2290	1830 2460	2010 2640	2200 2810	+6 +3	-3 0	+17 +15	-3 -2
COVERED WITH	STANDING WATER	MED LOW	1770 1900	1990 2090	2210 2300	2410 2490	2640 2720	2860 2940	+6 +4	-17 0	+21 +18	-4 -2
	SLUSH	MED LOW	1700 1860	1890 2030	2100 2220	2290 2400	2490 2590	2690 2790	+7 +5	-16 0	+21 +17	-3 -2
	COMPACTED SNOW	MED LOW	1580 1870	1700 2050	1830 2230	1940 2390	2060 2560	2170 2730	+6 +4	-12 0	+15 +15	-2 -2
	ICE	MED	2980	3240	3530	3780	4040	4290	+6	-29	+25	-4
		LOW	3000	3260	3550	3800	4060	4320	+5	-26	+26	-4

Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).

AUTOLAND LANDING DISTANCE  
WITH AUTOBRAKE - CONF FULL

ACTUAL LANDING DISTANCE (METERS)								CORRECTIONS (%) ON LANDING DISTANCE				
WEIGHT (1000 KG)		54	62	70	78	86	94	PER 1000 FT ABOVE SL	2 REV. OP.	PER 10 KT TAIL WIND	PER 10 KT HEAD WIND	
RUNWAY CONDITION	MODE											
DRY		MED LOW	1280 1830	1370 1990	1460 2150	1530 2300	1660 2450	1800 2590	+3 +3	0 0	+13 +14	-1 -2
WET		MED LOW	1330 1830	1440 1990	1560 2150	1670 2300	1820 2450	1980 2590	+4 +3	-2 0	+16 +14	-2 -2
COVERED WITH	STANDING WATER	MED LOW	1660 1810	1830 1980	2020 2150	2190 2310	2400 2490	2580 2660	+4 +4	-16 0	+20 +18	-3 -2
		SLUSH	MED LOW	1590 1770	1760 1930	1940 2080	2080 2220	2270 2380	2440 2540	+5 +5	-16 0	+20 +16
	COMPACTED SNOW		MED LOW	1500 1780	1600 1940	1710 2090	1800 2230	1890 2380	1970 2520	+4 +4	-11 0	+14 +14
		ICE	MED LOW	2790 2810	3030 3050	3270 3290	3490 3510	3720 3740	3940 3960	+5 +5	-28 -26	+25 +26

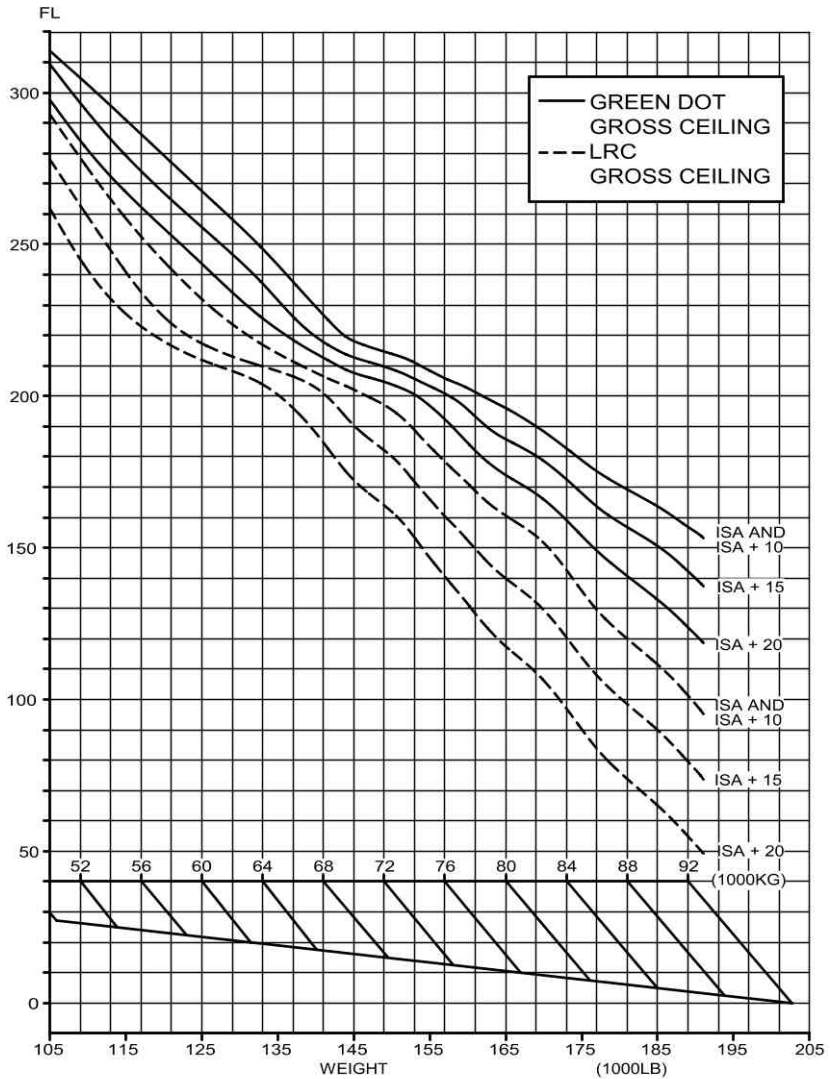
Note: - MAX MODE IS NOT RECOMMENDED AT LANDING  
- THE TABLES TAKE INTO ACCOUNT THE APPROACH SPEED INCREMENT LINKED TO HEADWIND AND AUTOLAND. FOR ANY EXTRA SPEED INCREMENT OF 5 kt (AND NO FAILURE) INCREASE LANDING DISTANCE BY 6 % (ALL RUNWAYS).



## CEILINGS

### ONE ENGINE OUT

GROSS CEILING at LONG RANGE and GREEN DOT SPEEDS Pack Flow Hi - Anti ice OFF



CORRECTIONS		ISA	ISA + 10	ISA + 15	ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	-1 300 ft	-1 300 ft	-1 400 ft	-1 400 ft
	TOTAL ANTI ICE ON	-2 800 ft	-2 800 ft	-2 800 ft	-3 000 ft
GREEN DOT	ENGINE ANTI ICE ON	-1 000 ft	-1 000 ft	-1 100 ft	-1 200 ft
	TOTAL ANTI ICE ON	-2 100 ft	-2 100 ft	-2 300 ft	-2 500 ft

Note: For weights 85 000 kg or 187 400 lb, one engine ceilings at Long Range speed may be overestimated by FMS Legacy. In this case, ceiling values provided in the above graph should be retained.

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>2/4</b> 30 MAR 12

## GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED

### ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT								
MAX. CONTINUOUS THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		DISTANCE (NM) INITIAL SPEED (KT)		TIME (MIN) FUEL(1000KG) LEVEL OFF (FT)	
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL							
	250	290	310	330	350	370	390	
50				174 32 198 .9 31700	228 42 200 1.1 31800	262 47 202 1.3 31900	288 52 204 1.3 31900	
54			156 29 202 .9 30100	222 41 204 1.2 30200	258 47 206 1.4 30300	285 52 208 1.5 30300	308 55 210 1.5 30400	
58		152 29 206 .9 28200	231 43 208 1.3 28500	269 50 210 1.5 28600	298 54 212 1.7 28600	320 58 214 1.7 28700	339 61 216 1.8 28700	
62		236 45 212 1.5 26400	279 52 214 1.7 26600	309 57 216 1.8 26600	333 61 218 1.9 26700	352 64 220 2.0 26700	369 67 222 2.1 26800	
66	155 30 214 1.1 24200	281 53 218 1.8 24600	314 59 220 2.0 24600	339 63 222 2.1 24700	360 67 224 2.2 24700	378 69 226 2.3 24800	393 71 228 2.3 24800	
70	231 45 220 1.7 22600	311 59 224 2.1 22800	335 63 226 2.2 22800	357 67 228 2.3 22900	376 70 230 2.4 22900	392 72 232 2.5 22900	406 74 234 2.5 23000	
74	214 41 226 1.6 21300	278 53 230 2.0 21400	301 56 232 2.1 21400	321 60 234 2.2 21500	339 62 236 2.2 21500	354 65 238 2.3 21500		
78	212 40 232 1.6 20500	264 49 236 1.9 20600	283 52 238 2.0 20600	301 55 240 2.1 20600	316 57 242 2.2 20600	330 60 244 2.2 20600		
82	242 46 238 1.9 19600	282 52 242 2.1 19700	298 55 244 2.2 19700	313 57 246 2.3 19700	326 59 248 2.3 19800			
86	278 52 244 2.3 18400	317 58 248 2.5 18400	332 61 250 2.6 18500	346 63 252 2.6 18500	359 65 254 2.7 18500			
90	300 56 250 2.6 17100	335 61 254 2.7 17200	349 64 256 2.8 17200	363 66 258 2.9 17200				
94	317 59 256 2.8 15900	350 64 260 3.0 15900	363 66 262 3.0 16000	375 67 264 3.1 16000				
CORRECTIONS		DISTANCE		TIME	FUEL	LEVEL OFF		
ENGINE ANTI ICE ON		+ 15 %		+ 12 %	+ 18 %	- 200 FT		
TOTAL ANTI ICE ON		+ 20 %		+ 24 %	+ 33 %	- 700 FT		



 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>3/4</b> 30 MAR 12
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## CRUISE AT LONG RANGE CRUISE SPEED

### ONE ENGINE OUT

LONG RANGE CRUISE - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST LIMITS NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%	EPR FUEL FLOW (KG/H)		MACH IAS (KT)	
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250	
50	1.181 .442	1.250 .480	1.319 .507	1.369 .530	1.417 .549	1.472 .571	
	1972 244	1915 241	1856 236	1874 237	1870 236	1875 236	
54	1.199 .454	1.281 .494	1.363 .529	1.411 .548	1.464 .569	1.520 .588	
	2093 251	2047 249	2029 246	2028 246	2032 245	2034 243	
58	1.223 .466	1.310 .506	1.402 .546	1.454 .567	1.510 .587	1.554 .591	
	2224 258	2174 255	2185 255	2190 254	2196 253	2138 244	
62	1.253 .484	1.344 .521	1.441 .562	1.497 .583	1.536 .585	1.568 .551	
	2387 268	2330 263	2343 262	2354 262	2277 252	2121 227	
66	1.278 .495	1.380 .538	1.480 .578	1.534 .595	1.548 .548		
	2519 274	2499 272	2504 270	2503 267	2252 235		
70	1.303 .506	1.412 .552	1.517 .591	1.547 .578			
	2651 280	2651 278	2667 277	2519 260			
74	1.327 .515	1.446 .567	1.549 .600	1.562 .528			
	2785 286	2818 286	2811 281	2482 236			
78	1.359 .531	1.478 .579	1.557 .577				
	2968 295	2979 293	2795 270				
82	1.385 .543	1.510 .592	1.574 .523				
	3124 301	3146 299	2758 243				
86	1.412 .554	1.519 .580					
	3282 308	3163 293					
90	1.440 .567	1.529 .559					
	3449 315	3158 282					
94	1.456 .569	1.549 .512					
	3540 316	3139 258					
ENGINE ANTI ICE ON △FUEL = + 2 %				TOTAL ANTI ICE ON △FUEL = + 4 %			

 <b>DRAGONAIR</b> <b>A320/A321</b> QUICK REFERENCE HAND BOOK	<b>IN FLIGHT PERFORMANCE</b>	<b>FPE-OEI</b> <b>4/4</b>
		30 MAR 12

## IN CRUISE QUICK CHECK LONG RANGE

### ONE ENGINE OUT

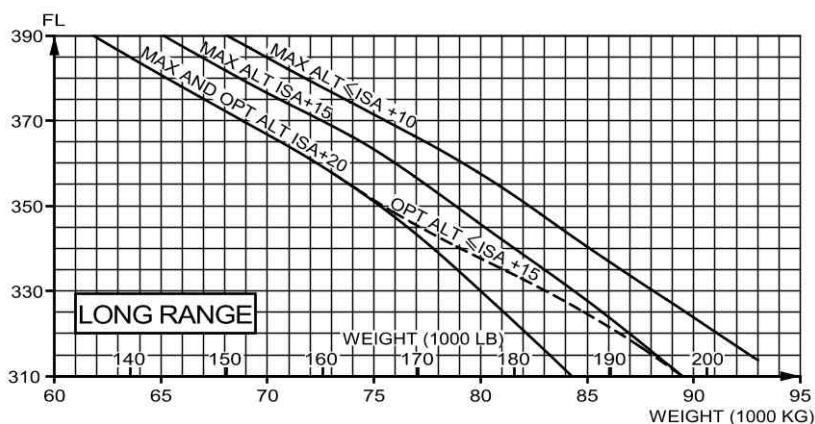
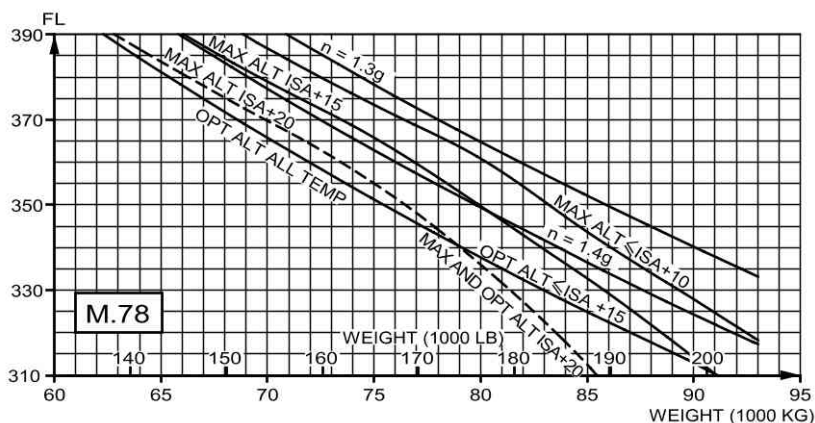
IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING - 1 ENGINE OUT									
CRUISE : LONG RANGE - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 60000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
AIR DIST.		FLIGHT LEVEL					CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
(NM)	100	150	200	220	240	250	FL100 FL150	FL200 FL220	FL240 FL250
200	1510 0.46	1317 0.44	1180 0.42	1131 0.41	1083 0.41	1061 0.41	9	7	6
300	2259 1.06	2008 1.03	1826 0.59	1762 0.58	1699 0.57	1670 0.58	15	14	13
400	3004 1.27	2694 1.22	2468 1.17	2388 1.15	2312 1.14	2276 1.15	21	20	20
500	3745 1.47	3377 1.41	3106 1.34	3010 1.32	2921 1.31	2877 1.32	27	27	27
600	4481 2.08	4055 2.00	3739 1.52	3628 1.49	3527 1.48	3475 1.49	34	34	34
700	5212 2.28	4729 2.19	4369 2.10	4241 2.07	4129 2.04	4069 2.05	40	40	41
800	5938 2.49	5400 2.39	4994 2.28	4851 2.24	4727 2.21	4659 2.22	46	47	48
900	6659 3.10	6066 2.58	5615 2.46	5456 2.41	5320 2.38	5247 2.38	52	53	54
1000	7376 3.31	6728 3.17	6232 3.04	6058 2.59	5907 2.55	5831 2.55	58	60	61
1100	8088 3.52	7387 3.37	6845 3.22	6656 3.16	6490 3.12	6413 3.11	63	66	68
1200	8798 4.13	8042 3.56	7454 3.41	7250 3.34	7070 3.29	6991 3.28	69	73	74
1300	9506 4.34	8693 4.16	8059 3.59	7840 3.52	7645 3.46	7566 3.44	75	79	81
1400	10209 4.55	9340 4.36	8661 4.17	8427 4.10	8217 4.03	8137 4.00	81	86	87
ENGINE ANTI ICE ON △FUEL = + 2 %					TOTAL ANTI ICE ON △FUEL = + 4 %				

FLIP23 A321-131 IAE V2530-A5 3610 03301.001011 0250300 .7801 .000100 140 0300350 60 0 100100 40100 18590 CL-N0-04-07-150



## OPTIMUM & MAXIMUM ALTITUDES

### ALL ENGINES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
$\leq$ ISA +10	Max ALT : - 500 ft Opt ALT : - 300 ft	Max ALT : -1 100 ft Opt ALT : - 300 ft
ISA +15	Max ALT : - 700 ft Opt ALT : - 300 ft	Max ALT : -1 500 ft Opt ALT : - 600 ft
ISA +20	Max ALT : -1 000 ft Opt ALT : -1 000 ft	Max ALT : -2 300 ft Opt ALT : -2 300 ft

## IN CRUISE QUICK CHECK AT A GIVEN MACH NUMBER

**ALL ENGINES**

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 – DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 140 KG (6MIN)									
REF. INITIAL WEIGHT = 65000 KG NORMAL AIR CONDITIONING ANTI-ICING OFF				ISA CG = 33.0 %		FUEL CONSUMED (KG)			
						TIME (H.MIN)			
AIR	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
DIST.							FL290	FL330	FL370
(NM)	290	310	330	350	370	390	FL310	FL350	FL390
200	1037 0.36	978 0.36	926 0.36	880 0.36	842 0.36	816 0.36	1	2	4
400	2281 1.02	2158 1.02	2049 1.02	1956 1.03	1885 1.03	1854 1.03	7	10	20
600	3518 1.27	3329 1.28	3164 1.29	3023 1.29	2918 1.30	2875 1.30	13	18	33
800	4747 1.53	4494 1.54	4271 1.55	4081 1.56	3939 1.56	3882 1.56	19	25	45
1000	5970 2.19	5650 2.20	5370 2.22	5131 2.23	4951 2.23	4874 2.23	25	33	57
1200	7185 2.45	6799 2.47	6461 2.48	6171 2.49	5952 2.50	5852 2.50	31	40	67
1400	8393 3.11	7941 3.13	7544 3.14	7204 3.16	6944 3.17	6816 3.17	36	47	77
1600	9596 3.37	9076 3.39	8620 3.41	8228 3.43	7925 3.44	7768 3.44	41	54	86
1800	10792 4.03	10205 4.05	9689 4.07	9244 4.09	8898 4.10	8707 4.10	46	60	94
2000	11983 4.29	11327 4.31	10751 4.34	10254 4.36	9865 4.37	9640 4.37	51	66	102
2200	13167 4.55	12442 4.58	11806 5.00	11256 5.03	10825 5.04	10566 5.04	56	73	110
2400	14345 5.21	13551 5.24	12855 5.26	12251 5.29	11776 5.31	11482 5.31	61	79	117
2600	15518 5.47	14654 5.50	13897 5.53	13239 5.56	12720 5.58	12388 5.58	65	85	125
2800	16685 6.13	15750 6.16	14932 6.19	14220 6.23	13657 6.24	13286 6.24	68	90	131
3000	17851 6.39	16841 6.42	15961 6.46	15195 6.49	14586 6.51	14175 6.51	72	96	138
ECON AIR CONDITIONING △FUEL = - 0.6 %			ENGINE ANTI ICE ON △FUEL = + 2 %			TOTAL ANTI ICE ON △FUEL = + 5 %			

FLIP22B A321-131 IAE V2530-A53610 03301.300211 0250300 .7800 .000200 140 0300350 65 0 100100 40100 18590
CL-N0-CL-004-009-1E0

## COST INDEX FOR LONG RANGE CRUISE SPEED

**ALL ENGINES**

- For a quick determination of the  $CI_{LRC}$ , use:
- $CI_{LRC}$  = 50 kg/min in the FMGC.
  - or
  - $CI_{LRC}$  = 70 (100 lb/h) in the FMGC.



## STANDARD DESCENT

### ALL ENGINES

DESCENT - M.78/300KT/250KT									
IDLE THRUST NORMAL AIR CONDITIONING ANTI-ICING OFF			ISA CG=33.0%		MAXIMUM CABIN RATE OF DESCENT 350FT/MIN				
WEIGHT (1000KG)	60				80				IAS (KT)
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	TIME (MIN)	FUEL (KG)	DIST. (NM)	EPR	
390	16.7	173	100	IDLE					241
370	15.9	166	95	IDLE	18.0	186	108	IDLE	252
350	15.2	159	90	IDLE	17.3	179	103	IDLE	264
330	14.6	153	85	IDLE	16.6	173	98	IDLE	277
310	14.0	148	81	IDLE	16.0	167	93	IDLE	289
290	13.5	143	76	IDLE	15.3	161	88	IDLE	300
270	12.8	137	71	IDLE	14.5	154	81	IDLE	300
250	12.1	131	66	IDLE	13.6	146	75	IDLE	300
240	11.7	127	63	IDLE	13.2	143	72	IDLE	300
220	11.0	121	58	IDLE	12.3	135	66	IDLE	300
200	10.2	114	53	IDLE	11.5	127	60	IDLE	300
180	9.5	108	48	IDLE	10.5	119	54	IDLE	300
160	8.7	100	43	IDLE	9.6	110	48	IDLE	300
140	7.9	93	39	IDLE	8.7	101	42	IDLE	300
120	7.1	85	34	IDLE	7.7	92	37	IDLE	300
100	6.3	76	29	IDLE	6.7	81	31	IDLE	300
50	2.4	30	10	IDLE	2.5	32	11	IDLE	250
15	.0	0	0	IDLE	.0	0	0	IDLE	250
CORRECTIONS		ECON AIR CONDITIONING		ENGINE ANTI ICE ON		TOTAL ANTI ICE ON		PER 1° ABOVE ISA	
TIME		—		+ 1 min		+ 3 min		+ 0.2 %	
FUEL		— 2 %		+ 17 %		+ 90 %		+ 0.7 %	
DISTANCE		—		+ 4 %		+ 20 %		+ 0.4 %	

10B-08FA321-131IAEV2530-A523100000C5KG330001859000-1-350.015.0.00003.780300.000250.0000 FCOM-NO-03-05-30-002-150

## QUICK DETERMINATION TABLE OF ALTERNATE FLIGHT PLANNING

ALL ENGINES

ALTERNATE PLANNING FROM DESTINATION TO ALTERNATE AIRPORT									
GO-AROUND : 120 KG - CLIMB : 250KT/300KT/M.78 - CRUISE : LONG RANGE									
DESCENT : M.78/300KT/250KT - VMC PROCEDURE : 100 KG (4MIN)									
REF. LDG WT AT DEST. = 60000 KG				ISA		FUEL CONSUMED (KG)			
NORMAL AIR CONDITIONING				CG = 33.0 %					
ANTI-ICING OFF				TIME (H.MIN)					
AIR							CORRECTION ON		
DIST.	FLIGHT LEVEL						FUEL CONSUMPTION		
(NM)	100	150	200	250	290	330	FL100 FL150	FL200 FL250	FL290 FL330
40	601 0.12						2		
60	775 0.16						4		
80	950 0.20	898 0.19					5		
100	1124 0.23	1056 0.23	1035 0.22				6	6	
120	1299 0.27	1213 0.26	1172 0.26	1172 0.25			7	7	
140	1474 0.31	1371 0.30	1310 0.29	1294 0.28			8	8	
160	1649 0.35	1529 0.33	1447 0.32	1416 0.31	1423 0.31		9	8	10
180	1825 0.39	1687 0.37	1585 0.35	1539 0.35	1536 0.34	1547 0.33	10	9	12
200	2000 0.43	1845 0.40	1723 0.38	1662 0.38	1650 0.36	1654 0.36	11	10	13
220	2176 0.46	2003 0.44	1860 0.42	1784 0.41	1763 0.39	1761 0.39	12	10	14
240	2352 0.50	2161 0.47	1998 0.45	1907 0.44	1877 0.42	1869 0.41	13	11	15
260	2529 0.54	2320 0.50	2136 0.48	2030 0.47	1991 0.45	1976 0.44	15	12	16
280	2705 0.58	2479 0.54	2274 0.51	2153 0.50	2105 0.48	2084 0.47	16	13	17
300	2882 1.02	2638 0.57	2413 0.54	2277 0.53	2220 0.51	2192 0.50	17	13	18
320	3059 1.05	2797 1.01	2551 0.58	2400 0.57	2334 0.54	2300 0.53	18	14	20
340	3236 1.09	2956 1.04	2689 1.01	2524 1.00	2449 0.57	2408 0.55	19	15	21
360	3414 1.13	3115 1.07	2828 1.04	2647 1.03	2563 1.00	2516 0.58	20	16	22
380	3591 1.17	3275 1.11	2966 1.07	2771 1.06	2678 1.03	2625 1.01	21	16	23
400	3769 1.21	3435 1.14	3105 1.10	2895 1.09	2793 1.06	2733 1.04	22	17	24
420	3947 1.24	3594 1.18	3243 1.14	3019 1.12	2908 1.09	2842 1.06	23	18	25
440	4125 1.28	3754 1.21	3382 1.17	3143 1.15	3023 1.12	2951 1.09	25	19	26
460	4304 1.32	3915 1.24	3521 1.20	3267 1.18	3138 1.15	3060 1.12	26	20	27
480	4482 1.35	4075 1.28	3660 1.23	3392 1.21	3253 1.18	3169 1.15	27	20	28
500	4661 1.39	4235 1.31	3799 1.26	3516 1.25	3369 1.21	3278 1.18	28	21	30
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
ΔFUEL = - 1 %			ΔFUEL = + 4 %			ΔFUEL = + 6 %			

CL-W0-04-13-155



# IN CRUISE QUICK CHECK FL 100 LONG RANGE

## FLIGHT WITHOUT CAB PRESS

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING							
CRUISE : LONG RANGE - DESCENT : 250KT							
IMC PROCEDURE : 140 KG (6MIN)							
FL100							
NORMAL AIR CONDITIONING ANTI-ICING OFF		ISA CG = 25.0%		FUEL CONSUMED (KG) TIME (H.MIN)			
AIR DIST. (NM)	INITIAL WEIGHT (1000KG)						
	65	70	75	80	85	90	95
40	337 0.15	339 0.15	342 0.15	347 0.15	353 0.15	361 0.15	370 0.15
60	515 0.18	523 0.18	531 0.18	540 0.18	551 0.18	561 0.18	571 0.18
80	693 0.22	706 0.22	719 0.21	733 0.21	748 0.21	761 0.21	773 0.21
100	871 0.26	890 0.25	908 0.25	926 0.24	945 0.24	960 0.24	975 0.24
120	1048 0.30	1073 0.29	1096 0.28	1119 0.28	1141 0.27	1160 0.27	1176 0.27
140	1226 0.33	1256 0.32	1284 0.31	1312 0.31	1338 0.30	1359 0.30	1378 0.30
160	1403 0.37	1438 0.36	1472 0.35	1504 0.34	1534 0.33	1559 0.33	1580 0.33
180	1580 0.41	1621 0.39	1659 0.38	1696 0.37	1731 0.36	1758 0.36	1782 0.36
200	1757 0.45	1803 0.43	1846 0.42	1888 0.41	1927 0.39	1957 0.39	1984 0.39
220	1933 0.48	1985 0.46	2034 0.45	2080 0.44	2123 0.43	2156 0.42	2185 0.42
240	2110 0.52	2167 0.50	2221 0.48	2271 0.47	2319 0.46	2355 0.45	2387 0.45
260	2286 0.56	2349 0.53	2407 0.52	2463 0.51	2515 0.49	2554 0.48	2589 0.48
280	2462 1.00	2530 0.57	2594 0.55	2654 0.54	2710 0.52	2753 0.51	2791 0.51
300	2637 1.04	2711 1.00	2780 0.58	2845 0.57	2906 0.55	2952 0.54	2993 0.54
320	2813 1.07	2892 1.04	2967 1.02	3036 1.00	3101 0.59	3150 0.57	3195 0.57
340	2988 1.11	3073 1.07	3153 1.05	3227 1.04	3296 1.02	3349 1.00	3397 1.00
360	3164 1.15	3254 1.11	3339 1.09	3417 1.07	3491 1.05	3547 1.03	3599 1.03
380	3339 1.19	3434 1.15	3524 1.12	3608 1.10	3686 1.08	3745 1.05	3800 1.05
400	3513 1.23	3615 1.18	3710 1.15	3798 1.14	3881 1.12	3943 1.08	4001 1.08
420	3688 1.26	3795 1.22	3895 1.19	3988 1.17	4076 1.15	4141 1.11	4202 1.11
440	3862 1.30	3975 1.25	4080 1.22	4177 1.20	4270 1.18	4339 1.14	4402 1.14
460	4037 1.34	4154 1.29	4265 1.26	4367 1.24	4465 1.22	4537 1.17	4603 1.17
480	4211 1.38	4334 1.33	4450 1.29	4557 1.27	4659 1.25	4735 1.20	4803 1.20
500	4384 1.42	4513 1.36	4635 1.33	4746 1.30	4853 1.28	4932 1.23	5003 1.23
520	4558 1.46	4692 1.40	4819 1.36	4935 1.34	5047 1.32	5130 1.26	5203 1.26
540	4732 1.49	4871 1.43	5003 1.40	5124 1.37	5241 1.35	5327 1.29	5403 1.29
AIR CONDITIONING OFF △FUEL = - 2 %			ENGINE ANTI ICE ON △FUEL = + 3 %		TOTAL ANTI ICE ON △FUEL = + 5 %		

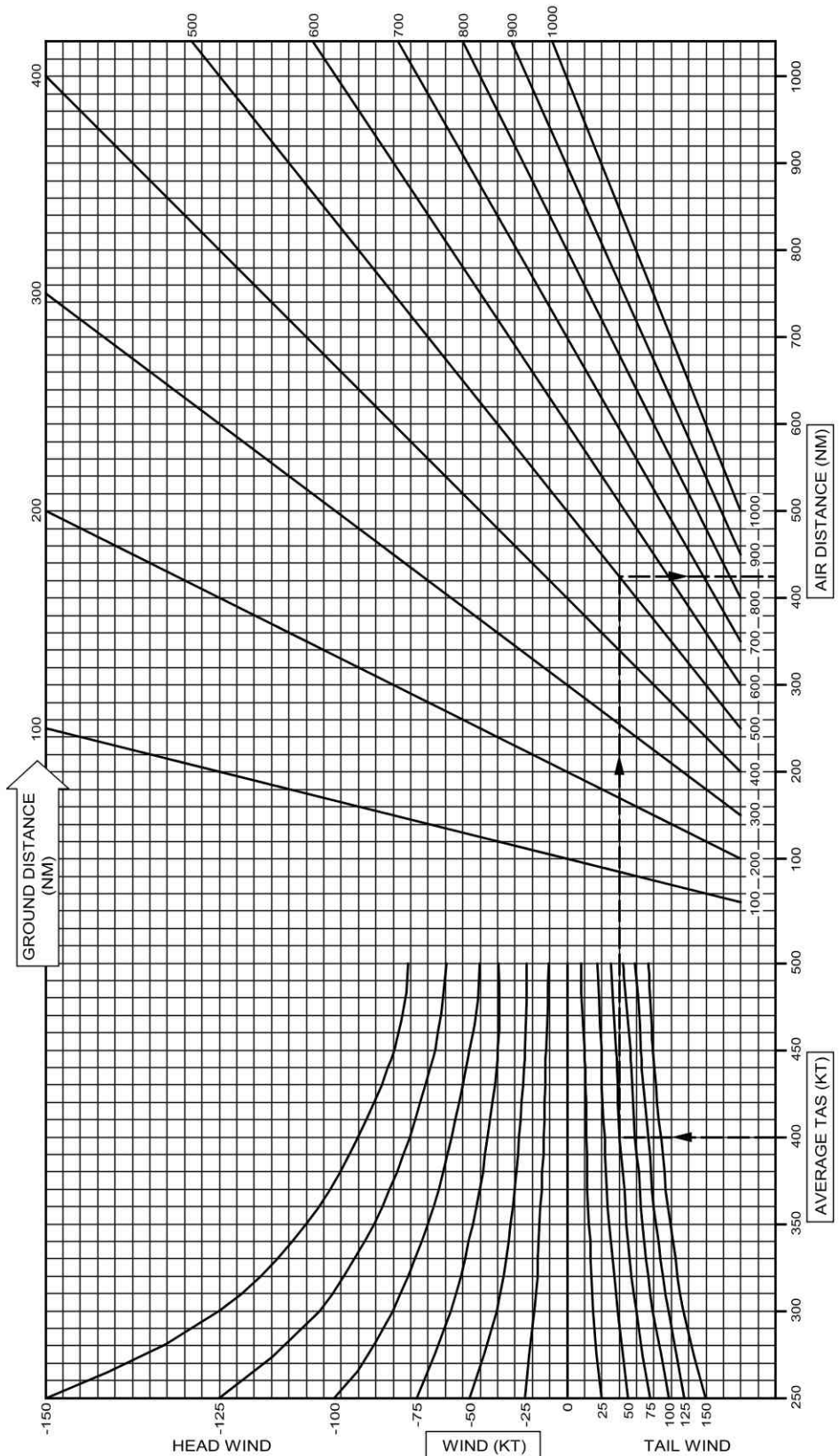
 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	IN FLIGHT PERFORMANCE	FPE-CAB <b>2/2</b>
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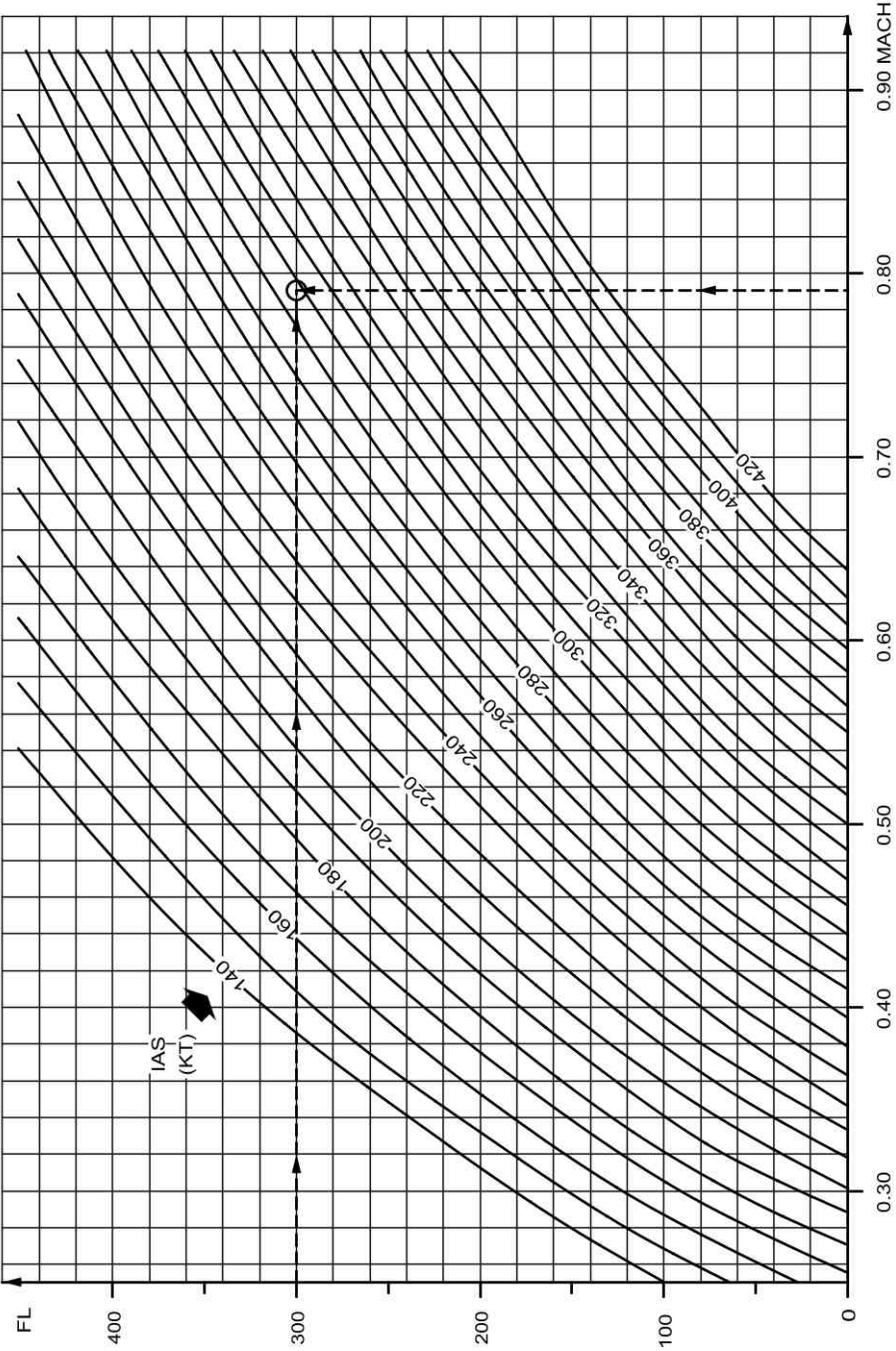




## GROUND DISTANCE / AIR DISTANCE CONVERSION



**IAS / MACH CONVERSION**





## USE OF FUEL PENALTY FACTOR TABLES

### USE OF THE FUEL PENALTY FACTORS

The Fuel Penalty Factors provided in the following tables are conservative values, given as a guideline in order to increase the crew awareness and to help the decision making.

Note: In case of failure impacting the fuel consumption, the fuel predictions provided by the FMS are no longer reliable (except in One Engine Inoperative OEI condition). The flight crew must still compute and monitor the actual fuel consumption.

Refer to the following tables in order to assess the impact of the failure on the fuel consumption after any ECAM alert that:

- Displays the line INCREASED FUEL CONSUMP in the STATUS SD page, or
- Displays Flight Control Surfaces in the INOP SYS, or
- Impacts the Landing Gears or Landing Gear Doors retraction.

The Fuel Penalty Factors given in these tables have been calculated taking into account:

- The FUEL CRITICAL INOP SYS, and
- The aircraft configuration, speed or altitude described in the CONDITIONS column.

Ensure that all these conditions are well met before applying the corresponding Fuel Penalty Factor.

### METHODOLOGY

The methodology is the following:

- Check the **ECAM ALERT table** to determine if a Fuel Penalty Factor is applicable depending on the CONDITIONS column, then
- Check the **INOP SYS table** in order to determine if, according to the actual aircraft status, there is a Fuel Penalty Factor applicable depending on the CONDITIONS column
- If only one Fuel Penalty Factor (FPF) is applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOB at DEST}) \times \text{FPF}$$

This additional fuel must be added to the fuel predictions provided by the FMS.
- If two or more Fuel Penalty Factors (FPF) are applicable:  

$$\text{ADDITIONAL FUEL} = (\text{FOB} - \text{EFOB at DEST}) \times (\text{FPF1} + \text{FPF2} + \dots)$$

This additional fuel must be added to the fuel predictions provided by the FMS.

Note: Due to previous failures in flight or dispatch under MEL, some failures could have an impact on the fuel consumption:

- Without being mentioned in the ECAM ALERT table (only through INOP SYS table), or
- If mentioned in the ECAM ALERT table, with additional INOP SYS (other than the one(s) described in the FUEL CRITICAL INOP SYS column for this specific ECAM alert) impacting also the fuel consumption.

### Example:

- Dispatch with the ELAC 1 inoperative under MMEL
- HYD G SYS LO PR ECAM caution in flight
- These two failures lead to the loss of the left aileron
- INOP SYS will displayed "L AIL"

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is applicable (spoiler extended), sum the corresponding factor with the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

FPF (HYD G SYS LO PR) = 10 %

FPF (INOP SYS: L AIL) = 8 %

Therefore, ADDITIONAL FUEL = (FOB - EFOB at DEST) x (10 % + 8 %)

If the Fuel Penalty Factor of the HYD G SYS LO PR ECAM alert is not applicable (spoiler remains retracted), apply the Fuel Penalty Factor related to the INOP SYS "L(R) AIL" partially extended.

Therefore, ADDITIONAL FUEL = (FOB - EFOB at DEST) x 8 %

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## FUEL PENALTY FACTORS/ECAM ALERT TABLE

SYS	ECAM ALERT	FUEL CRITICAL INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
ELEC	AC BUS 1 FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	DC ESS BUS FAULT (equivalent to B SYS LO PR)	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
F/CTL	L(R) AIL FAULT	L(R) AIL	If one aileron is indicated fully extended (upwards or downwards)	27 %
		L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	SPLR FAULT	SPLR (affected)	If one spoiler is suspected fully extended See <b>Cruise Conditions:</b> <b>OPT SPEED..... GDOT +10KT</b> Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt increase speed to fly out of buffet condition. <b>CRUISE ALT.....AS REQUIRED</b> Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.	55 %
			If one spoiler or one pair of spoilers is partially extended (zero hinge moment)	10 %
		SPLR 3 with BLUE HYD	If spoiler 3 is partially extended after the loss of the B hydraulic system See	Up to 4 %
		SPLR 1 or 5 with GREEN HYD	If spoiler 1 or 5 is partially extended after the loss of the G hydraulic system See	Up to 9 % See
		SPLR 2 or 4 with YELLOW HYD	If spoiler 2 or 4 is partially extended after the loss of the Y hydraulic system See	Up to 9 % See
	FLAPS FAULT/LOCKED	FLAPS	If Flaps are extended	80 %
	SLATS FAULT/LOCKED	SLATS	If Slats are extended	60 %
	SLATS + FLAPS FAULT/LOCKED	SLATS+FLAPS	If Slats and Flaps are extended	100 %
HYD	B SYS LO PR	SPLR 3	If L(R) spoiler 3 is indicated extended (at the time of the failure)	10 %
	G SYS LO PR	SPLR 1+5	If L(R) spoiler 5 is indicated extended (at the time of the failure)	10 %
	Y SYS LO PR	SPLR 2+4	If L(R) spoilers 2 and 4 are indicated extended (at the time of the failure)	20 %
	G+B SYS LO PR	L+R AIL SPLR 1+3+5 L ELEV	Both ailerons are failed Spoilers 1, 3 and 5 See Left elevator is failed RAT is extended	10 % to 15 % See
	G+Y SYS LO PR	SPLR 1+2+4+5 STABILIZER	Stabilizer is jammed Spoilers 1, 2, 4 and 5 See	0 % to 10 % See
	B+Y SYS LO PR	SPLR 2+3+4 R ELEV	Spoilers 2, 3 and 4 See Right elevator is failed RAT extended	3 % to 10 % See
L/G	SHOCK ABSORBER FAULT	L/G RETRACT	All landing gears are extended (Also refer to PRO-SPO-25-10)	180 %
	GEAR NOT UNLOCKED			
	BOGIE ALIGN FAULT (option)			
	GEAR UNLOCK FAULT			
	DOORS NOT CLOSED	L/G DOOR	All landing gears doors are extended	15 %

(1) During the flight, the spoiler(s) may gradually extend and increase(s) the fuel consumption.

(2) A spoiler can be suspected fully extended (runaway) if high roll rate has been experienced immediately after the failure, associated with a possible AP disconnection. A visual inspection, if time permits, can also confirm the full extension of the spoiler.

(3) The maximum value of the Fuel Penalty Factor provided in the table considers that the two pairs of corresponding spoilers gradually extend during the flight.

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(4) The minimum value of the Fuel Penalty Factor provided in the table considers that all spoilers remain retracted. The maximum value has been calculated considering that all impacted spoilers gradually extend during the flight.

<b>FUEL PENALTY FACTORS/INOP SYS TABLE</b>
--------------------------------------------

SYS	INOP SYS	CONDITIONS	FUEL PENALTY FACTOR
F/CTL	L(R) AIL or L+R AIL	If one or both aileron(s) is/are indicated partially extended	8 %
	FLAPS	If Flaps are extended	80 %
	SLATS	If Slats are extended	60 %
	SLATS+FLAPS	If Slats and Flaps are extended	100 %
L/G	L/G DOOR	All landing gears doors are extended	15 %

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**OPERATIONAL DATA**

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**OPS-PLP PRELIMINARY PAGES**

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**SEVERE TURBULENCE..... OPS.01**

**Hydraulic Architecture..... OPS.02**

**Flight Controls Architecture.....OPS.03**

**Required Equipment for CAT2 and CAT3..... OPS.04**

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## SEVERE TURBULENCE

### SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED

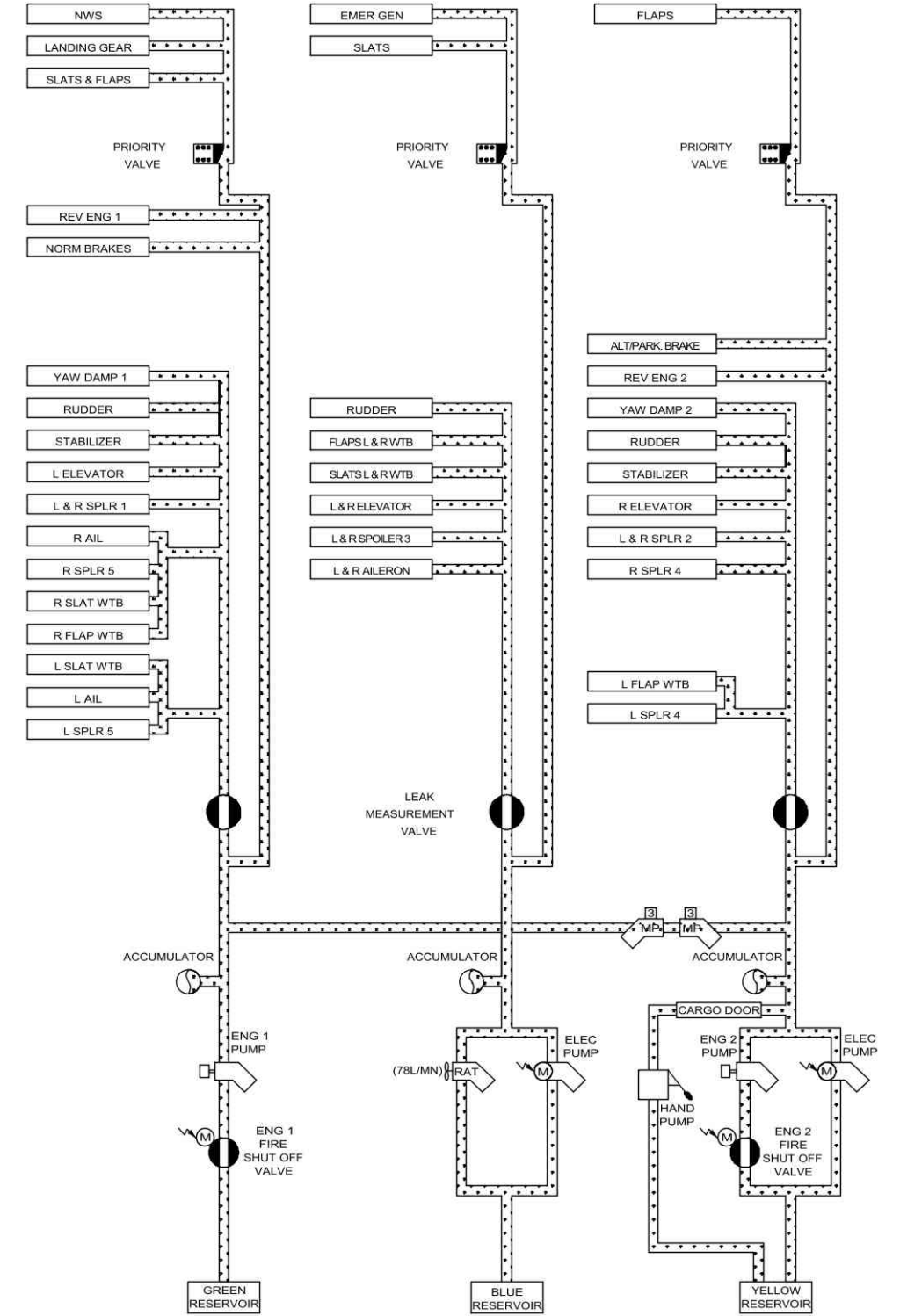
FL	SPD or Mach	GROSS WEIGHT (1000 kg)										
		54	58	62	66	70	74	78	82	86	90	94
		N1 %										
390	0.76	79.4	80.6	-	-	-	-	-	-	-	-	-
370	0.76	77.9	78.9	80.0	81.2	-	-	-	-	-	-	-
350	0.76	77.2	77.9	78.8	79.7	80.7	-	-	-	-	-	-
330	0.76	76.9	77.6	78.2	79.0	79.8	80.7	81.6	-	-	-	-
310	0.76	76.7	77.3	77.9	78.5	79.2	79.9	80.6	81.5	82.4	-	-
290	0.76	76.7	77.2	77.7	78.2	78.8	79.4	80.0	80.6	81.4	82.1	83.0
270	300	76.2	76.6	77.0	77.5	78.0	78.5	79.1	79.6	80.3	80.9	81.6
250	300	75.0	75.4	75.8	76.2	76.7	77.1	77.7	78.2	78.9	79.5	80.2
200	300	72.2	72.5	72.9	73.3	73.7	74.2	74.7	75.2	75.8	76.4	77.0
150	270	65.5	65.9	66.5	67.0	67.7	68.4	69.2	70.3	71.0	71.8	72.6
100	270	62.5	62.9	63.5	64.0	64.6	65.3	66.0	66.8	67.6	68.4	69.2
50	270	59.1	59.5	60.0	60.5	61.1	61.8	62.6	63.4	64.2	65.0	65.7

SIGNS..... ON  
 AUTO PILOT..... KEEP ON  
 A/THR (when thrust changes become excessive)..... DISCONNECT  
 DESCENT..... CONSIDER

*Consider descending to or below OPT FL in order to increase the margin to buffet*

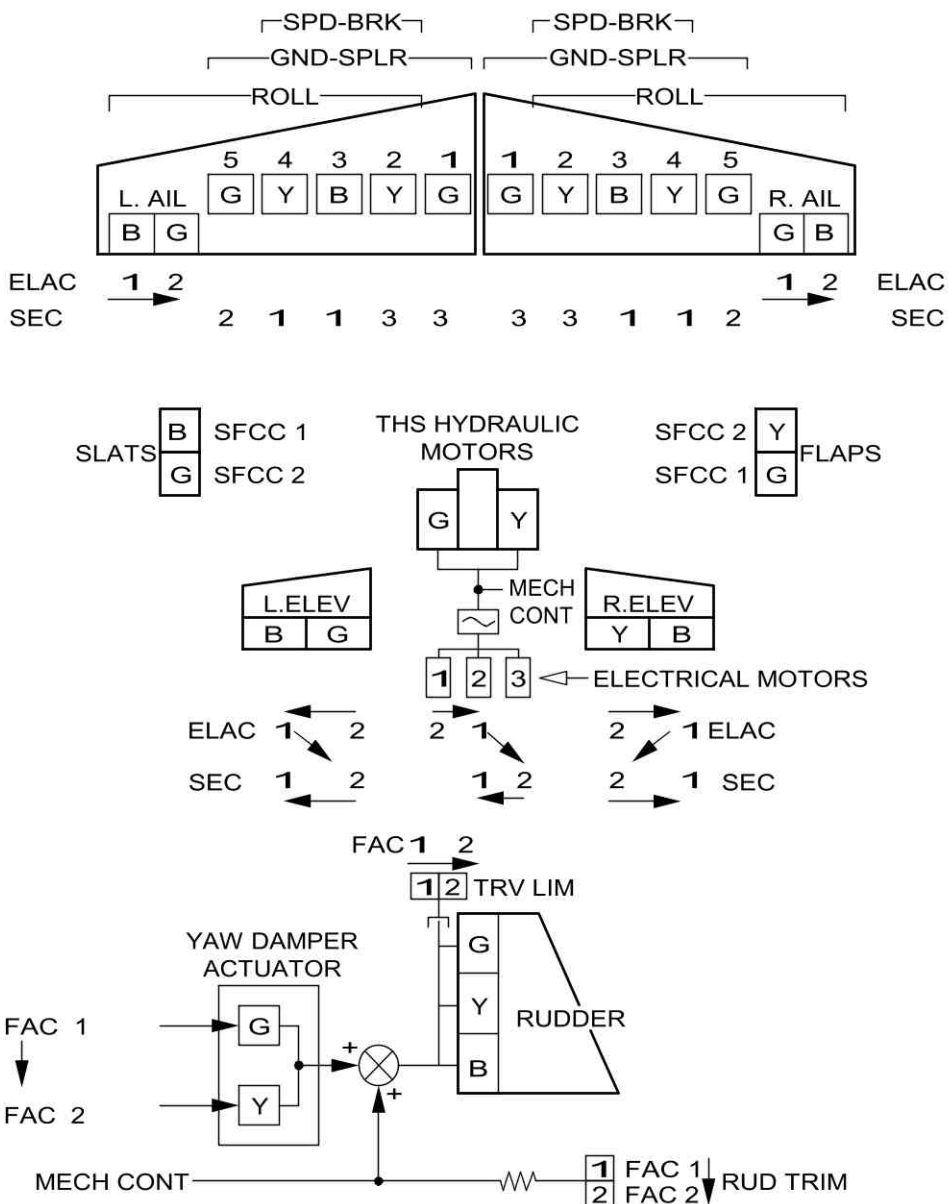
● **FOR APPROACH:**

A/THR in managed speed.....USE





## FLIGHT CONTROLS ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

G B Y indicates the hydraulic power source for each servo control

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## REQUIRED EQUIPMENT FOR CAT2 AND CAT3

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHRUST	0	1	1
	FMA	1	2	2
	A/THR CAUTION	0	1	1
	ELECTRICAL SUPPLY SPLIT	0	0	1
	FAC	1	1	2
	ELAC	1	1	2
	YAW DAMPER/RUDDER TRIM	1/1	1/1	2/2
	HYDRAULIC CIRCUIT	2	2	3
	PFD	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	ANTISKID	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	NOSEWHEEL STEERING	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
NOT FMGS MONITORED FOR FMA LDG CAPABILITY	AP DISCONNECT PB	2	2	2
	"AP OFF" ECAM WARNING	1	1	2
	"AUTOLAND" LIGHT	1	1	1
	RUDDER TRAVEL LIMIT SYSTEM	1 required for autoland with crosswind higher than 12 kt		
	WINDSHIELD HEAT (L or R windshield)	1 for PF		
	WINDSHIELD WIPERS OR RAIN REPELLENT (if activated)	1 for PF		
	ND	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY )	1	1	1
DH INDICATION	1 for PNF			

(1) For automatic rollout, one is required. For autoland without automatic rollout, none is required.

- Note:**
- Flight crews are not expected to check the equipment list before approach. When an ECAM or local caution occurs, the crew should use the list to confirm the landing capability.
  - On ground, the equipment list determines which approach category the aircraft will be able to perform at the next landing.
  - Electrical power supply split : This ensures that each FMGC is powered by an independent electrical source (AC and DC).
  - Failure of antiskid and/or nosewheel steering mechanical parts are not monitored for landing capability.
  - The DH will be displayed on the FMA, and the "Hundred Above" and "Minimum" auto callouts will be announced, provided that the DH value has been entered on the MCDU.

# **OPERATIONS ENGINEERING BULLETINS**

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## **OEBPROC-PLP PRELIMINARY PAGES**

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## **OEBPROC-11 "ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight**

<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.00</b>
----------------------------------------------------------------	--------------

<b>"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight..</b>	<b>11.01</b>
----------------------------------------------------------------	--------------

## **OEBPROC-17 Dual FM Reset upon Radial Fix Info Entry**

<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.00</b>
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<b>Dual FM Reset upon Radial Fix Info Entry.....</b>	<b>17.01</b>
------------------------------------------------------	--------------

## **OEBPROC-31 Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches**

<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.00</b>
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<b>Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches.....</b>	<b>31.01</b>
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## **OEBPROC-36 No SRS Engagement During Go Around in the Case of EPR Mode Fault**

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.00</b>
------------------------------------------------------------------------------	--------------

<b>No SRS Engagement During Go Around in the Case of EPR Mode Fault.....</b>	<b>36.01</b>
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## **OEBPROC-38 Erroneous Radio Altimeter Height Indication**

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.00</b>
---------------------------------------------------------	--------------

<b>Erroneous Radio Altimeter Height Indication.....</b>	<b>38.01</b>
---------------------------------------------------------	--------------

## **OEBPROC-40 AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT**

<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.00</b>
------------------------------------------------------------------------	--------------

<b>AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT.....</b>	<b>40.01</b>
------------------------------------------------------------------------	--------------

## **OEBPROC-43 F/CTL SPOILER FAULT**

<b>F/CTL SPOILER FAULT.....</b>	<b>43.00</b>
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<b>F/CTL SPOILER FAULT.....</b>	<b>43.01</b>
---------------------------------	--------------

**OEBPROC-44 L/G GEAR NOT DOWNLOCKED**

L/G GEAR NOT DOWNLOCKED.....	44.00
■ L/G GEAR NOT DOWNLOCKED ■.....	44.01



## OEB11 Issue 1.0

### "ENG 1(2) OIL FILTER CLOG"

### ECAM CAUTION DURING FLIGHT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 152.

Engine bearing N°3 failure cases, leading to in-flight shutdowns and, in some cases, accompanied by oil door/smoke in the cabin/cockpit, have been reported on V2500-A5 engines. In a recent case, where a N°3 bearing failure is highly suspected, significant smoke entered the cabin and cockpit, leading the crew to deploy the oxygen masks and divert. In most of these events, an **ENG 1(2) OIL FILTER CLOG** ECAM caution was displayed prior to the in-flight shutdown.

**Applicable to:**

All A320 family aircraft fitted V2500-A5 engines.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013205.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTI					
	OEBPROC-11		"ENG 1(2) OIL FILTER CLOG" ECAM Caution During Flight	00013213.0001001	30 MAR 12
Criteria: V2500-A5 Applicable to: B-HTI					



## "ENG 1(2) OIL FILTER CLOG" ECAM CAUTION DURING FLIGHT

### ECAM ENTRY

ENG 1(2) OIL FILTER CLOG

### PROCEDURE

Apply the following paper procedure if the ECAM triggers the ENG 1(2) OIL FILTER CLOG ECAM caution:

**ENG BLEED (affected side)..... OFF**

*Prevents possible bleed contamination by engine oil.*

**PACK (affected side)..... OFF**

*Switching OFF one pack enables the remaining pack to operate at 120 %, without any risk of misbehavior on the remaining bleed. Keep the pack on (affected side), in case of an MEL dispatch with the other pack inoperative.*

*The pack that has been switched off remains available, with the crossbleed valve open. Therefore, switch it on, in case of a subsequent independent malfunction affecting the operating pack.*

**X BLEED..... OPEN**

*Opening the crossbleed valve enables the wing anti-ice to be used, when needed.*

**CLOSELY MONITOR ENGINE PARAMETERS** for surge / stall, oil pressure variations, abnormal engine vibrations and, when necessary, apply the associated procedure.

- **If, after the oil filter clog indication, the engine experiences or has already experienced a surge/stall (audible surge detected/undetected by the ECAM) possibly accompanied by a yaw effect on the aircraft:**

**ENG (affected) THRUST LEVER..... IDLE**

*Reducing the thrust of the affected engine minimizes further damage to the engine's rotary machinery, but will not necessarily prevent more oil from entering the gas path.*

*Maintain engine at idle, and consider engine shutdown, when high vibration occurs, or oil quantity/oil pressure drops low.*

Note: *ENG 1(2) OIL FILTER CLOG ECAM caution occurring on ground during engine start are frequently due to low oil viscosity and may be self-recoverable: No maintenance action is required, if the message appears before the engine has reached a stabilized idle condition (Refer to FCOM/"ENG 1(2) OIL FILTER CLOG" procedure). Maintenance action is required, if it does not disappear when the engine is stabilized at idle.*

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## OEB17 Issue 1.0

### DUAL FM RESET UPON RADIAL FIX INFO ENTRY

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 169.

Several Operators reported that both FMS reset immediately after the flight crew inserted a FIX INFO radial that intercepted the F-PLN just prior to the last point of the approach (Missed Approach Point (MAP), or runway threshold). Therefore, this OEB is issued to provide the operational recommendations that should be applied, in order to help prevent this situation.

**Applicable to:**

All A318/A319/A320/A321 aircraft with FMS2 Pegasus :

- P1C8 MOD 31896, or
- P1C9 MOD 32222, or
- P1C11 MOD 34573, or
- P1I8 MOD 31897.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		17.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013520.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HTI				
	OEBPROC-17		Dual FM Reset upon Radial Fix Info Entry	00013521.0001001	30 MAR 12
	Criteria: 22-1090, P7520 Applicable to: B-HTI				





## DUAL FM RESET UPON RADIAL FIX INFO ENTRY

### ECAM ENTRY

NONE

### PROCEDURE

#### PREVENTIVE PROCEDURE

Do not use the FIX INFO function with any radials that could intercept the F-PLN just before the last point of the approach (less than 0.1 nm).

*Note: The last point of the approach corresponds to the runway threshold for an ILS approach, or to the Missed Approach Point (MAP) for a Non-Precision Approach (NPA).*

#### RECOVERY PROCEDURE

If disengaged, consider reengagement of the AP/FD and ATHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

##### ■ If the F-PLN is not lost:

Normal FMS operation can be recovered by clearing the radial FIX INFO, and then by re-entering the GW/CG.

##### ■ If the F-PLN is lost:

When the FMS has automatically recovered, perform the associated procedures (*Refer to ABN-22 LOSS OF FMS DATA IN DESCENT/APPROACH (Severe Reset)*).

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## OEB31 Issue 1.0

# ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 189.

This OEB is issued to provide Operators with the operational recommendations to apply in cases where the flight crew performs an RNAV or a LOC or LOC Back Course (B/C) approach with the MAP located before the runway (RWY) threshold.

This is because in such cases, the FMGC does not compute the vertical flight path correctly. As a result, it may cause the aircraft, when flown in managed vertical guidance, during an RNAV approach, to fly a vertical flight path lower than the published one on the approach procedure chart.

This anomaly also applies to the vertical deviation indication symbol, VDEV. These recommendations were originally published in *Refer to FCOM/FCOM Standard Operating Procedures - Non Precision Approach section*. Due to the fact that more and more RNAV procedures are being published in the Instrument Approach Procedures (IAP), Airbus found it necessary to publish this OEB in order to highlight these recommendations.

**Applicable to:**

All A320 family aircraft fitted with the Honeywell FMS.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		31.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013530.0003001	30 MAR 12
Criteria: SA Applicable to: B-HTI					
	OEBPROC-31		Erroneous Vertical Profile During RNAV, LOC and LOC B/C Approaches	00013531.0003001	30 MAR 12
Criteria: SA Applicable to: B-HTI					



## ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

### ECAM ENTRY

None

### PROCEDURE

#### FOR RNAV APPROACHES

For any approach labelled as RNV on MCDU:

VERIFY on the approach chart and on the MCDU that the MAP is at the runway threshold

On the MCDU F-PLN page, if the last waypoint of the active F-PLN, displayed in green, is identified as a runway (e.g. LFB032L), it means that the runway threshold is the MAP.

■ **If the MAP is located at the runway (RWY) threshold:**

Use of the vertical managed guidance mode (FINAL APP) is possible.

■ **If the MAP is not located at the runway (RWY) threshold:**

DO NOT USE vertical managed guidance (FINAL APP)

USE NAV mode for lateral guidance

USE SELECTED vertical guidance mode only (FPA is recommended)

DISREGARD the VDEV symbol, and crosscheck the final descent using altitude versus distance to the MAP.

Note: Approaches labelled as "GPS" on the MCDU can be flown in FINAL APP mode, regardless of the MAP position.

#### FOR LOC, OR LOC BACK COURSE (B/C) APPROACHES

CHECK the position of the MAP on the approach chart

■ **If the MAP is located at the runway (RWY) threshold:**

VDEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode.

■ **If the MAP is located before the runway (RWY) threshold:**

DISREGARD the VDEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

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## OEB36 Issue 1.0

### NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 199.

One operator reported a case where, at takeoff, the Speed Reference System (SRS) mode did not engage, as expected while setting takeoff thrust. The aircraft was dispatched in N1 rated control mode (EPR control mode inoperative).

Investigation has shown that similar misbehavior also applies in the case of go-around with EPR control mode inoperative.

This OEB is issued to provide flight crews with an operational procedure in the case of a go-around with EPR control mode inoperative (EPR control mode failure in flight).

**Applicable to:**

All A320 family aircraft fitted with IAE engines and Flight Guidance (FG) "I9" (Thales/GE, MOD 34076) "I10" (Honeywell, MOD 35526) standard and subsequent.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		36.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013569.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HTI					
	OEBPROC-36		No SRS Engagement During Go Around in the Case of EPR Mode Fault	00013570.0003001	30 MAR 12
Criteria: 22-1203, IAE, P8015, P8486, P9126 Applicable to: B-HTI					





## NO SRS ENGAGEMENT DURING GO AROUND IN THE CASE OF EPR MODE FAULT

### **ECAM ENTRY**

ENG 1(2) EPR MODE FAULT

### **PROCEDURE**

In the case of go-around with EPR control mode inoperative, perform a manual go-around with no FD:

Maximum landing capability is CAT 1.

Note: To perform a manual go-around with no FD, the PF simultaneously announces her/his intention, disengages the AP, applies TOGA and initiates the rotation.

GO-AROUND..... ANNOUNCE

AP (if engaged)..... OFF

BOTH FDs (if engaged)..... OFF

*Action performed by the PNF on PF request.*

THRUST LEVERS..... TOGA

ROTATION..... 15 ° OF PITCH

*Rotate to 12.5 ° in case of engine failure.*

FLAPS..... RETRACT ONE STEP

POSITIVE CLIMB..... ANNOUNCE

LDG GEAR UP..... ORDER

LDG GEAR..... SELECT UP

Adjust pitch to maintain VAPP

- **When appropriate:**

Set both FDs to ON (basic guidance modes engage)

Engage OP CLB and select appropriate speed and lateral mode

AP use as required

- **When reaching thrust reduction altitude:**

Set both thrust levers to CL detent

- **When reaching acceleration altitude:**

Resume normal acceleration and climb procedures.

Note: CLB or LVR CLB will not flash on the FMA as the A/THR is not available. The FMS does not engage the GO AROUND phase.

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## OEB38 Issue 1.0

# ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the safe operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is strongly recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they are available.

**Reason for issue:**

This OEB replaces the A320 OEB 201

In follow-up to questions received from several Operators, the objective of this OEB is to remind Operators of the possible operational consequences of an erroneous Radio Altimeter (RA) height indication:

In addition this OEB is issued to:

- Highlight that during ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react to prevent the angle-of-attack from increasing.
- Provide explanation of erroneous RA height indication effects on Auto Flight System (AFS) and flight control law.

**Applicable to:**

All A318/A319/A320/A321 operators

**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013578.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTI				
	OEBPROC-38		Erroneous Radio Altimeter Height Indication	00013579.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTI				



## ERRONEOUS RADIO ALTIMETER HEIGHT INDICATION

### ECAM ENTRY

None

### PROCEDURE

This bulletin is issued to remind operators of the possible consequences of an erroneous Radio Altimeter (RA) height indication. Erroneous RA height indication may have on aircraft systems, any of the effects listed in the OEB N°38.

This OEB PROC is issued to provide flight crews with the following recommendations:

During all phases of flight, flight crew must monitor and crosscheck all primary flight parameters and the FMA.

During ILS (or MLS, GLS) approach with AP engaged, in the event of an unexpected early THR IDLE and FLARE modes engagement, the flight crew must immediately react as follows:

- **Immediately** perform an automatic Go-Around (Thrust Levers set to TOGA),  
**OR**
- **Immediately** disconnect the AP,
  - Then continue the landing using raw data or visual references (FDs set to OFF),  
**OR**
  - Perform a manual Go-Around (Thrust Levers set to TOGA). Significant longitudinal sidestick input may be required.

Note: 1. If the flight crew does not immediately react, the angle-of-attack will increase and may reach the stall value.  
2. In case of Go-Around and if the RA is still frozen at a very low height indication:

- SRS and GA TRK modes engage
- NAV, HDG or TRK lateral modes cannot be selected
- LVR CLB will not be displayed on the FMA at THR RED ALT
- ALT\* and ALT will not engage at FCU altitude

Disconnecting AP and resetting both FDs enable to recover basic modes (HDG and V/S).

3. In CONF FULL, the auto-trim function is inhibited. Retracting one step enable to recover the auto-trim function.

For all the others events that may occur during approach, there is no change in the procedures or in the recommended flight crew reactions.

Flight crews must report in the aircraft technical logbook if any of the consequences on aircraft systems listed in the OEB N°38.

\*\*\*\*\* END OF RED OEB38 ISSUE 1.0 \*\*\*\*\*

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## OEB40 Issue 1.0

### AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

Approved by: Head of Flight Operations Support and Services

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 203.

Subsequent to several dual bleed loss cases reported by Operators, Airbus decided to develop different technical solutions to improve the robustness of the bleed system. These technical solutions, although significantly reducing the number of dual bleed loss occurrences, cannot fully avoid such occurrences. Therefore, this OEB is published in order to provide all SA Operators with operational procedures aiming at further reducing the number of dual bleed loss occurrences, whatever the bleed system solution installed.

**Applicable to:**

All A320 family aircraft.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

Operations Engineering Bulletins are issued by Airbus as the need arises to quickly transmit technical and procedural information. They are distributed to all FCOM holders and to others who need advice of changes to operational information.

Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013605.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTI				
	OEBPROC-40		AIR ENG 1(2) BLEED ABNORMAL PR or AIR ENG 1(2) BLEED FAULT	00013606.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTI				





## AIR ENG 1(2) BLEED ABNORMAL PR OR AIR ENG 1(2) BLEED FAULT

### ECAM ENTRY

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

### PROCEDURE

Apply the corresponding procedures if one of the following ECAM caution is triggered:

- AIR ENG 1(2) BLEED ABNORMAL PR
- AIR ENG 1(2) BLEED FAULT

#### AIR ENG 1(2) BLEED ABNORMAL PR

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED page.....SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

##### ■ If Wing Anti-Ice is ON

##### ● If both PACKS are ON

PACK (affected bleed side).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

##### ● If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:

BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

#### AIR ENG 1(2) BLEED FAULT

ENG BLEED affected..... OFF

##### ■ If Wing Anti-Ice is OFF

PACK FLOW..... LO (A319/A320)  
ECON FLOW.....ON (A321)  
AFT CARGO HOT AIR (if installed).....OFF  
X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR



**AIR ENG 1(2) BLEED ABNORMAL PR  
OR AIR ENG 1(2) BLEED FAULT (Cont'd)**

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
PACK (on the first affected bleed side)..... OFF

*Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.*

■ If Wing Anti-Ice is ON

- If both PACKS are ON  
PACK (affected bleed side).....OFF

X BLEED..... OPEN  
BLEED Page..... SELECT and MONITOR

- If the precooler outlet temperature of the remaining bleed exceeds 240 °C within 2 min after X BLEED valve opening:  
BLEED AIR DEMAND.....REDUCE

*Consider reducing the bleed air demand, by, depending on the flight conditions:*

- Switching OFF the remaining pack (if aircraft's altitude permits), or
- Switching OFF the Wing Anti-Ice system (if no longer icing conditions).

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## OEB43 Issue 2.0

### F/CTL SPOILER FAULT

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 208.

- Several cases of spoiler runaway occurring in flight have been reported. During these events, the failed spoiler remained in the full deflected position for the remaining of the flight. The purpose of this OEB is to inform operators about the operational impact of such a failure and to provide the associated operational procedure.
- Following flight test , this OEB PROC is revised to modify the procedure.

**Applicable to:**

All A318/A319/A320/A321 Aircrafts.


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-43		F/CTL SPOILER FAULT	00013701.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTI				
	OEBPROC-43		F/CTL SPOILER FAULT	00013702.0001001	20 SEP 11
	Criteria: SA Applicable to: B-HTI				



## F/CTL SPOILER FAULT

### ECAM ENTRY

F/CTL SPLR FAULT

### PROCEDURE

- If **F/CTL SPLR FAULT** is triggered

F/CTL S/D page.....CHECK

*The flight crew should check the spoiler position on the F/CTL System Display page.*

- If all amber spoilers are indicated retracted:

*Loss of one or more spoilers in the retracted position. In such a case, the flight crew must apply the following operational procedure that reflects the F/CTL SPLR FAULT ECAM caution.*

#### F/CTL SPLR FAULT

*Note: If heavy vibrations are felt, CONF3 may be used for landing in order to reduce the buffeting.*

- SPD BRK (if spoilers 3 + 4 affected).....DO NOT USE  
*Do not use speedbrakes, since using only surfaces N°2 is not efficient and would activate the SPD BRK DISAGREE caution.*

#### STATUS

- If spoilers 3+4 affected

- SPD BRK.....DO NOT USE  
LDG DIST PROC.....APPLY

INOP SYS  
SPLR(affected)  
SPD BRK (if  
spoilers 2+3+4  
affected)

- If at least one spoiler is indicated deflected in amber, apply the following procedure:

#### F/CTLSPLR FAULT

AP.....OFF

*Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.*

SPEED.....GDOT+10

*Whenever possible, target green dot speed +10 kt to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.*

CRUISE ALTITUDE.....AS REQUIRED

*Current Flight Level (FL) may not be maintained due to increased drag. Maintain a cruise FL as high as possible.*

FUEL CONSUMPTION INCREASED

FMS FUEL PRED.....DISREGARD

FUEL CONSUMPTION.....DETERMINE



F/CTL SPOILER FAULT (Cont'd)

DIVERSION..... CONSIDER

**APPR PROC**

In clean configuration, if VLS is above VFE<sub>NEXT</sub>, the flight crew should deselect A/THR, decelerate to VFE<sub>NEXT</sub>, and select CONF 1 when below VFE<sub>NEXT</sub>. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FOR LDG.....USE FLAP 3

GPWS LDG FLAP 3..... ON

APPR SPD.....VREF + 10KT

LDG DIST Factor without reversers.....x 1.4

LDG DIST Factors with reversers..... x 1.35

*The flight crew must apply the corresponding factor on the actual landing distance corresponding to the runway condition.*

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## OEB44 Issue 2.0

# L/G GEAR NOT DOWNLOCKED

- This OEB covers a significant operational issue. Non-compliance with this OEB should have a significant impact on the operations of the aircraft. The Operators shall distribute its content to all flight crews without delay. An extract of this OEB is provided for insertion in the QRH.
- It is recommended that all Operators accelerate the incorporation of all corrective Service Bulletins as soon as they become available.

**Reason for issue:**

This OEB replaces the A320 OEB 209.

This OEB is issued to provide operational recommendations in the case of L/G GEAR NOT DOWNLOCKED ECAM warning.

The illustration has been revised to improve the quality and the legibility.

**Applicable to:**

All A320 family aircraft


**Cancelled by:**

Refer to the "Cancelled by" section of the associated FCOM OEB.

*Note: The interchangeability code, given in the Illustrated Part Catalog (IPC), indicates the conditions for interchangeability of equipment. After installation of corrective modification(s)/SB(s), if an Operator reinstalls any equipment affected by this OEB, it is the Operator's responsibility to ensure that the recommendations given in this OEB are applied again for the applicable aircraft.*

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Information in this bulletin is recommended by Airbus but may not be approved by Airworthiness Authorities. If the procedures contained in this OEB differ from the procedures in the AFM, the AFM remains the reference.

<div> DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK</div>			OPERATIONS ENGINEERING BULLETINS		44.00A
					30 MAR 12
M	Localization	T	DU Title	DU identification	DU date
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013699.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTI				
	OEBPROC-44		L/G GEAR NOT DOWNLOCKED	00013700.0001001	30 MAR 12
	Criteria: SA Applicable to: B-HTI				





## L/G GEAR NOT DOWNLOCKED

### ECAM ENTRY

L/G GEAR NOT DOWNLOCKED

### PROCEDURE

Apply the following procedure if the ECAM triggers the L/G GEAR NOT DOWNLOCKED warning:

#### L/G GEAR NOT DOWNLOCKED

*This warning appears, if the landing gear sequence is not completed after 30 seconds.*

L/G lever.....RECYCLE

•IF GEAR NOT DOWNLOCKED AFTER 2 MINUTES:

L/G GRAVITY EXTENSION PROC.....APPLY

STATUS

The status displayed on the ECAM is correct.

 DRAGONAIR <b>A320/A321</b> QUICK REFERENCE HAND BOOK	OPERATIONS ENGINEERING BULLETINS	BLANK
		30 MAR 12

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