

Flight Crew Operating Manual



FCOM

A320
QRH

Customer Services


AIRBUS

QUICK REFERENCE HAND BOOK

A318/A319/A320/A321

AIRBUS TRAINING



 **AIRBUS®**

SUBJECT : CDSS SMOKE FROM LCD MONITOR.

REASON FOR ISSUE :

A case of burning smell/smoke emanations, caused by a failure of the Cockpit Door Surveillance System (CDSS) LCD monitor (short-circuit) was reported to Airbus. In such a case, smoke emanating from the LCD can be stopped by de-activating the CDSS.

This Temporary Revision is issued to inform operators that, if smoke and/or burning smell is detected, it may come from the LCD monitor. If such is the case, and as specified in the SMOKE procedure, the faulty equipment must be isolated (by switching OFF the CKPIT DOOR VIDEO pushbutton).

VALIDITY : All A320 aircraft equipped with the Video Surveillance System, associated with the reinforced cockpit door (CDSS).

FILING INSTRUCTIONS :

Insert the following pages :

TR N° 398-1 page 1 of 2, in front of the first divider of the QRH.
TR N° 398-1 page 2 of 2, facing QRH 1.08.

This Temporary Revision has been issued after normal revision N° 37.
Do not remove it until instructed to do so.

SUBJECT : C/B RESET PROC FOR ACSC

REASON FOR ISSUE :

This Temporary Revision is issued for aircraft with the Air Conditioning System Controller 1803B0000-02, in order to provide Operators with the ACSC C/B reset procedure to apply in the case of a "PACK REGUL FAULT" triggered on ground.

VALIDITY :

Aircraft with the Air Conditioning System Controller 1803B0000-02 (Mod 35863).

FILING INSTRUCTIONS :

Update the Record of Temporary Revisions, and insert the following pages :

TR N° 521-1, page 1 of 2, in front of the first divider of the QRH.

TR N° 521-1, page 2 of 2, facing QRH 2.36.

This Temporary Revision has been issued after normal revision N° 39.
Do not remove it until instructed to do so.

AIRBUS TRAINING  A320 SIMULATOR	TEMPORARY REVISION N° 604-1	APR 08 ISS.A	0.0
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TR N° 604-1 PAGE 1 OF 2

SUBJECT : Improvement of the CIDS reset procedure following an uncommanded EVAC horn activation.

REASON FOR ISSUE :

This Temporary Revision is issued in order to provide Operators with an enhanced CIDS reset procedure in the case of an uncommanded EVAC horn activation.

VALIDITY :

A319/A320 aircraft that have a modified CIDS power supply (mod 24771) or, A318/A319/A320 aircraft that have an enhanced CIDS (mod 33100 and 33300).

FILING INSTRUCTIONS :

Update the Record of Temporary Revisions, and insert the following pages :

TR N° 604-1 Page 1 of 2, in front of the first divider of the QRH.
TR N° 604-1 Page 2 of 2, facing 2.37.

This Temporary Revision has been issued after normal revision N° 41.
Do not remove it until instructed to do so.

SUBJECT : AUTOPILOT (AP) – MINIMUM EQUIPMENT IN CAT II/CAT III

REASON FOR ISSUE :

This Temporary Revision is issued to provide Operators with the updated required equipment list for CAT II and CAT III landing operations.

The Flight Director (FD) is not required for CAT II and CAT III landing operations.

The loss of landing capabilities is related to the loss of the AP, and not to the loss of the FD.

As a result, the FD information was removed from the first line of the required equipment list that takes into account the AP.

VALIDITY :

All A320 family aircraft.

FILING INSTRUCTIONS :

Update the Record of Temporary Revisions, and insert the following pages :

TR N° 608-1 page 1 of 2, in front of the first divider of the QRH.

TR N° 608-1 page 2 of 2, facing 5.04.

This Temporary Revision has been issued after normal revision N° 42.
Do not remove it until instructed to do so.

SUBJECT :

LGCIU reset procedure.

REASON FOR ISSUE :

This Temporary Revision (TR) is issued to update the LGCIU reset procedure on ground. The new procedure aims to prevent any retraction of the landing gear, when the aircraft is on ground during the LGCIU reset. Therefore, in accordance with the procedure, there should be no more pressure in the green hydraulic system before any LGCIU reset.

VALIDITY : All A318/A319/A320/A321 aircraft

FILING INSTRUCTIONS :

Update the Record of Temporary Revisions, and insert the following pages :

TR N° 609-1, Page 1 of 2, in front of the first divider of the QRH.
TR N° 609-1, Page 2 of 2, facing 2.39.

This Temporary Revision has been issued after normal revision N° 42.
Do not remove it until instructed to do so.

SUBJECT :

WINDSHEAR AHEAD

REASON FOR ISSUE :

This Temporary Revision is issued to avoid duplication of the go-around procedure in the WINDSHEAR AHEAD procedure : The action lines related to the go-around are removed, and a reference to the GO-AROUND procedure is added.

VALIDITY :

Aircraft that have the Predictive Windshear function.

FILING INSTRUCTIONS :

Update the Record of Temporary Revisions, and insert the following pages :

TR N° 614-1 page 1 of 2, in front of the first divider of the QRH.
TR N° 614-1 page 2 of 2, facing 1.27

This Temporary Revision has been issued after normal revision N° 42.
Do not remove it until instructed to do so.

SUBJECT : QRH Normal Procedures – Part 1

REASON FOR ISSUE :

In the last revision of the FCOM VOL3 / QRH (REV 42), it was decided to remove all callouts from the different sections of the SOP, and to replace them by action lines.

Example :

is now replaced by :

- FLAPS 1 SELECT

However, this change does not reflect anymore the fact that the PF requests the selection of the flaps/slats and the landing gear before the PNF performs the action.

This Temporary Revision is issued in order to clarify that the Standard Operating Procedures and the task sharing remain unchanged : The PF orders a slats/flaps configuration change (or the landing gear retraction/extension), and then, the PNF performs the corresponding action.

Therefore for the same example the QRH is revised as follows :

- FLAPS 1 ORDER | – FLAPS 1 SELECT

VALIDITY : A318/A319/A320/A321 aircraft with :

- The fully electrical braking system (Mod 26925), and
 - The modification(s) that prevent(s) Nose-Wheel Steering reconnection during pushback (Mod 35216 or 35249 or 36368 or 36853 or 36994)

FILING INSTRUCTIONS :

Update the Record of Temporary Revisions and insert the following pages :

TR N° 630-1 page 1 of 4, in front of the first divider of the QRH.

TR N° 630-1 page 2 of 4, facing 3.04.

TR N° 630-1 page 3 of 4, facing 3.05.

TR N° 630-1 page 4 of 4, facing 3.10.

This Temporary Revision has been issued after normal revision N° 42.
Do not remove it until instructed to do so.

SUBJECT : QRH Normal Procedures – Part 2

REASON FOR ISSUE :

In the last revision of the FCOM VOL3 / QRH (REV 42), it was decided to remove all callouts from the different sections of the SOP, and to replace them by action lines.

Example :

is now replaced by :

- FLAPS 1 SELECT

However, this change does not reflect anymore the fact that the PF requests the selection of the flaps/slats and the landing gear before the PNF performs the action.

This Temporary Revision is issued in order to clarify that the Standard Operating Procedures and the task sharing remain unchanged : The PF orders a slats/flaps configuration change (or the landing gear retraction/extension), and then, the PNF performs the corresponding action.

Therefore for the same example the QRH is revised as follows :

- FLAPS 1 ORDER | – FLAPS 1 SELECT

VALIDITY : A318/A319/A320 aircraft

FILING INSTRUCTIONS :

Update the Record of Temporary Revisions and insert the following pages :

TR N° 631-1 page 1 of 4, in front of the first divider of the QRH.

TR N° 631-1 page 2 of 4, facing 3.07.

TR N° 631-1 page 3 of 4, facing 3.08.

TR N° 631-1 page 4 of 4, facing 3.09.

This Temporary Revision has been issued after normal revision N° 42.
Do not remove it until instructed to do so.

IMPORTANT

SCOPE

The QRH contains some specific procedures which are not displayed on the ECAM.

As a general rule, the procedures displayed on the ECAM are not provided in the QRH (refer to FCOM 3.02).

TASKSHARING FOR ABN/EMER PROC

For all abnormal/emergency procedures, the tasksharing is as follows :

R PF – Pilot flying – Responsible for the :

- Thrust levers
- Flight path and airspeed control
- Aircraft configuration (request configuration change)
- Navigation
- Communications

R PNF – Pilot non flying – Responsible for the :

- Monitoring and reading aloud the ECAM and checklists
- Performing required actions or actions requested by the PF, if applicable
- Using engine master switches, IR and guarded switches with PF's confirmation.

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 feet above the runway, if a failure occurs during takeoff, approach, or go-around. (In some emergency cases, provided the appropriate flight path is established, the pilot flying may initiate actions before this height).

NORMAL CHECKLIST

Normal C/L are initiated by the PF and read by the PNF.

The PF shall respond after having checked the existing configuration. When both pilots have to respond, "BOTH" is indicated.

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 Not Flying (PNF) refer to the corresponding QRH summary.

R When a failure occurs, and after performing the ECAM actions, the PNF 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.

R For dry and wet runways, the actual landing distance with failure is provided in the QRH. This actual landing distance is based on the following assumptions :

R – The approach speed is $V_{REF} + \Delta V_{REF}$ (refer to the "CRUISE" section of the Summary). The speed increment (when applicable), and corresponding landing distance penalty that are required when the A/THR is used, or in the case of ice accretion on surfaces that are not heated, is not taken into account.

R – The flight crew uses maximum reverse thrust on all operative reversers for wet runways.

R For contaminated runways, the landing distance factor that the PNF must apply to the actual landing distance with reverser, is also provided in the QRH. The PNF must refer to the applicable QRH page 4.03 and calculate the landing distance, taking into account the failure.

R Depending on the actual landing distance with failure, the PNF 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 PNF should refer to the "CRUISE" portion of the summary, to determine the V_{REF} correction, and **compute the VAPP**.

A V_{REF} table is provided in the summary, for failure cases leading to the loss of the MCDU.

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

APPROACH

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

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

MAIN QRH CHANGES

For information related to the main QRH changes, refer to the "GENERAL INFORMATION" chapter in FCOM Volume 3 3.00.10.

CODE	DESIGNATION
0001	Mod : $(24215 + 32090) = (24588 + 32090) = (25534 + 32090) = (24215 + 24588 + 32090) = (24215 + 28160 + 28917 + 32090) = (24588 + 28160 + 28917 + 32090) = (24215 + 24588 + 28917 + 32090) = (24215 + 24588 + 28160 + 28917 + 32090)$
0002	Mod : $20268 = (20268 + 25800)$
0003	Mod : $(22013 + 24215 + 32090) = (22013 + 24588 + 32090) = (22013 + 25534 + 32090) = (24105 + 24588 + 32090) = (24105 + 24215 + 32090) = (24105 + 25534 + 32090) = (28160 + 24215 + 32090) = (28160 + 24588 + 32090) = (28160 + 25534 + 32090) = (22013 + 24215 + 24588 + 32090) = (24105 + 24215 + 24588 + 32090) = (24215 + 24588 + 28160 + 32090)$
0004	Mod : $(24215 + 32090 + 32499) = (24588 + 32090 + 32499) = (25534 + 32090 + 32499) = (24215 + 24588 + 32090 + 32499) = (24215 + 25534 + 32090 + 32499) = (24215 + 28160 + 28917 + 32090 + 32499) = (25534 + 28160 + 28917 + 32090 + 32499) = (24588 + 28160 + 28917 + 32090 + 32499) = (24215 + 24588 + 25534 + 32090 + 32499)$
0005	Mod : $(20268 + 28342) = (20268 + 28342 + 31106)$
0006	Mod : $(20268 + 24946 + 26965) = (20268 + 24946 + 27773) = (20268 + 25951 + 26965) = (20268 + 25951 + 27773) = (20268 + 26760 + 26965) = (20268 + 26760 + 27773) = (20268 + 26965 + 32150) = (20268 + 26965 + 32238) = (20268 + 26965 + 32239) = (20268 + 26965 + 32311) = (20268 + 27773 + 32150) = (20268 + 27773 + 32238) = (20268 + 27773 + 32239) = (20268 + 27773 + 32311) = (20268 + 31106 + 32238) = (20139 + 20268 + 22129 + 24946 + 27773 + 31106)$
0007	Mod: $(20268 + 25647 + 26965) = (20268 + 25647 + 31106) = (\text{ACA} + 20268 + 25647 + 31106)$
0008	Mod : $(20059 + 20343) = (20059 + 31276) = (31276 + 35236) = (20059 + 20343 + 31276)$
0009	Mod : $(20268 + 25225)$
0010	Mod : $(22013 + 24215 + 32090 + 32499) = (22013 + 24588 + 32090 + 32499) = (22013 + 25534 + 32090 + 32499) = (24105 + 24215 + 32090 + 32499) = (24105 + 24588 + 32090 + 32499) = (24105 + 25534 + 32090 + 32499) = (28160 + 24215 + 32090 + 32499) = (28160 + 24588 + 32090 + 32499) = (28160 + 25534 + 32090 + 32499) = (22013 + 24215 + 24588 + 32090 + 32499) = (24105 + 24215 + 24588 + 32090 + 32499) = (24215 + 24588 + 28160 + 32090 + 32499)$
0011	Mod : $(32090 + 32499) = (25534 + 32090 + 32499) = (24215 + 32090 + 32499) = (24588 + 32090 + 32499) = (28160 + 28917 + 32090 + 32499) = (24215 + 24588 + 32090 + 32499) = (24215 + 24215 + 32090 + 32499) = (24215 + 24588 + 28160 + 28917 + 32090 + 32499) = (24588 + 28160 + 28917 + 32090 + 32499) = (25534 + 28160 + 28917 + 32090 + 32499) = (24215 + 24588 + 25534 + 32090 + 32499)$
0012	Mod : $(22013 + 24215 + 32090 + 32499) = (22013 + 24588 + 32090 + 32499) = (22013 + 25534 + 32090 + 32499) = (24105 + 24215 + 32090 + 32499) = (24105 + 24588 + 32090 + 32499) = (24105 + 25534 + 32090 + 32499) = (28160 + 24215 + 32090 + 32499) = (28160 + 24588 + 32090 + 32499) = (28160 + 25534 + 32090 + 32499) = (22013 + 24215 + 24588 + 32090 + 32499) = (24105 + 24215 + 24588 + 32090 + 32499) = (24215 + 24588 + 28160 + 32090 + 32499)$

CODE	DESIGNATION
0013	Mod : $(20268+36311) = (20268+36297) = (20268+36885) =$ $(20268+24946+26965+36311) = (20268+24946+27773+36311) =$ $(20268+25951+26965+36311) = (20268+25951+27773+36311) =$ $(20268+26760+26965+36311) = (20268+26760+27773+36311) =$ $(20268+26965+32150+36311) = (20268+26965+32238+36311) =$ $(20268+26965+32239+36311) = (20268+26965+32311+36311) =$ $(20268+27773+32150+36311) = (20268+27773+32238+36311) =$ $(20268+27773+32239+36311) = (20268+27773+32311+36311) =$ $(20268+26965+35040+36311) = (20268+27773+35040+36311) =$ $(20268+24946+26965+36297) = (20268+24946+27773+36297) =$ $(20268+25951+26965+36297) = (20268+25951+27773+36297) =$ $(20268+26760+26965+36297) = (20268+26760+27773+36297) =$ $(20268+26965+32150+36297) = (20268+26965+32238+36297) =$ $(20268+27773+32150+36297) = (20268+27773+32238+36297) =$ $(20268+27773+32239+36297) = (20268+27773+32311+36297) =$ $(20268+26965+35040+36297) = (20268+27773+35040+36297) =$ $(20268+24946+26965+36885) = (20268+24946+27773+36885) =$ $(20268+25951+26965+36885) = (20268+25951+27773+36885) =$ $(20268+26760+26965+36885) = (20268+26760+27773+36885) =$ $(20268+26965+32150+36885) = (20268+26965+32238+36885) =$ $(20268+26965+32239+36885) = (20268+26965+32311+36885) =$ $(20268+26965+35040+36885) = (20268+27773+35040+36885) =$ $(20268+26965+35040+36885) = (20268+27773+35040+36885)$
R 0014	Mod: $(20268) = (20268+20139+22129)$
0015	Mod : $(24105+24215+24588+24794+28238)$
0016	Mod: $(20268+28342) = (20268+28342+27773)$
0017	Mod : $(36311+31896) = (36311+32475) = (36885+31896) =$ $(36885+32475) = (36297+31896) = (36297+32475) =$ $(36311+31896+32332+32475) = (36885+31896+32332+32476) =$ $(36297+31896+32332+32475)$
0018	Mod : $(20268+36311) = (20268+36297) = (20268+36885) =$ $(20268+25800+36311) = (20268+25800+36297) =$ $(20268+25800+36885) = (20268+25530+26505+36311) =$ $(20268+25530+26505+36297) = (20268+25530+26505+36885) =$ $(20268+25800+25530+26505+36311) =$ $(20268+25800+25530+26505+36297) =$ $(20268+25800+25530+26505+36885)$
0019	Mod : $20268 = (20268+25800)$
0020	Mod : $(20268+25530) = (20268+25530+25800) = (20268+25800+27727) =$ $(20268+25530+25800+27727)$
0021	Mod : $(20268+24404) = (20268+24404+25800) = (20268+25800+27727) =$ $(20268+24404+25800+27727)$
0022	Mod : $20268 = (20268+25800) = (20268+24404+25502) =$ $(20268+24404+25502+25800)$
0023	Mod : $(20268+24405) = (20268+24405+25800) = (20268+25800+27727) =$ $(20268+24405+25800+27727)$
0024	Mod : $20268 = (20268+25800) = (20268+24405+25501) =$ $(20268+24405+25501+25800)$
0025	Mod: $(20268+25647+26965) = (20268+25647+31106) =$ $(20268+25647+31106+32311)$
0026	Mod : $(36310+20268) = (20268+25800+36310)$
0027	Mod: $20268 = (20268+21678+25404+26965) =$ $(20268+21678+25404+31106)$
0028	Mod : $(24105+25529+30206) = (24105+25529+36136)$
0029	Mod : $20268 = (20268+25647+ACA)$
R 0030	Mod: $(20268+21678+25404+25647) =$ $(20268+21678+25404+26965+27773+31106+32311+35040/MXA)$
0031	Mod: $(20268+21678) = (20268+21678+20139+22129)$

CODE	DESIGNATION
0032	$\begin{aligned} \text{Mod: } (20268+24946+26965) &= (20268+24946+27773) = \\ (20268+25951+26965) &= (20268+25951+27773) = (20268+26760+26965) \\ &= (20268+26760+27773) = (20268+26965+32150) = \\ (20268+26965+32238) &= (20268+26965+32239) = (20268+26965+32311) \\ &= (20268+27773+32150) = (20268+27773+32238) = \\ (20268+27773+32239) &= (20268+27773+32311) = (20268+24946+31106) \end{aligned}$
0033	$\begin{aligned} \text{Mod : } (20268+21678+24946+27773) &= (20268+21678+27773+32238) = \\ (20268+21678+25951+31106) &= (20268+21678+31106+32311) = \\ (20268+21678+24946+31106) & \end{aligned}$
0034	$\begin{aligned} \text{Mod: } (20268+21678+24946+26965) &= (20268+21678+24946+27773) = \\ (20268+21678+25951+26965) &= (20268+21678+25951+27773) = \\ (20268+21678+26760+26965) &= (20268+21678+26760+27773) = \\ (20268+21678+26965+32150) &= (20268+21678+26965+32238) = \\ (20268+21678+26965+32239) &= (20268+21678+26965+32311) = \\ (20268+21678+27773+32150) &= (20268+21678+27773+32238) = \\ (20268+21678+27773+32239) &= (20268+21678+27773+32311) = \\ (20268+21678+31106+32238) &= \\ (20139+20268+21678+22129+24946+27773+31106) & \end{aligned}$
0035	$\text{Mod : } (20268+28238) = (20268+25800+28238)$
0036	$\text{Mod : } 20268 = (20268+25225+28399)+\text{IAE } V2500 = V2527 = V2527E$
0037	$\begin{aligned} \text{Mod : } (24105+25529+30020) &= (24105+26270+30020) = \\ (24105+25819+30020) &= (24105+26117+30020) = \\ (24105+25819+26270+30020) &= (24105+25529+25919+30020) \end{aligned}$
0038	$\begin{aligned} \text{Mod : } (20268+21678+24946+25404+27773) &= \\ (20268+21678+24946+25404+31106) &= \\ (20268+21678+25404+25951+31106) &= \\ (20268+21678+25404+31106+32311) &= \\ (20268+21678+25404+31106+32238) &= \\ (20268+21678+24946+25404+27773+28160+28917) & \end{aligned}$
0039	$\text{Mod : STD} = (26999+28495)$
0040	$\text{Mod : } (20063+22562+31495) = (20063+31495+35864) = \\ (20063+22562+31495+35864)$
0041	$\begin{aligned} \text{Mod : } (20151+22562+31495) &= (22562+23092+31495) = \\ (22562+31112+31495) &= (20063+20151+22562+31495) = \\ (20063+22562+31112+31495) &= (20063+20151+31495+35864) = \\ (20063+31112+31495+35864) &= \\ (20063+22562+31112+31495+35864) &= \\ (20063+20151+31495+22562+35864) & \end{aligned}$
0042	$\begin{aligned} \text{Mod : } (20268+21678+25404+26760+27773) &= \\ (20268+21678+24946+25404+27773) &= \\ (20268+21678+25404+31106+32238) &= \\ (20268+21678+25404+31106+32239) &= \\ (20268+21678+25404+31106+32311) &= \\ (20268+21678+24946+25404+27773+28160+28917) & \end{aligned}$
0043	$\text{Mod : } 30020 = (24105+30020) = (26999+28495+30020) = \\ (26999+28495+24105+30020)$
R	$\text{Mod : } (20268/A1/A3/B4) = (20268+36297/B5) = (20268+36311/B6)$
R	$\text{STD} = \text{Mod : } (33100+34856) = (33100+34898) = (33100+34997)$
0048	$\begin{aligned} \text{Mod : } (23885+30020) &= (25205+30020) = (26485+30020) = \\ (26999+30020) &= (28382+30020) = (30241+30020) = \\ (30631+30020) &= (23885+24105+30020) = (25205+24105+30020) \\ &= (26485+24105+30020) = (26999+24105+30020) = \\ (28382+24105+30020) &= (30241+24105+30020) = \\ (30631+24105+30020) &= (25205+26999+28495+30020) = \\ (26999+28382+28495+30020) &= \\ (25205+26999+28495+24105+30020) &= \\ (26999+28382+28495+24105+30020) & \end{aligned}$
0049	$\begin{aligned} \text{Mod : } (25205+34041) &= (23885+34041) = (26999+34041) = \\ (28382+34041) &= (26485+34041) = (30631+34041) = \\ (30241+34041) &= (26999+28382+28495+34041) = \\ (25205+26999+28495+34041) & \end{aligned}$
0050	$\text{Mod : } (34637+35353) = (26526+34637+35353)$

CODE	DESIGNATION
0051	Mod : $(36847 + 56-5-B4) = (36311 + 36847 + 56-5-B6) = (28160 + 28917 + 36847 + 56-5-B4) = (28160 + 28917 + 36311 + 36847 + 56-5-B6)$
0052	Mod : $(36847 + 56-5-A1/A3/V2500A1/V2527/V2527E) = (28160 + 28917 + 36847 + 56-5-A1/A3/V2500A1/V2527/V2527E)$
0054	Mod : $(36847 + 28160 + 56-5-A1/A3/V2500/V2527/V2527E)$
0055	Mod : $(36847 + 56-5-A4/A5/B5/B6/B7/V2522/V2524/V2527M)$
0056	Mod : $(36847 + 56-5-A1/A3/B4) = (36311 + 36847 + 56-5-B6)$
0057	Mod : $20268 = (20268 + 25225 + 28399)$
0058	Mod : $(20343 + 36847 + 56-5-A4/A5/B5/B6/B7/V2522/V2524/V2527M) = (27498 + 31276 + 36847 + 56-5-A4/A5/B5/B6/B7/V2522/V2524/V2527M)$
R 0061	Mod : $(36847 + 56-5-B5/B6/B7/B8/B9/PW) = (28160 + 36847 + 56-5-B4)$
	Mod : $(20343 + 36847 + 56-5-A4/A5/B5/B6/B7/V2522/V2524/V2527M) = (31276 + 36847 + 56-5-A4/A5/B5/B6/B7/V2522/V2524/V2527M) = (20243 + 27498 + 36847 + 56-5-A4/A5/B5/B6/B7/V2522/V2524/V2527M) = (27498 + 31276 + 36847 + 56-5-A4/A5/B5/B6/B7/V2522/V2524/V2527M)$
0062	Mod : $(20343 + 36847) = (31276 + 36847) = (20243 + 27498 + 36847) = (27498 + 31276 + 36847)$
0063	Mod : $(20343 + 36847) = (31276 + 36847) = (20243 + 27498 + 36847) = (27498 + 31276 + 36847)$
0064	Mod : $(24105 + 25529 + 30020) = (24105 + 26270 + 30020) = (24105 + 25819 + 30020) = (24105 + 26117 + 30020) = (24105 + 25819 + 26270 + 30020)$
0065	Mod : $(22013 + 36847 + 56-5-B1/B2/B3/V2530/V2533)$
0066	Mod : $(27498 + 36847 + 56-5-A4/A5/B5/B6/B7/V2522/V2524/V2527M)$
0067	Mod : $(20343 + 36847 + 56-5-A1/A3/B4) = (31276 + 36847 + 56-5-A1/A3/B4) = (27498 + 31276 + 36847 + 56-5-A1/A3/B4) = (20343 + 27498 + 36847 + 56-5-A1/A3/B4) = (20243 + 36311 + 36847/B6) = (31276 + 36311 + 36847/B6) = (27498 + 20243 + 36311 + 36847/B6) = (27498 + 31276 + 36311 + 36847/B6)$
R 0069	Mod : $(20343 + 36847 + 56-5-A1/A3/B4) = (27498 + 31276 + 36847 + 56-5-A1/A3/B4) = (20243 + 36311 + 36847/B6) = (27498 + 31276 + 36311 + 36847/B6)$
	Mod : $(32475 + 37999) = (32929 + 37999) = (32401 + 37999) = (32402 + 37999)$
0071	Mod : $(25205 + 28916) = (26111 + 28916) = (26485 + 28916) = (26999 + 28916) = (28382 + 28916) = (30241 + 28916) = (30631 + 28916) = (30635 + 28916) = (26999 + 28479) = (28382 + 28479) = (26999 + 28702) = (28382 + 28702)$
R 0072	Mod : $37999 = (32401 + 35651 + 37999) = (32401 + 37588 + 37999) = (32929 + 37588 + 37999)$
0077	Mod : $(27498 + 36847 + 56-5-A1/A3/B4) = (27498 + 36311 + 36847/B6)$
0078	Mod : $(20343 + 36847) = (27498 + 31276 + 36847)$
R 0080	Mod : $(26495 + 28916 + 34637 + 37999) = (26526 + 26999 + 28479 + 34637 + 37999) = (26526 + 26999 + 28382 + 28479 + 34637 + 37999)$
	Mod : $(21678 + 26999 + 27531 + 26925) = (21678 + 27531 + 27646 + 26925) = (21678 + 27531 + 30631 + 26925) = (21678 + 26485 + 27531 + 26925) = (21678 + 26999 + 27531 + 27620 + 33497 + 26925)$
R 0082	Mod : $(20343 + 22013 + 36847 + V2530/V2533) = (31276 + 22013 + 36847 + V2530/V2533) = (20343 + 27498 + 22013 + 36847 + V2530/V2533) = (31276 + 27498 + 22013 + 36847 + V2530/V2533) = (20343 + 22013 + 36847 + 56-5-B1/B2/B3) = (31276 + 22013 + 36847 + 56-5-B1/B2/B3) = (20343 + 27498 + 22013 + 36847 + 56-5-B1/B2/B3) = (31276 + 27498 + 22013 + 36847 + 56-5-B1/B2/B3)$
	Mod : $(21678 + 26999 + 27531 + 27620 + 33497 + 26925) = (21678 + 26999 + 27531 + 27620 + 37285)$
R 0083	Mod : $(21678 + 26999 + 27531 + 27620) = (21678 + 26999 + 27531 + 27620 + 37285)$

CODE	DESIGNATION
0084	"Mod : $(25205 + 35871) = (23885 + 35871) = (26999 + 35871) = (28382 + 35871) = (30241 + 35871) = (26485 + 35871) = (30631 + 35871) = (26999 + 28382 + 28495 + 35871) = (25205 + 26999 + 28495 + 35871)$ "
0087	Mod : $(32090 + 32499) = (28160 + 28917 + 32090 + 32499)$
0088	Mod : $(20268 + 21678 + 25404 + 26925 + 28160 + 36311 + 24946) = (20268 + 21678 + 25404 + 27773 + 28160 + 36311 + 24946) = (20268 + 21678 + 25404 + 31106 + 28160 + 36311 + 24946) = (20268 + 21678 + 24946 + 25404 + 26965 + 27773 + 28160 + 31106 + 36311)$
R 0089	Mod : $(26526 + 26999 + 28479 + 37999) = (26526 + 26999 + 28382 + 28495 + 28479 + 37999)$
	Mod : $(20268 + 26965 + 36311 + 24946) = (20268 + 27773 + 36311 + 24946) = (20268 + 31106 + 36311 + 24946) = (20268 + 24946 + 26965 + 27773 + 31106 + 36311)$
0091	Mod : $(22013 + 27498 + 36847 + 56-5-B1/B2/B3/V2530/V2533)$
0092	Mod : $(20268 + 26925 + 26965 + 36311 + 24946) = (20268 + 26925 + 27773 + 36311 + 24946) = (20268 + 26925 + 31106 + 36311 + 24946) = (20268 + 24946 + 26925 + 26965 + 27773 + 31106 + 36311)$
0093	Mod : $20268 = (20268 + 26999 + 28495)$
R 0094	Mod: $(20268 + 21678 + 24946 + 25404 + 27773 + 28160 + 37999) = (20268 + 21678 + 24946 + 25404 + 28160 + 31106 + 37999) = (20268 + 21678 + 25404 + 25951 + 28160 + 31106 + 37999) = (20268 + 21678 + 25404 + 28160 + 31106 + 32311 + 37999) = (20268 + 21678 + 25404 + 28160 + 31106 + 32311 + 37999) = (20268 + 21678 + 25404 + 28160 + 31106 + 32238 + 37999) = (20268 + 21678 + 25404 + 26965 + 27773 + 31106 + 32311 + 35040 + 37999) = (20268 + 21678 + 25404 + 26965 + 27773 + 31106 + 32311 + 35040 + 37999)$
	Mod: $31897 = 32929 = ((31897 + 35651) + V2527A5) = (31897 + 32333 + 32929)$
0099	Mod: $(20268 + 26925 + 26965) = (20268 + 27773 + 31106 + 35040) = (20268 + 27773 + 31106 + 32311 + 35040) = (20268 + 24946 + 27773 + 31106 + 35040) = (20268 + 24946 + 27773 + 31106 + 32150 + 35040) = (20268 + 24946 + 27773 + 31106 + 32311 + 35040) = (20268 + 26925 + 26965 + 27773 + 31106 + 32311 + 35040)$
0100	Mod : $(25205 + 20268) = (23885 + 20268) = (26999 + 20268) = (28382 + 20268) = (30241 + 20268) = (26485 + 20268) = (30631 + 20268) = (26999 + 28382 + 28495 + 20268) = (25205 + 26999 + 28495 + 20268)$
0101	Mod : $(20268 + 24946 + 26965) = (20268 + 24946 + 27773) = (20268 + 25951 + 26965) = (20268 + 25951 + 27773) = (20268 + 26760 + 26965) = (20268 + 26760 + 27773) = (20268 + 26965 + 32150) = (20268 + 26965 + 32238) = (20268 + 26965 + 32239) = (20268 + 26965 + 32311) = (20268 + 27773 + 32150) = (20268 + 27773 + 32238) = (20268 + 27773 + 32239) = (20268 + 27773 + 32311) = (20268 + 26965 + 35040) = (20268 + 27773 + 35040) = (20268 + 27773 + 31106 + 35040 + MXA) = (20268 + 24946 + 27773 + 31106 + 35040 + MXA) = (20268 + 24946 + 27773 + 31106 + 35040 + MXA) = (20268 + 24946 + 27773 + 31106 + 32311 + 35040 + MXA)$
0102	Mod : $(24105 + 25529 + 30206) = (24105 + 25529 + 36136) = (24105 + 25819 + 36136) = (24105 + 26117 + 36136)$
0103	Mod : $(20268 + 26925 + 31106) = (20268 + 26925 + 26965) = (20268 + 26925 + 26965 + 27773 + 31106 + 32311 + 35040)$
0104	Mod : $(20268 + 26965) = (20268 + 31106) = (20268 + 26925 + 27773 + 31106 + 32311 + 35040)$

CODE	DESIGNATION
0106	$\begin{aligned} \text{Mod: } (20268 + 24946 + 26925 + 26965) &= (20268 + 24946 + 26925 + 27773) = \\ (20268 + 25951 + 26925 + 26965) &= (20268 + 25951 + 26925 + 27773) = \\ (20268 + 26760 + 26925 + 26965) &= (20268 + 26760 + 26925 + 27773) = \\ (20268 + 26925 + 26965 + 32150) &= (20268 + 26925 + 26965 + 32238) = \\ (20268 + 26925 + 26965 + 32239) &= (20268 + 26925 + 26965 + 32311) = \\ (20268 + 26925 + 27773 + 32150) &= (20268 + 26925 + 27773 + 32238) = \\ (20268 + 26925 + 27773 + 32239) &= (20268 + 26925 + 27773 + 32311) = \\ (20268 + 26925 + 27773 + 31106 + 32311 + 35040) \end{aligned}$
0107	$\begin{aligned} \text{Mod: } (20268 + 26965) &= (20268 + 31106) = \\ (20268 + 26965 + 27773 + 31106 + 32311 + 35040) \end{aligned}$
0108	$\begin{aligned} \text{Mod: } (20268 + 26925 + 26965) &= \\ (20268 + 26925 + 26965 + 27773 + 31106 + 32311 + 35040) \end{aligned}$
0109	$\begin{aligned} \text{Mod: } (20268 + 26925 + 26965) &= \\ (20268 + 26925 + 26965 + 27773 + 31106 + 32311 + 35040) \end{aligned}$
0110	$\begin{aligned} \text{Mod : } (20268 + 26925 + 26965 + 28342) &= \\ (20268 + 24946 + 26925 + 28342 + 31106) &= \\ (20268 + 26925 + 26965 + 27773 + 28342 + 31106 + 32311 + 35040) \end{aligned}$
0111	$\begin{aligned} \text{Mod: } (20268 + 31106 + 25647) &= (20268 + 31106 + \text{ACA}) = \\ (20268 + 31106 + \text{MXA}) &= (20268 + 25647 + 26965) = (20268 + 26965 + \text{ACA}) = \\ (20268 + 26965 + \text{MXA}) &= \\ (20268 + 24946 + 25647 + 27773 + 31106 + 32150 + 35040 + \text{MXA}) &= (\\ 20268 + 24946 + 25647 + 27773 + 31106 + 35040 + \text{MXA}) = \\ (20268 + 24946 + 27773 + 31106 + \text{MXA}) &= \\ (20268 + 24946 + 27773 + 31106 + 35040 + \text{MXA}) &= \\ (20268 + 27773 + 31106 + 32311 + 35040 + \text{MXA}) \end{aligned}$
0112	$\begin{aligned} \text{Mod: } (20268 + 26925 + 26965) &= \\ (20268 + 26925 + 26965 + 27773 + 31106 + 32311 + 35040) \end{aligned}$
0113	$\begin{aligned} \text{Mod : } (25529 + 30206) &= (26117 + 30206) = (26117 + 36136) = \\ (25529 + 36136) \end{aligned}$
0114	$\begin{aligned} \text{Mod: } (20268 + 21678 + 25404 + 26965) &= (20268 + 21678 + 25404 + 31106) = \\ (20268 + 21678 + 25404 + 26965 + 27773 + 31106 + 32311 + 35040) \end{aligned}$
0115	$\begin{aligned} \text{Mod : } (20268 + 21678 + 24946 + 31106 + \text{MXA}) &= \\ (20268 + 21678 + 31106 + 32311 + \text{MXA}) &= \\ (20268 + 21678 + 27773 + 31106 + 35040 + \text{MXA}) &= \\ (20268 + 21678 + 24946 + 27773 + 31106 + 35040 + \text{MXA}) &= \\ (20268 + 21678 + 24946 + 27773 + 31106 + 32150 + 35040 + \text{MXA}) &= \\ (20268 + 21678 + 24946 + 27773 + 31106 + 32311 + 35040 + \text{MXA}) \end{aligned}$
R	$\begin{aligned} \text{Mod : } (24105 + 26270) &= (24105 + 25529) = (24105 + 25819) = \\ (24105 + 26117) \end{aligned}$
	$\begin{aligned} \text{Mod : } 20268 + 21678 + 25404 + 28160 + 27773 + 24946 &= \\ (20268 + 21678 + 24946 + 25404 + 28160 + 31106) &= \\ (20268 + 21678 + 25404 + 25951 + 28160 + 31106) &= \\ (20268 + 21678 + 25404 + 28160 + 31106 + 32311) &= \\ (20268 + 21678 + 25404 + 28160 + 31106 + 32238) &= \\ (20268 + 21678 + 25404 + 26965 + 27773 + 31106 + 32311 + 35040) \end{aligned}$
0119	$\begin{aligned} \text{Mod : } (20268 + 21678 + 25404) &= \\ (20268 + 21678 + 25404 + 26965 + 27773 + 28160 + 31106 + 32311 + 35040) \end{aligned}$
0120	$\begin{aligned} \text{Mod : } (22013 + 24215 + 24588 + 24794 + 26925 + 30422 + 31283 + 32090) &= \\ (24105 + 24215 + 24588 + 24794 + 26925 + 31283 + 32090 + 33973) &= \\ (24215 + 24588 + 24794 + 26925 + 28160 + 28378 + 31283 + 32090) \end{aligned}$
R	$\begin{aligned} \text{Mod : } (20268 + 24946 + 26965) &= (20268 + 24946 + 27773) = \\ (20268 + 25951 + 26965) &= (20268 + 25951 + 27773) = \\ (20268 + 26760 + 26965) &= (20268 + 26760 + 27773) = \\ (20268 + 26965 + 32150) &= (20268 + 26965 + 32238) = \\ (20268 + 26965 + 32239) &= (20268 + 26965 + 32311) = \\ (20268 + 27773 + 32150) &= (20268 + 27773 + 32238) = \\ (20268 + 27773 + 32239) &= (20268 + 27773 + 32311) = \\ (20268 + 26965 + 35040) &= (20268 + 27773 + 35040) = \\ (20268 + 26965 + 27773 + 31106 + 32311 + 35040) \end{aligned}$
	$\begin{aligned} \text{Mod: } (24215 + 24588 + 24794 + 31283 + 32090) &= \\ (24215 + 24588 + 24794 + 28160 + 28917 + 31283 + 32090) &= \\ (24215 + 24588 + 24794 + 31283 + 32090 + 34862 + 37809) &= \\ (24215 + 24588 + 24794 + 28160 + 28917 + 31283 + 32090 + 34862 + 37809) \end{aligned}$

CODE	DESIGNATION
0125	Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+25951+26965) = (20268+25951+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311) =$ $(20268+26965+35040) = (20268+27773+35040) =$ $(20268+26965+27773+31106+32311+35040)$
0126	Mod: $(20268+26965) = (20268+31106) =$ $(20268+26965+27773+31106+32311+35040)$
0127	Mod: $(20268+28342+31106) = (20268+28342+26965) =$ $(20268+26965+27773+28342+31106+32311+35040)$
0128	Mod: $(20268+31106+25647) = (20268+31106+ACA) =$ $(20268+31106+MXA) = (20268+25647+26965) = (20268+26965+ACA) =$ $(20268+26965+MXA) = (20268+24946+27773+31106+35040+MXA) =$ $(20268+27773+31106+32311+35040+MXA) =$ $(20268+24946+25647+27773+31106+35040+MXA) =$ $(20268+24946+25647+27773+31106+32150+35040+MXA)$
R	0131 Mod : $(20268+28342) = (20268+28342+31106) = (20268+28342+26965)$
	0132 Mod : $20268 = (20268+25800) = (20268+24404+35404) =$ $(20268+27727+35404) = (20268+24404+27727+35404) =$ $(20268+24404+25800+35404) = (20268+25800+27727+35404) =$ $(20268+24404+25800+27727+35404)$
	0133 Mod : $(20268+26965) = (20268+31106) =$ $(20268+26965+27773+31106+32311+35040)$
	0134 Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+25951+26965) = (20268+25951+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311) =$ $(20268+26965+35040) = (20268+27773+35040) =$ $(20268+26965+27773+31106+32311+35040)$
	0135 Mod : $(20268+25647) =$ $(MXA+20268+26965+27773+31106+32311+35040)$
	0136 Mod : $20268 = (20268+26965+27773+31106+32311+35040)$
	0137 Mod: $(20268+31106+25647) = (20268+31106+ACA) =$ $(20268+31106+MXA) = (20268+25647+26965) = (20268+26965+ACA) =$ $(20268+26965+MXA) = (20268+27773+31106+32311+35040+MXA) =$ $(20268+26965+27773+31106+32311+35040+MXA) =$ $(20268+24946+27773+31106+32311+35040+MXA) =$ $(20268+24946+25647+27773+31106+32311+35040+MXA)$
	0138 Mod: $(20268+28342+31106) = (20268+28342+26965) =$ $(20268+26965+27773+28342+31106+32311+35040)$
	0139 Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+25951+26965) = (20268+25951+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311) =$ $(20268+26965+35040) = (20268+27773+35040) =$ $(20268+26965+27773+31106+32311+35040)$
R	0141 Mod : $STD = 34862 = 34861 = 34864 = (31283+34862) =$ $(31283+34861) = (31283+34864)$
R	0142 Mod : $24215 = 24588 = 25534 = (24215+24588)$
	0143 Mod : $(20268+V2533) = (20268+31607+V2530)$
	0144 Mod : $(20268+21678+25404) = (20268+21678+25404+28160+28917)$
	0145 MSN : $460 = 461 = 558 = 561 = 733 = 741 = 747 = 789 = 874 = 902 =$ $912 = 916$
	0146 Mod : $STD = (31283+34864) = (31283+34861) = (31283+34862)$

CODE	DESIGNATION
0147	Mod : $(25205 + 26526) = (26111 + 26526) = (26485 + 26526) = (26526 + 26999) = (26526 + 28382) = (26526 + 30241) = (26526 + 30631) = (26526 + 30635)$
0148	Mod : $(20268 + 21678 + 24044 + 25404 + 25647) = (20268 + 21678 + 24044 + 25404 + \text{ACA})$
0149	Mod : $(25205 + 26526 + 28916) = (26111 + 26526 + 28916) = (26526 + 26999 + 28479) = (26526 + 26999 + 28702) = (26526 + 28382 + 28916) = (26526 + 28916 + 30631) = (26526 + 28916 + 30635) = (26526 + 26999 + 28916) = (26526 + 26999 + 28382 + 28702)$
0150	Mod : $(20268 + 21678 + 25404 + 25647) = (20268 + 21678 + 25404 + \text{MXA})$
0151	Mod : $(26485 + 28916 + 34637) = (26526 + 26999 + 28479 + 34637) = (26526 + 26999 + 28382 + 28479 + 34637)$
R 0152	Mod : $(20268 + 21678 + 25404 + 26925 + 28160 + 36311 + 24946/\text{B6}) = (20268 + 21678 + 25404 + 27773 + 28160 + 36311 + 24946/\text{B6}) = (20268 + 21678 + 25404 + 31106 + 28160 + 36311 + 24946/\text{B6}) = (20268 + 21678 + 25404 + 26965 + 28160 + 36297 + 24946/\text{B5}) = (20268 + 21678 + 25404 + 27773 + 28160 + 36297 + 24946/\text{B5}) = (20268 + 21678 + 25404 + 31106 + 28160 + 36297 + 24946/\text{B5})$
0153	Mod : $(28258 + 20343 + 26526) = (28258 + 31276 + 26526) = (30470 + 20343 + 26526) = (30470 + 31276 + 26526) = (26438 + 20343 + 26526) = (27624 + 20343 + 26526) = (23888 + 20343 + 26526) = (23888 + 31276 + 26526) = (26438 + 31276 + 26526) = (27624 + 31276 + 26526) = (28258 + 20343 + 27498 + 26526) = (30470 + 20343 + 27498 + 26526) = (26438 + 20343 + 27498 + 26526) = (27624 + 20343 + 27498 + 26526) = (23888 + 20343 + 27498 + 26526) = (28258 + 31276 + 27498 + 26526) = (30470 + 31276 + 27498 + 26526) = (26438 + 31276 + 27498 + 26526) = (27624 + 31276 + 27498 + 26526) = (26526 + 27498 + 31276 + 34330) = (26526 + 27498 + 31276 + 34331) = (26526 + 27498 + 31276 + 34332) = (26526 + 27498 + 31276 + 34333) = (26526 + 27498 + 31276 + 34334) = (26526 + 27498 + 31276 + 35436) = (26526 + 27498 + 31276 + 34331 + 34637) = (26526 + 27498 + 31276 + 34333 + 34637) = (26526 + 27498 + 31276 + 34332 + 34637) = (26526 + 27498 + 31276 + 34637 + 35436)$
R 0157	Mod : $(24215 + 32090) = (24588 + 32090) = (25534 + 32090) = (24215 + 24588 + 32090)$
R 0158	Mod : $(30020 + 35220 + 35542) = (24105 + 30020 + 35220 + 35542)$
0160	Mod: $(24215 + 24588 + 24794 + 26925 + 35871 + 32090) = (24215 + 24588 + 24794 + 26925 + 35220 + 32090)$
0161	Mod : $24215 = 24588 = 25534 = (24215 + 24588) = (24215 + 25534) = (24215 + 24588 + 25534) = (24215 + 24588 + 28917) = (24215 + 28160 + 28917) = (24588 + 28160 + 28917) = (25534 + 28160 + 28917) = (24215 + 24588 + 28160 + 28917)$
0162	Mod : $(22013 + 24215) = (22013 + 24588) = (22013 + 25534) = (24105 + 24215) = (24105 + 24588) = (24105 + 25534) = (24215 + 28160) = (24588 + 28160) = (25534 + 28160) = (22013 + 24215 + 24588) = (24105 + 24215 + 24588) = (24215 + 24588 + 28160)$
R 0164	Mod : $(22013 + 25529) = (22013 + 25819) = (22013 + 26117) = (22013 + 26270)$
0166	Mod: $(21678 + 27522 + 35227) = (21678 + 27522 + 35865)$
0167	Mod : $(20268 + 24946 + 26965 + 34041) = (20268 + 24946 + 31106 + 34041) = (20268 + 24946 + 27773 + 34041) = (20268 + 27773 + 31106 + 32238 + 34041) = (20268 + 24946 + 26965 + 27773 + 31106 + 34041)$
0168	Mod : $(22013 + 25419 + 26925) = (24105 + 25419 + 26925) = (24701 + 25419 + 26925)$

CODE	DESIGNATION
0169	Mod : $(20268+21678+24946+25404+27773+28160) =$ $(20268+21678+25404+28160+31106+32311) =$ $(20268+21678+25404+277773+28160+35040) =$ $(20268+21678+24946+25404+26965+27773+28160) =$ $(20268+21678+25404+26965+27773+31106+32311+35040) =$ $(20268+21678+25404+27773+28160+31106+32311) =$ $(20268+21678+24946+25404+27773+28160+31106)$
0170	Mod : $(20268+26925+26965+27773+31106+32311+35040) =$ $(20268+24946+26965+26925+27773+31106)$
0171	Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+25951+26965) = (20268+25951+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311) =$ $(20268+26965+35040) = (20268+27773+35040)$
0172	Mod : $(20268+25647) = (20268+ACA) = (20268+MXA)$
0173	Mod : $(20268+25647) = (20268+ACA)$
0174	Mod : $(20268+24044+25647) = (20268+24044+ACA)$
0175	Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+25951+26965) = (20268+25951+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311) =$ $(20268+26965+35040) = (20268+27773+35040) =$ $(20268+26965+27773+31106+32311+35040)$
0176	Mod: $(20268+24946+26925+26965) = (20268+24946+26925+27773) =$ $(20268+25951+26925+26965) = (20268+25951+26925+27773) =$ $(20268+26760+26925+26965) = (20268+26760+26925+27773) =$ $(20268+26925+26965+32150) = (20268+26925+26965+32238) =$ $(20268+26925+26965+32239) = (20268+26925+26965+32311) =$ $(20268+26925+27773+32150) = (20268+26925+27773+32238) =$ $(20268+26925+27773+32239) = (20268+26925+27773+32311) =$ $(20268+26965+26925+27773+31106+32311+35040)$
0177	Mod : $(20268+24946+31106+34041) =$ $(20268+27773+31106+32238+34041)$
0178	Mod : $(20268+24044+26925) = (20268+24044+26925+27773+31106)$
0179	Mod : $(22013+32456) = (22013+27846+28479+28721) =$ $(22013+27846+28479+28960) = (22013+27846+28721+28916) =$ $(22013+27846+28916+28960) = (22013+27846+28479+32011) =$ $(22013+27846+28916+32011) = (22013+28479+28960+30439) =$ $(22013+28479+28721+30439) = (22013+28479+30439+32011)$
0181	Mod : $(MXA+20268+27773+31106+35040) =$ $(MXA+20268+27773+31106+32311+35040) =$ $(MXA+20268+24946+27773+31106+32150+35040) =$ $(MXA+20268+24946+27773+31106+32311+35040)$
0182	Mod : $(20268+31106+25647) = (20268+31106+ACA) =$ $(20268+31106+MXA) = (20268+26965+25647) =$ $(20268+26965+ACA) = (20268+26965+MXA)$
R 0183	Mod : $(36136+25529) = (36136+26117) = (36136+26270) =$ $(36136+25819)$

CODE	DESIGNATION
0184	Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+25951+26965) = (20268+25951+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311) =$ $(20268+26965+35040) = (20268+27773+35040) =$ $(20268+27773+31106+35040) =$ $(20268+26965+27773+31106+35040)$
0185	Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+25951+26965) = (20268+25951+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311) =$ $(20268+26965+35040) = (20268+27773+35040) =$ $(20268+26965+27773+31106+35040)$
R 0186	Mod : $(22013+24215) = (22013+24588) = (22013+25534) =$ $(22013+24215+24588) = (24215+24588+28160)$
R 0187	Mod : $(20268+26965) = (20268+31106)$
R 0188	Mod : $(24105+24215+24588+24794+28238+32635)$
0189	Mod : $(STD = (28160+28917))/(56-5-A1/A3/V2500/V2527/V2527EA5)$
0190	Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+25951+26965) = (20268+25951+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311) =$ $(20268+26965+35040) = (20268+27773+35040) =$ $(20268+27773+31106+35040) =$ $(20268+26965+27773+31106+35040)$

CODE	DESIGNATION
0191	<p>Mod : $(20268+25647+26965) = (20268+25647+27773) =$ $(20268+24946+25647+26965) = (20268+24946+25647+27773) =$ $(20268+25647+25951+26965) = (20268+25647+25951+27773) =$ $(20268+25647+26760+26965) = (20268+25647+26760+27773) =$ $(20268+25647+26965+32150) = (20268+25647+26965+32238) =$ $(20268+25647+26965+32239) = (20268+25647+26965+32311) =$ $(20268+25647+27773+32150) = (20268+25647+27773+32238) =$ $(20268+25647+27773+32239) = (20268+25647+27773+32311) =$ $(20268+25647+26965+35040) = (20268+25647+27773+35040) =$ $(24946+26965+ACA) = (24946+27773+ACA) =$ $(25951+26965+ACA) = (25951+27773+ACA) =$ $(26760+26965+ACA) = (26760+27773+ACA) =$ $(26965+32150+ACA) = (26965+32238+ACA) =$ $(26965+32239+ACA) = (26965+32311+ACA) =$ $(27773+32150+ACA) = (27773+32238+ACA) =$ $(27773+32239+ACA) = (27773+32311+ACA) =$ $(26965+35040+ACA) = (27773+35040+ACA) =$ $(20268+25647+26965+ACA) = (20268+25647+27773+ACA) =$ $(20268+24946+25647+26965+ACA) =$ $(20268+24946+25647+27773+ACA) =$ $(20268+25647+25951+26965+ACA) =$ $(20268+25647+25951+27773+ACA) =$ $(20268+25647+26760+26965+ACA) =$ $(20268+25647+26760+27773+ACA) =$ $(20268+25647+26965+32150+ACA) =$ $(20268+25647+26965+32238+ACA) =$ $(20268+25647+26965+32239+ACA) =$ $(20268+25647+27773+32150+ACA) =$ $(20268+25647+27773+32238+ACA) =$ $(20268+25647+27773+32239+ACA) =$ $(20268+25647+27773+32311+ACA) =$ $(20268+25647+26965+35040+ACA) =$ $(20268+25647+27773+35040+ACA)$ </p>
0192	<p>Mod : $(20268+24946+25647+26965) = (20268+24946+25647+27773) =$ $(20268+25647+25951+26965) = (20268+25647+25951+27773) =$ $(20268+25647+26760+26965) = (20268+25647+26760+27773) =$ $(20268+25647+26965+32150) = (20268+25647+26965+32238) =$ $(20268+25647+26965+32239) = (20268+25647+26965+32311) =$ $(20268+25647+27773+32150) = (20268+25647+27773+32238) =$ $(20268+25647+27773+32239) = (20268+25647+27773+32311) =$ $(20268+25647+26965+35040) = (20268+25647+27773+35040) =$ $(24946+26965+ACA) = (24946+27773+ACA) =$ $(25951+26965+ACA) = (25951+27773+ACA) =$ $(26760+26965+ACA) = (26760+27773+ACA) =$ $(26965+32150+ACA) = (26965+32238+ACA) =$ $(26965+32239+ACA) = (26965+32311+ACA) =$ $(27773+32150+ACA) = (27773+32238+ACA) =$ $(27773+32239+ACA) = (27773+32311+ACA) =$ $(26965+35040+ACA) = (27773+35040+ACA) =$ $(20268+24946+25647+26965+ACA) =$ $(20268+24946+25647+27773+ACA) =$ $(20268+25647+25951+26965+ACA) =$ $(20268+25647+25951+27773+ACA) =$ $(20268+25647+26760+26965+ACA) =$ $(20268+25647+26760+27773+ACA) =$ $(20268+25647+26965+32150+ACA) =$ $(20268+25647+26965+32238+ACA) =$ $(20268+25647+26965+32239+ACA) =$ $(20268+25647+26965+32311+ACA) =$ $(20268+25647+27773+32150+ACA) =$ $(20268+25647+27773+32238+ACA) =$ $(20268+25647+27773+32239+ACA) =$ $(20268+25647+27773+32311+ACA) =$ $(20268+25647+26965+35040+ACA) =$ $(20268+25647+27773+35040+ACA)$ </p>

CODE	DESIGNATION
0193	Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+25951+26965) = (20268+25951+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311) =$ $(20268+26965+35040) = (20268+27773+35040) =$ $(20268+27773+31106+35040) =$ $(20268+26965+27773+31106+35040)$
0194	$56-5-A4 = 56-5-A5 = 56-5-B5 = 56-5-B6 = 56-5-B7 = V2522A5 = V2524A5$ $= 2527MA5$
0195	Mod : $(20343+56-5-A4/A5/B5/B6/B7) = (20343+V2522/V2524/2527MA5) =$ $(31276+27498+56-5-A4/A5/B5/B6/B7) =$ $(31276+27498+V2522/V2524/2527MA5)$
0196	Mod : $(21678+26999+27531) = (21678+27531+27646) =$ $(21678+27531+30631) = (21678+27531+30635) =$ $(21678+26485+27531) = (21678+26999+27531+27620+33497)$
0197	Mod : $(21678+26485) = (21678+26999) = (21678+27646) =$ $(21678+30631) = (21678+30635) = (21678+26999+33497) =$ $(21678+26999+27620+33497) = (21678+26999+27646+33497)$
0198	Mod : $(V2522/V2524/2527MA5+20343) = (56-5-A4/A5/B5/B6/B7+20343) =$ $(V2522/V2524/2527MA5+31276) = (56-5-A4/A5/B5/B6/B7+31276) =$ $(V2522/V2524/2527MA5+20343+27498) =$ $(56-5-A4/A5/B5/B6/B7+20343+27498) =$ $(V2522/V2524/2527MA5+31276+27498) =$ $(56-5-A4/A5/B5/B6/B7+31276+27498)$
0200	Mod : $(20268+25647+26965) = (20268+25647+31106)$
0201	Mod : $27498+(56-5-A4 = 56-5-A5 = 56-5-B5 = 56-5-B6 = 56-5-B7 =$ $V2522A5 = V2524A5 = 2527MA5)$
0202	Mod : $20268 = (20268+25800)/(T=L)$
0203	Mod : $20268 = (20268+25800)+56-5-B8+L)$
0204	Mod : $(20268+28342+31106) = (20268+28342+26965)$
0205	Mod : $(20268+31106) = (20268+26965)$
0206	Mod : $(20343+V2500/V2527/V2527E) =$ $(27498+31276+V2500/V2527/V2527E)$
0208	Mod : $(20268+24946+26965) = (20268+24946+27773) =$ $(20268+26760+26965) = (20268+26760+27773) =$ $(20268+26965+32150) = (20268+26965+32238) =$ $(20268+26965+32239) = (20268+26965+32311) =$ $(20268+27773+32150) = (20268+27773+32238) =$ $(20268+27773+32239) = (20268+27773+32311)$
0209	Mod : $(21678+21706+21768) = (21678+21706+21768+21858+26347)$
0210	Mod : $((20343 = 31276)/V2500/V2527/V2527E) = ((20343+27498) =$ $(27498+31276))/V2500/V2527/V2527E)$
R 0211	Mod : $(24215+24794+32090) = (24215+24588+24794+32090) =$ $(24215+24588+24794+28160+28917+32090) =$ $(24215+24588+24794+28160+28917+32090+31283+34864)$
R 0212	Mod : $(22013+24215+24794+32090) =$ $(22013+24215+24588+24794+32090) =$ $(24105+24215+24588+24794+32090) =$ $(24215+24588+24794+28160+32090) =$ $(24215+24588+24794+28160+32090+31283+34861) =$ $(24215+24588+24794+28160+32090+31283+34862) =$ $(22013+24215+24588+24794+32090+31283+34864) =$ $(24105+24215+24588+24794+32090+31283+34862)$
R 0214	Mod : $(20268+21678+25404+26965+28160+36297+24946) =$ $(20268+21678+25404+27773+28160+36297+24946)$
0215	Mod : $20343 = 31276 = (20343+27498) = (31276+27498)$
R 0216	Mod : $(20268+26965+24946+36297) = (20268+27773+24946+36297)$

CODE	DESIGNATION
R 0217	Mod : $(20268+26925+26965+24946+36297) = (20268+26925+27773+24946+36297)$
R 0218	Mod : $56-5-B4 = (56-5-B5+36297) = (56-5-B6+36311) = (56-5-B4+28160+28917) = (56-5-B5+28160+28917+36297) = (56-5-B6+36311+28160+28917)$
R 0219	Mod : $(20343+22013/V2530/V2533) = (31276+22013/V2530/V2533) = (20343+27498+22013/V2530/V2533) = (31276+27498+22013/V2530/V2533) = (20343+22013/B1/B2/B3) = (31276+22013/B1/B2/B3) = (20343+27498+22013/B1/B2/B3) = (31276+27498+22013/B1/B2/B3)$
0220	Mod : $(22013+27498)$
0221	MSN : 0633 0756 0784 0812 0877 0930 0993 1024 1253 1695 1721 1984 2021 2229 2238 2428
R 0222	Mod : $(20268+21678+24946+27773)$
R 0223	Mod : $(56-5-A1/A3/B4+20268) = (56-5-B5+20268+36297) = (56-5-B6+20268+36311)$
R 0224	Mod : $(56-5-A1/A3/B4) = (56-5-B6+36311) = (56-5-B5+26297)$
R 0225	Mod : $(22013+24215+24588+28652+32090)$
0226	Mod : $(20343+56-5-A1/A3/B4) = (27498+31276+56-5-A1/A3/B4) = (20343+36311+56-5-B6) = (27498+31276+36311+56-5-B6)$
0227	Mod : $(20343+56-5-A1/A3/B4) = (31276+56-5-A1/A3/B4) = (27498+31276+56-5-A1/A3/B4) = (20343+27498+56-5-A1/A3/B4) = (20343+36311+56-5-B6) = (31276+36311+56-5-B6) = (27498+31276+36311+56-5-B6) = (20343+27498+36311+56-5-B6)$
0228	Mod : $(27498+56-5-A1/A3/B4) = (27498+36311+56-5-B6)$
0229	Mod : $24105 = (24105+26999+28495)$
0230	Mod : $(23885+24105) = (25205+24105) = (26485+24105) = (26999+24105) = (28382+24105) = (30241+24105) = (30631+24105) = (25205+26999+28495+24105) = (26999+28382+28495+24105)$
R 0231	Mod : $34041 = (34041+26999+28945)$
R 0232	Mod : $(CFM 56-5-B4+25205+20268) = (CFM 56-5-B4+23885+20268) = (CFM 56-5-B4+26999+20268) = (CFM 56-5-B4+28382+20268) = (CFM 56-5-B4+30241+20268) = (CFM 56-5-B4+26485+20268) = (CFM 56-5-B4+30631+20268) = (CFM 56-5-B4+26999+28382+28495+20268) = (CFM 56-5-B4+25205+26999+28495+20268) = (CFM 56-5-B6+25205+20268+36311) = (CFM 56-5-B6+23885+20268+36311) = (CFM 56-5-B6+26999+20268+36311) = (CFM 56-5-B6+28382+20268+36311) = (CFM 56-5-B6+30241+20268+36311) = (CFM 56-5-B6+26485+20268+36311) = (CFM 56-5-B6+30631+20268+36311) = (CFM 56-5-B6+26999+28382+28495+20268+36311) = (CFM 56-5-B6+25205+26999+28495+20268+36311) = (56-5-B5+25205+20268+36297) = (56-5-B5+23885+20268+36297) = (56-5-B5+26999+20268+36297) = (56-5-B5+28382+20268+36297) = (56-5-B5+30241+20268+36297) = (56-5-B5+26485+20268+36297) = (56-5-B5+30631+20268+36297)$

CODE	DESIGNATION
0233	Mod : $20139 = (20139 + 26999 + 28495)$
0234	Mod : $(23885 + 20139) = (25205 + 20139) = (26485 + 20139) = (26999 + 20139) = (28382 + 20139) = (30241 + 20139) = (30631 + 20139) = (25205 + 26999 + 28495 + 20139) = (26999 + 28382 + 28495 + 20139)$
R 0235	Mod : $(56-5-B4/B5/B6 + 20268) = (56-5-B4/B5/B6 + 20268 + 26999 + 28495) = (56-5-B6 + 20268 + 36311) = (56-5-B5 + 20268 + 36297) = (56-5-B6 + 20268 + 26999 + 28495 + 36311) = (56-5-B5 + 20268 + 26999 + 28495 + 36297)$
R 0236	Mod : $(24215 + 24588 + 24794 + 28378 + 32090) = (24215 + 24588 + 24794 + 32090 + 34456)$
0237	Mod: $(20268 + 24946 + 26965 + 25647) = (20268 + 24946 + 27773 + 25647) = (20268 + 25951 + 26965 + 25647) = (20268 + 25951 + 27773 + 25647) = (20268 + 26760 + 26965 + 25647) = (20268 + 26760 + 27773 + 25647) = (20268 + 26965 + 32150 + 25647) = (20268 + 26965 + 32238 + 25647) = (20268 + 26965 + 32239 + 25647) = (20268 + 26965 + 32311 + 25647) = (20268 + 27773 + 32150 + 25647) = (20268 + 27773 + 32238 + 25647) = (20268 + 27773 + 32239 + 25647) = (20268 + 27773 + 32311 + 25647) = (20268 + 26965 + 25647 + 35040) = (20268 + 27773 + 25647 + 35040)$
0238	Mod: $(20268 + 28342 + 31106) = (20268 + 28342 + 26965)$
0239	Mod : $(20268 + 21678 + 25404 + 26965 + 28342) = (20268 + 21678 + 25404 + 28342 + 31106)$
0240	Mod : $(20268 + 21678 + 25404 + 26965) = (20268 + 21678 + 25404 + 31106)$
0241	Mod : STD = 30020 = $(26999 + 28495) = (24105 + 30020) = (26999 + 28495 + 30020) = (26999 + 28495 + 24105 + 30020)$
0242	Mod : $(20268 + 26965) = (20268 + 31106)$
0243	Mod : $(20268 + 25647 + 26965) = (20268 + 25647 + 31106)$
R 0244	Mod : $(56-5-B4 + 20268) = (56-5-B6 + 20268 + 36311) = (56-5-B5 + 20268 + 36297)$
R 0245	Mod : $36297 = (20268 + 26965 + 24946 + 36297) = (20268 + 27773 + 24946 + 36297)$
0246	Mod : $25205 = 23885 = 26999 = 28382 = 30241 = 26485 = 30631 = (23885 + 30020) = (25205 + 30020) = 26485 + 30020) = (26999 + 30020) = (28382 + 30020) = (30241 + 30020) = (30631 + 30020) = (26999 + 28382 + 28495) = (25205 + 26999 + 28495) = (23885 + 24105 + 30020) = (25205 + 24105 + 30020) = (26485 + 24105 + 30020) = (26999 + 24105 + 30020) = (28382 + 24105 + 30020) = (30241 + 24105 + 30020) = (30631 + 24105 + 30020) = (25205 + 26999 + 28495 + 30020) = (26999 + 28382 + 28495 + 30020) = (25205 + 26999 + 28495 + 24105 + 30020) = (26999 + 28382 + 28495 + 24105 + 30020)$
0247	Mod : $(20268 + 21678 + 25404 + 25647 + 26965) = (20268 + 21678 + 25404 + 25647 + 31106)$
0248	Mod: $20268 = (20268 + 25800) = (20268 + 25530 + 26505) = (20268 + 25800 + 25530 + 26505)$
R 0249	Mod : $(24105 + 24215 + 24588 + 24794 + 28238 + 32090)$
0250	Mod: $(20268 + 24946 + 26925 + 26965) = (20268 + 24946 + 26925 + 27773) = (20268 + 25951 + 26925 + 26965) = (20268 + 25951 + 26925 + 27773) = (20268 + 26760 + 26925 + 26965) = (20268 + 26760 + 26925 + 27773) = (20268 + 26925 + 26965 + 32150) = (20268 + 26925 + 26965 + 32238) = (20268 + 26925 + 26965 + 32239) = (20268 + 26925 + 26965 + 32311) = (20268 + 26925 + 27773 + 32150) = (20268 + 26925 + 27773 + 32238) = (20268 + 26925 + 27773 + 32239) = (20268 + 26925 + 27773 + 32311)$

CODE	DESIGNATION
0251	$Mod: 31896 = 32475 = (31896+32332+32475) = (31896+25530+26505) = (32475+25530+26505) = (31896+32332+32475+25530+26505)$
0252	$Mod: (31896+25530) = (32475+25530) = (31896+32332+32475+25530) = (31896+25530+27727) = (32475+25530+27727) = (31896+32332+32475+25530+27727) = (31896+27727) = (31896+32332+32475+27727)$
0253	$Mod: (20268+21678+24946+26965) = (20268+21678+24946+27773) = (20268+21678+25951+26965) = (20268+21678+25951+27773) = (20268+21678+26760+26965) = (20268+21678+26760+27773) = (20268+21678+26965+32150) = (20268+21678+26965+32238) = (20268+21678+26965+32239) = (20268+21678+26965+32311) = (20268+21678+27773+32150) = (20268+21678+27773+32238) = (20268+21678+27773+32239) = (20268+21678+27773+32311)$
R 0254	$Mod : (56-5-B6+20268+36311) = (56-5-B5+20268+36297)$
0255	$Mod: 31896 = 32475 = (31896+32332+32475)$
0256	$Mod: 25800 = (25800+31896+32332)$
0257	$Mod: (20268+24946+26965) = (20268+24946+27773) = (20268+25951+26965) = (20268+25951+27773) = (20268+26760+26965) = (20268+26760+27773) = (20268+26965+32150) = (20268+26965+32238) = (20268+26965+32239) = (20268+26965+32311) = (20268+27773+32150) = (20268+27773+32238) = (20268+27773+32239) = (20268+27773+32311)$
0258	$Mod: (31896+32332) = (25800+31896) = (25800+32475) = (25800+31896+32332+32475)$
0259	$Mod: (31896=32475) = (31896+32332+32475)$
R 0260	$Mod : (20268+21678+25404+27773+31106+32311)$
R 0261	$Mod : (22013+24215+24588+24794+30422+32090) = (24215+24588+24794+28160+32090+34456) = (24215+24588+24794+28160+28378+32090) = (24105+24215+24588+24794+32090+37226)$
R 0262	$Mod : (24105+24215+24588+24794+28238+32090+32635)$
0263	$Mod : (B5/B6/B7/B8/B9) = (28160/B4) = (28160+36311/B6)$
0264	$Mod: (20268+21678+25404+27773+28160+31106+32238) = (20268+21678+24946+25404+27773+28160) = (20268+21678+25404+28160+31106+32311) = (20268+21678+25404+28160+31106+32239) = (20268+21678+24946+25404+26965+27773+28160) = (20268+21678+25404+26965+27773+28160+32311) = (20268+21678+25404+26965+27773+28160+31106+32311+35040)$
R 0265	$Mod : (31283+32090) = (32090+31283+34862+37809)$
0266	$Mod : (56-5-A4/A5) = (56-5-A4/A5+31896+32332)$
0267	$STD = Mod : (31897+32333)$
R 0268	$Mod : (56-5-B5/B6/B7) = (56-5-B5/B6/B7+31896+32332)$
R 0269	$Mod : (24105+24215+24588+24794+26925+28238+31283+32090+32635+35649) = (24105+24215+24588+24794+26925+28238+31283+32090+34862+37809) = (24105+24215+24588+24794+26925+28238+31283+32090+32635+35649+34862+37809)$
R 0270	$Mod : (24588+31283) = (25534+31283) = (24215+24588+31283) = (24215+24588+25534+31283)$
0272	$56-5-A1 = 56-5-A3 = 56-5-A4 = 56-5-A5 = 56-5-B4 = 56-5-B5 = 56-5-B6 = 56-5-B7 = V2522A5 = V2524A5 = 2527MA5$
0273	$Mod : (V2522/V2524/2527MA5+20343) = (56-5-A1/A3/A4/A5/B4/B5/B6/B7+20343) = (V2522/V2524/2527MA5+31276) = (56-5-A1/A3/A4/A5/B4/B5/B6/B7+31276) = (V2522/V2524/2527MA5+20343+27498) = (56-5-A1/A3/A4/A5/B4/B5/B6/B7+20343+27498) = (V2522/V2524/2527MA5+31276+27498) = (56-5-A1/A3/A4/A5/B4/B5/B6/B7+31276+27498)$

CODE	DESIGNATION
0274	Mod : $20343 = 31276 = (20343+27498) = (31276+27498)$
0275	Mod : $27498 + (56-5-A1 = 56-5-A3 = 56-5-A4 = 56-5-A5 = 56-5-B4 = 56-5-B5 = 56-5-B6 = 56-5-B7 = V2522A5 = V2524A5 = 2527MA5)$
0276	Mod : $(20343+22013/V2530/V2533) = (31276+22013/V2530/V2533) = (20343+27498+22013/V2530/V2533) = (31276+27498+22013/V2530/V2533) = (20343+22013/B1/B2/B3) = (31276+22013/B1/B2/B3) = (20343+27498+22013/B1/B2/B3) = (31276+27498+22013/B1/B2/B3)$
0277	Mod : $(27498+22013/V2530/V2533) = (27498+22013//B1/B2/B3)$
0279	Mod : $(20268+24946+26965+34041) = (20268+24946+31106+34041) = (20268+27773+31106+32238+34041) = (20268+24946+26965+27773+31106+34041)$
0280	Mod : $(20268+26965+36311+24946) = (20268+27773+36311+24946) = (20268+24946+26965+27773+36311)$
0281	Mod : $(20268+26965+36311+24946) = (20268+27773+36311+24946)$
0282	Mod : $(20268+21678+24946+27773+31106) = (20268+21678+27773+31106+32238) = (20268+21678+27773+31106+32311)$
R 0283	Mod : $(22013+24215+24588+24794+31283+32090) = (24105+24215+24588+24794+31283+32090) = (24215+24588+24794+28160+31283+32090) = (24215+24588+24794+28160+31283+32090+34862+37809) = (22013+24215+24588+24794+31283+32090+34862+37809) = (24105+24215+24588+24794+31283+32090+34862+37809)$
0284	Mod : $(20268+21678+27773+31106+32311) = (20268+21678+24646+27773+31106+32150)$
0286	Mod : $(20268+21678+24044+25404+34818) = (20268+21678+24044+25404+27773+31106+31701)$
0287	Mod : $(20268+21678+25404+25647) = (20268+21678+25404+27773+31106+32311+35040) = (20268+21678+25404+26965+27773+31106+32311+35040) = (20268+21678+24946+25404+27773+31106+25040) = (20268+21678+24946+25647+27773+31106+35040+25404) = (20268+21678+24946+25647+27773+31106+32150+35040+25404)$
0288	Mod : $(20268+21678+24946+25404+27773+28160+31106+34041) = (20268+21678+25404+27773+28160+31106+32238+34041) = (20268+21678+24946+25404+26965+27773+28160+31106+34041)$
R 0289	Mod : $(24105+25819) = (24105+26117)$
R 0290	Mod : $(24215+24588+24794+28378+31283+32090) = (24215+24588+24794+31283+32090+34456) = (22013+24588+24794+28378+31283+32090)$
R 0291	Mod : $(20268+24044+31701) = (20268+24044+34818)$
R 0294	Mod : $(22013+24215+24588+24794+31283+32090) = (24105+24215+24588+24794+31283+32090) = (24215+24588+24794+28160+31283+32090)$
0295	Mod : $(28258+30020) = (30020+30470) = (26438+30020) = (27624+30020) = (23888+30020)$
0296	Mod : $20343 = 31276 = (20343+27498) = (31276+27498)$
0297	Mod : $(28258+20343) = (30470+20343) = (26438+20343) = (27624+20343) = (23888+20343) = (28258+31276) = (30470+31276) = (26438+31276) = (27624+31276) = (23888+31276) = (28258+20343+27498) = (30470+20343+27498) = (26438+20343+27498) = (27624+20343+27498) = (23888+30343+27498) = (28258+31276+27498) = (30470+31276+27498) = (26438+31276+27498) = (27624+31276+27498) = (23888+32176+27498)$
R 0298	Mod : $(22013+24215+24588+24794+30422+32090)$
R 0299	Mod : $(24105+24215+24588+24794+32090) = (24215+24588+24794+28160+32090)$

CODE	DESIGNATION
R 0300	Mod : $(23888+27498) = (26438+27498) = (27624+27498) = (28258+27498) = (30470+27498)$
R 0301	Mod : $(25534+32090) = (24215+24588+25534+32090)$
R 0306	Mod : $28258 = 30470 = 26438 = 27624 = 23888$
R 0310	Mod : $(24105+24215+24588+24794+28238+31283+32090) = (24105+24215+24588+24794+28238+31283+32090+34862+37809)$
R 0311	Mod : $(24105+24215+24588+24794+28238+31283+32090+32635) = (24105+24215+24588+24794+28238+31283+32090+32635+34862+37809)$
R 0312	Mod : $(22013+24215+24588+24794+26925+31283+32090) = (24215+24588+24794+26925+28160+31283+32090) = (24105+24215+24588+24794+26925+31283+32090) = (22013+24215+24588+24794+26925+31283+32090+34862+37809)$
R 0313	Mod : $(25534+31283+32090) = (24588+31283+32090) = (24215+25534+31283+32090) = (24215+24588+31283+32090) = (24215+24588+25534+31283+32090) = (25534+31283+32090+34862+37809) = (24215+24588+31283+32090+34862+37809) = (24215+25534+31283+32090+34862+37809)$
R 0314	Mod : $(22013+24588+32090) = (22013+24215+24588+32090) = (24105+24215+24588+32090) = (24215+24588+28160+32090)$
R 0315	Mod : STD = 33497 = $(27620+33497)$
R 0316	Mod : $(20268+56-5-B3) = (20268+31701+56-5-B1) = (20268+34818+56-5-B1)$
R 0317	Mod : $(20268+21678+24044+31701) = (20268+21678+24044+34818)$
R 0318	Mod : $(20268+24044+31701) = (20268+24044+34818)$
R 0319	Mod : $27650 = (27650+33497) = (27620+27650+33497)$
R 0320	Mod : $(27620+27650) = (27620+27650+37285)$
R 0321	Mod : $(22013+25529+30206) = (22013+25529+36136) = (22013+25819+36136) = (22013+26117+36136) = (22013+26270+36136)$
R 0322	Mod : $22013 = (20024+22013) = (22013+34809+37588) = (22013+20024+34809+37588) = (22013+34809+37588+36609) = (22013+34809+37588+36772) = (20024+22013+34809+37588+36609) = (22024+22013+34809+37588+36772)$
R 0323	Mod : STD = $(34809+37588) = (34809+36609+37588) = (34809+36772+37588)$
R 0324	Mod : $20024 = (20024+34809+37588) = (20024+34809+37588+36609) = (20024+34809+37588+36772)$
R 0325	Mod : $25529 = 25819 = 26117 = 26270 = (25529+25819) = (26117+26270)$
R 0326	Mod : $(22013+25529) = (22013+26117) = (22013+26270) = (22013+25819) = (22013+26117+26270)$
R 0327	Mod : $(24105+25529) = (24105+25819) = (24105+26117) = (24105+26270) = (24105+26117+26270) = (24105+25529+25819)$
R 0328	Mod : $36562 = 36609 = 36772 = (34809+36562) = (34809+36609) = (34809+36772)$
R 0329	Mod : $(20268+28342) = (20268+26965+28342) = (20268+28342+31106)$
R 0330	Mod : $20268 = (20268+25800) = (20268+24404) = (20268+24404+25502) = (20268+24404+25800) = (20268+25800+27727) = (20268+24404+25502+25800) = (20268+24404+25800+27727)$

CODE	DESIGNATION
0331	Mod : $(20268+24946+26965+34041) = (20268+24946+27773+34041) = (20268+25951+26965+34041) = (20268+25951+27773+34041) = (20268+26760+26965+34041) = (20268+26760+27773+34041) = (20268+26965+32150+34041) = (20268+26965+32238+34041) = (20268+26965+32239+34041) = (20268+26965+32311+34041) = (20268+27773+32150+34041) = (20268+27773+32238+34041) = (20268+27773+32239+34041) = (20268+27773+32311+34041) = (20268+26965+34041+35040) = (20268+27773+34041+35040)$
R 0332	Mod : $(22013+36562) = (22013+36609) = (22013+36772) = (20024+22013+36562) = (20024+22013+36609) = (20024+22013+36772) = (22013+34313+36562) = (22013+34809+36772) = (22013+20024+34313+36562) = (22013+20024+34809+36609) = (22013+20024+34809+36772)$
R 0333	Mod : $(20024+36562) = (20024+36609) = (20024+36772) = (20024+34313+36562) = (20024+34809+36609) = (20024+34809+36772)$
R 0334	Mod: $(24215+24588+24794+31283+26925+35871+32090)$
R 0335	Mod : $(24215+24588+24794+24215+31283+35871+32090) = (22013+24215+24588+24794+31283+35871+32090) = (24105+24215+24588+24794+31283+35871+32090)$
R 0336	Mod : $(24105+24215+24794+31283+32090+37266) = (24105+24215+24588+24794+31283+32090+37226) = (22013+24215+24588+24794+30422+31283+32090) = (22013+24215+24588+24794+30422+31283+32090+34862+37809)$
R 0337	Mod : $(24105+24215+24588+24794+28238+31283+32090+35871)$
R 0339	Mod : $(23510+31896+36427+36743) = (23510+31897+36427+36743) = (23510+23672+31896+32402+36427+36743) = (23510+23672+31897+32401+36427+36743)$
R 0340	Mod : $21678 = (21678+33100+34856) = (21678+33100+34898) = (21678+33100+34997)$
R 0341	Mod : $33100 = 33300 = (21678+33100) = (21678+33300)$
R 0342	Mod : $(21678+27140) = (21678+27140+33100+34856) = (21678+27140+33100+34898) = (21678+27140+33100+34997)$
R 0343	Mod : $(27140+33100) = (27140+33300) = (21678+27140+33100) = (21678+27140+33300)$
0344	Mod : $(24946+26965) = (24946+27773) = (25951+26965) = (25951+27773) = (26760+26965) = (26760+27773) = (26965+32150) = (26965+32238) = (26965+32239) = (26965+32311) = (27773+32150) = (27773+32238) = (27773+32239) = (27773+32311) = (26965+35040) = (27773+35040)$
0345	Mod : $(20268+27773+31106+32311)$
0346	Mod : $(20268+21678+24946+27773+31106) = (20268+21678+27773+31106+32311)$
0347	Mod : $(20268+21678+24946+25404+27773+31106) = (20268+21678+25404+26965+27773+28160+28917+31106+32311)$
0348	Mod : $(20268+24946+27773+31106) = (20268+27773+31106+32238)$
0350	Mod : $(20268+21678+24946+25404+27773+31106) = (20268+21678+24946+25404+27773+28160+28917+31106)$
R 0351	Mod : $(24215+24588+24794+24215+31283+35871+32090+26925) = (22013+24215+24588+24794+31283+35871+32090+26925) = (24105+24215+24588+24794+31283+35871+32090+26925)$
0352	Mod : $(26526+30020) = (26526+30020+31276) = (26526+27498+30020+31276)$
R 0354	Mod : $35871 = (35871+30020) = (35871+24105+30020) = (35871+36427+31897+32401) = (35871+31896+32402+36427)$
R 0356	Mod : $(24105+35871) = (24105+31897+32401+35871+36427) = (24105+31896+32402+35871+36427)$

CODE	DESIGNATION
0357	Mod : $(20268+24946+27773+31106) = (20268+27773+31106+32311) = (20268+26965+27773+31106+32311)$
0358	Mod : $(20268+27773+31106) = (20268+24946+27773+31106) = (20268+27773+31106+32238)$
0359	Mod : $(20268+24946+27773+31106) = (20268+27773+31106+32311)$
0360	Mod : $(20268+24946+27773) = (20268+27773+32311) = (20268+26965+27773+32311)$
0361	Mod : $(20268+24946+27773) = (20268+27773+32238) = (20268+27773+32311)$
0362	Mod : $(20268+24946+26965) = (20268+24946+27773) = (20268+26760+26965) = (20268+26760+27773) = (20268+26965+32150) = (20268+26965+32238) = (20268+26965+32239) = (20268+26965+32311) = (20268+27773+32150) = (20268+27773+32238) = (20268+27773+32239) = (20268+27773+32311) = (20268+26965+27773+32311)$
R 0363	Mod : $(24105+35871+31896+36427) = (24105+31897+35871+36427) = (24105+31897+32401+35871+36427+37588)$
R 0364	Mod : $(34041+35871) = (34041+31897+32401+35871+36427) = (34041+31896+32402+35871+36427)$
0365	Mod : $(20268+21678+25404+27773+31106+32311) = (20268+21678+25404+27773+28160+28917+31106+32311) = (20268+21678+25404+26965+27773+28160+28917+31106+32311)$
R 0366	Mod : $(20268+24946+27773+31106)$
R 0367	Mod : $(31897+34041+35871+36427) = (31896+34041+35871+36427) = (31897+32401+34041+35871+36427+37588)$
0368	Mod : $(20268+21678+24946+25404+27773+31106)$
0369	Mod : $(20268+21678+24946+25404+27773+28160+31106)$
0370	Mod : $(20268+27773+31106+32311) = (20268+24946+27773+31106+32150) = (20268+26965+27773+31106+32311)$
R 0371	Mod : $(20268+24946+27773) = (20268+27773+32238) = (20268+27773+32311)$
0372	Mod : $(20268+27773+32311) = (20268+24946+27773+32150) = (20268+26965+27773+32311)$
R 0373	Mod : $(31070+35220) = (31105+35220) = (31105+31896+32402+35220+36427) = (31105+31897+32401+35220+36427) = (31070+31897+32401+35220+36427) = (31070+31896+32402+35220+36427)$
R 0374	Mod : $(31105+31896+35220+36427) = (31105+31897+35220+36427) = (31070+31897+35220+36427) = (31070+31897+32401+35220+36427+37588) = (31070+31897+32401+35220+36427+37588)$
R 0377	Mod : $(20081+36136+37986) = (20081+30206+37986)$
R 0379	Mod : $(30020+35220) = (24105+30020+35220)$
R 0380	Mod : $34665+V2522A5+V2524A5+V2527A5+V2530A5+V2533A5+V2527EA5+V2527MA5)$
R 0381	Mod : $(21678+22536+27522+27620+33100+37986) = (21678+23227+27522+27620+33100+37986) = (21678+23227+27522+27620+33300+35865+37986)$
R 0382	STD = Mod : $(27522+28360) = (27620+33497)$
R 0383	Mod : $22536 = 23227 = 23529 = (22536+27522+28360) = (23227+27522+28360) = (22536+27620+33497) = (23227+27620+33497) = (23529+27620+33497)$
0385	Mod : $(20343+26526) = (26526+31276) = (20343+26526+27498) = (26526+27498+31276) = ((26526+27498+31276)+34637)$

CODE	DESIGNATION
R 0386	Mod : $(21678+22536) = (21678+23227) = (21678+23529) = (21678+22536+27522+28360) = (21678+23227+27522+28360) = (21678+23529+27522+28360)$
R 0387	Mod : $(26111+34637) = (26111+26526+34637)$
R 0388	Mod : $(21678+27522) = (21678+27522+28360+38347)$
R 0389	Mod : $34637 = (26526+34637) = (26526+27046+31375+34637)$
R 0390	Mod : $(21678+22536+27522) = (21678+23227+27522) = (21678+23529+27522) = (21678+22536+27522+33100+34856) = (21678+22536+27522+33100+34898) = (21678+22536+27522+33100+34997) = (21678+23227+27522+33100+34856) = (21678+23227+27522+33100+34898) = (21678+23227+27522+33100+34997) = (21678+23529+27522+33100+34856) = (21678+23529+27522+33100+34898) = (21678+23227+27522+33100+34898) = (21678+22536+27522+27620+33497) = (21678+23529+27522+27620+33497) = (21678+22536+27522+28360+38347) = (21678+23227+27522+28360+38347) = (21678+23529+27522+28360+38347)$
R 0391	Mod : $(28258+30020+26526) = (30470+30020+26526) = (26438+30020+26526) = (27624+30020+26526) = (23888+30020+26526) = (26526+27624+30020+31276) = (26526+27498+30020+30470+31276) = (26526+27498+27624+30020+31276) = (26526+27498+30020+31276+34330) = (26526+27498+30020+31276+34332) = (21678+27522+27620+33100+33497) = (21678+27522+33100+28360+38347) = (21678+27522+33300+28360) = (26526+27498+30020+31276+34637+35436)$
0393	$(20268+24946+26925+26965+27773+31106+34041)$
0394	Mod : $34041 = (20268+34041)$
R 0397	Mod : $(21678+22536+27522+27620+33100+35865) = (21678+23227+27522+27620+33100+35865) = (21678+23529+27522+27620+33100+35227) = (21678+23227+27522+27620+33300+35865) = (21678+23529+27522+27620+33100+35865)$
0398	Mod : $(21678+22536+27522+35227) = (21678+23227+27522+35227) = (21678+23529+27522+35227) = (21678+22536+27522+35865) = (21678+23227+27522+35865) = (21678+23529+27522+35865)$

CODE	DESIGNATION
R 0399	$ \begin{aligned} & \text{"Mod : } (25205+35871) = (23885+35871) = (26999+35871) = \\ & (28382+35871) = (30241+35871) = (26485+35871) = (30631+35871) = \\ & (26999+28495+35871) = (24105+23885+35871) = (24105+25205+35871) \\ & = (24105+26485+35871) = (24105+26999+35871) = \\ & (24105+28382+35871) = (24105+30241+35871) = (24105+30631+35871) \\ & = (30020+23885+35871) = (30020+25205+35871) = \\ & (30020+26485+35871) = (30020+26999+35871) = (30020+28382+35871) \\ & = (30020+30241+35871) = (30020+30631+35871) = \\ & (20139+23885+35871) = (20139+25205+35871) = (20139+26485+35871) \\ & = (20139+26999+35871) = (20139+28382+35871) = \\ & (20139+30241+35871) = (20139+30631+35871) = (34041+23885+35871) \\ & = (34041+25205+35871) = (34041+26485+35871) = \\ & (34041+26999+35871) = (34041+28382+35871) = (34041+30241+35871) \\ & = (34041+30631+35871) = (26999+28382+28495+35871) = \\ & (25205+26999+28495+35871) = (26999+28495+30020+35871) = \\ & (26999+28495+24105+35871) = (26999+28495+20139+35871) = \\ & (24105+30020+23885+35871) = (24105+30020+25205+35871) = \\ & (24105+30020+26485+35871) = (24105+30020+26999+35871) = \\ & (24105+30020+28382+35871) = (24105+30020+30241+35871) = \\ & (24105+30020+30631+35871) = (26999+28495+34041+35871) = \\ & (24105+26999+28495+30020+35871) = \\ & (24105+25205+26999+28495+35871) = \\ & (24105+26999+28382+28495+35871) = \\ & (30020+25205+26999+28495+35871) = \\ & (30020+26999+28382+28495+35871) = \\ & (20139+25205+26999+28495+35871) = \\ & (20139+26999+28382+28495+35871) = \\ & (34041+25205+26999+28495+35871) = \\ & (34041+26999+28382+28495+35871) = \\ & (24105+30020+25205+26999+28495+35871) = \\ & (24105+30020+26999+28382+28495+35871) \end{aligned} $
0400	Mod : $(22013+34313) = (22013+34809) = (20024+22013+34313) = (20024+22013+34809)$
0401	Mod : $20024 = (20024+31283+34861) = (20024+31283+34862) = (20024+31283+34864)$
0402	Mod : $22013 = (22013+20024) = (20024+22013+31283+34861) = (20024+22013+31283+34862) = (20024+22013+31283+34864)$
R 0403	Mod : $21678 = (21678+27522+28360) = (21678+28360+38347)$
R 0404	Mod : $\text{STD} = (31283+34864) = (31283+34861) = (31283+34862)$
R 0405	$ \begin{aligned} & \text{Mod : } (21678+22536+27620) = (21678+23227+27620) = \\ & (21678+23529+27620) = (21678+23227+27620+37285) = \\ & (21678+23529+27620+37285) = \\ & (21678+22536+27620+33497+37285) = \\ & (21678+23227+27620+33497+37285) = \\ & (21678+23529+27620+33497+37285) \end{aligned} $
R 0406	$ \begin{aligned} & \text{Mod : } (21678+22536+27522+33100) = (21678+22536+27522+33300) = \\ & (21678+23529+27522+33100) = (21678+23529+27522+33300) = \\ & (21678+23227+27522+33100) = (21678+23227+27522+33300) = \\ & (21678+22536+27522+27620+33100+33497) = \\ & (21678+23227+27522+27620+33100+33497) = \\ & (21678+23529+27522+27620+33100+33497) = \\ & (21678+23529+27522+27620+33300+33497) = \\ & (21678+23227+27522+27620+33300+33497) = \\ & (21678+22536+27522+27620+33300+33497) = \\ & (21678+22536+27522+27620+33300+33497) \end{aligned} $
0407	Mod : $(30020+26925) = (24105+30020+26925)$
0408	Mod : $20268 = (20268+26999+28495)$
0409	Mod : $(25205+20268) = (23885+20268) = (26999+20268) = (28382+20268) = (30241+20268) = (26485+20268) = (30631+20268) = (26999+28382+28495+20268) = (25205+26999+28495+20268)$
0410	Mod : $25205 = 23885 = 26999 = 28382 = 30241 = 26485 = 30631 = (26999+28382+28495) = (25205+26999+28495)$

CODE	DESIGNATION
0411	$''(CFM \text{ Eng. } 56-5-B1+20268+31701+25205) = (CFM \text{ Eng. } 56-5-B1+20268+31701+23885) = (CFM \text{ Eng. } 56-5-B1+20268+31701+26999) = (CFM \text{ Eng. } 56-5-B1+20268+31701+28382) = (CFM \text{ Eng. } 56-5-B1+20268+31701+30241) = (CFM \text{ Eng. } 56-5-B1+20268+31701+26485) = (CFM \text{ Eng. } 56-5-B1+20268+31701+30631) = (CFM \text{ Eng. } 56-5-B1+20268+31701+26999+28382+28495) = (CFM \text{ Eng. } 56-5-B1+20268+31701+25205+26999+28495) = (CFM \text{ Eng. } 56-5-B1+20268+34818+25205) = (CFM \text{ Eng. } 56-5-B1+20268+34818+23885) = (CFM \text{ Eng. } 56-5-B1+20268+34818+26999) = (CFM \text{ Eng. } 56-5-B1+20268+34818+28382) = (CFM \text{ Eng. } 56-5-B1+20268+34818+30241) = (CFM \text{ Eng. } 56-5-B1+20268+34818+26485) = (CFM \text{ Eng. } 56-5-B1+20268+34818+30631) = (CFM \text{ Eng. } 56-5-B1+20268+34818+26999+28382+28495) = (CFM \text{ Eng. } 56-5-B1+20268+34818+25205+26999+28495) = (CFM \text{ Eng. } 56-5-B3+20268+25205) = (CFM \text{ Eng. } 56-5-B3+20268+23885) = (CFM \text{ Eng. } 56-5-B3+20268+26999) = (CFM \text{ Eng. } 56-5-B3+20268+30241) = (CFM \text{ Eng. } 56-5-B3+20268+26485) = (CFM \text{ Eng. } 56-5-B3+20268+30631) = (CFM \text{ Eng. } 56-5-B3+20268+26999+28382+28495) = (CFM \text{ Eng. } 56-5-B3+20268+25205+26999+28495) = (CFM \text{ Eng. } 56-5-B1+(20268+31701+26999+28495)=(20268+34818+26999+28495))''$
0412	$''(CFM \text{ Eng. } 56-5-B3+20268) = (CFM \text{ Eng. } 56-5-B1+20268+31701) = (CFM \text{ Eng. } 56-5-B1+20268+34818) = (CFM \text{ Eng. } 56-5-B3+20268+26999+28495) = (CFM \text{ Eng. } 56-5-B1+(20268+31701+26999+28495)=(20268+34818+26999+28495))''$
0413	Mod : $(20343+26526) = (26526+31276) = (20343+26526+27498) = (26526+27498+31276) = (26526+27498+31276+34637)$
R 0414	Mod : $(21678+22536+27522+27620) = (21678+23227+27522+27620) = (21678+23529+27522+27620) = (21678+22536+27522+27620+33100+34856) = (21678+22536+27522+27620+33100+34898) = (21678+23227+27522+27620+33100+34898) = (21678+23227+27522+27620+33100+34856) = (21678+23529+27522+27620+33100+34856) = (21678+22536+27522+27620+33497+37285) = (21678+23227+27522+27620+33497+37285) = (21678+23227+27522+27620+37285) = (21678+23529+27522+27620+37285) = (21678+22536+27522+27620+37285) = (21678+23529+27522+27620+33497+37285)$
R 0415	Mod : $(21678+27522+27620+33100) = (21678+27522+27620+33100+37285) = (21678+27522+27620+33100+33497+37285)$
R 0416	Mod : $(24946+27773) = (24946+31106)$
R 0417	Mod : $(21678+23529+27522+27620+35227) = (21678+22536+27522+27620+35227) = (21678+22536+27522+27620+35865) = (21678+22536+27522+27620+28360+35227+38347) = (21678+22536+27522+27620+28360+35865+38347) = (21678+23227+27522+27620+28360+35227+38347) = (21678+23227+27522+27620+28360+35865+38347) = (21678+23529+27522+27620+28360+35227+38347) = (21678+23529+27522+27620+28360+35865+38347) = (21678+23529+27522+27620+35865) = (21678+23227+27522+27620+35227) = (21678+23227+27522+27620+35865) = (21678+22536+27522+27620+33497+35227+37285) = (21678+22536+27522+27620+33497+35865+37285) = (21678+23227+27522+27620+33497+35227+37285) = (21678+23227+27522+27620+33497+35865+37285) = (21678+23529+27522+27620+33497+35227+37285) = (21678+23529+27522+27620+33497+35865+37285)$

CODE	DESIGNATION
R 0418	Mod : $(21678+22536+27522+27620+33100) =$ $(21678+22536+27522+27620+33300) =$ $(21678+23227+27522+27620+33100) =$ $(21678+23227+27522+27620+33300) =$ $(21678+23529+27522+27620+33100) =$ $(21678+23529+27522+27620+33300) =$ $(21678+23227+27522+27620+33100+33497+37285) =$ $(21678+23227+27522+27620+33300+33497+37285) =$ $(21678+22536+27522+27620+33100+33497+37285) =$ $(21678+22536+27522+27620+33300+33497+37285) =$ $(21678+23529+27522+27620+33100+33497+37285) =$ $(21678+23529+27522+27620+33300+33497+37285) =$
R 0419	Mod : $35871 = (20268+35871) = (20268+31701+35871) =$ $(20268+34818+35871) = (20268+36311+35871) =$ $(20268+36297+35871)$
R 0420	Mod : $STD = 34637 = (28916+34637) = (26999+28495) =$ $(26526+26999+28495) = (26526+26999+28479+28495)$
0422	Mod : $STD = (31283+34864) = (31283+34861) = (31283+34862) =$ $(30368+35270) = (30368+35270+31283+34862)$
0423	Mod : $30368 = (30368+31283+34861) = (30368+31283+34862) =$ $(30368+31283+34864)$
0424	Mod : $(24645+28479) = (24645+28702) = (24645+28916) =$ $(24645+31283+34862) = (24645+31283+34861)$
R 0425	Mod : $(25205+26526+28916) = (26111+26526+28916) =$ $(26526+26999+28479) = (26526+26999+28702) =$ $(26526+28382+28916) = (26526+28916+30631) =$ $(26526+28916+30635) = (26526+26999+28916) =$ $(26526+26999+28382+28479) = (26526+26999+28382+28702) =$ $(26526+26999+28382+28495+28479) =$ $(25205+26526+26999+28479+28495) =$ $(26526+26999+28382+28495+28702) =$ $(26526+26999+28382+28495+28916)$
R 0426	Mod : $(26485+28916+34637) = (26526+26999+28479+34637) =$ $(26526+26999+28382+28479+34637) =$ $(26526+26999+28382+28479+28495+35637)$
0427	Mod : $(24105+25819+28238) = (24105+26270+28238) =$ $(24105+26117+28238) = (24105+25529+28238)$
0428	Mod : $24771 = (24771+33100+34856) = (24771+33100+34898)$
R 0429	Mod : $35871 = (35871+36427) = (31105+35220+35871) =$ $(31070+35220+35871) = (30020+31070+35220+35871) =$ $(30020+31105+35220+35871) = (31105+35220+35871+36427) =$ $(31070+35220+35871+36427) =$ $(30020+31070+35220+35871+36427) =$ $(30020+31105+35220+35871+36427) =$ $(31070+31896+32402+35220+35871+36427) =$ $(31105+31896+32402+35220+35871+36427)$
R 0430	Mod : $STD = 20151 = (31495+35270) = (20063+20151) =$ $(20063+23092) = (20063+31112) = (22562+25072) =$ $(20151+22562+25888) = (20151+22562+25072) =$ $(20063+22562+25072) = (20063+22562+25888) =$ $(20151+22562+37987) = (20063+22562+37987) =$ $(20063+20151+31495+35270) = (20063+20151+22562+25888) =$ $(20063+20151+22562+25072) =$ $(20063+20151+25888+31495+35270+35864)$
R 0431	Mod : $(20268+20139+21678+24946+27773+31106)$
R 0432	Mod : $22562 = (20063+22562) = (20151+22562) =$ $(20063+20151+22562) = (22562+31495+35270) =$ $(22562+25888+27609) = (20063+22562+31495+35270) =$ $(20063+31495+35270+35864) =$ $(20063+20151+31495+35270+35864) =$ $(20063+22562+31495+35270+35864) =$ $(20063+20151+22562+25888+27609)$

CODE	DESIGNATION
R 0433	Mod : $22013 = (22013+31495+35270) = (20063+20151+22013+31495+35270) = (20063+22013) = (22013+23092) = (20063+20151+2013) = (20063+22013+23092) = (20063+22013+22562+25888) = (20063+22013+22562+25072) = (20063+22013+22562+37987) = (20151+22013+22562+25072)$
R 0434	Mod : $(24946+27773) = (24946+31106)$
R 0435	Mod : $(22013+22562) = (22013+22562+31495+35270) = (20063+22013+22562) = (20151+22013+22562) = (20063+20151+22013+22562) = (22013+22562+25888+27609) = (20063+22013+22562+25888+27609)$
R 0436	Mod : $(20063+31495) = (20063+25888+31495+35864)$
R 0437	Mod : $(20151+31495) = (31112+31495) = (31495+23062) = (20063+20151+31495) = (20063+31112+31495) = (20063+20151+25888+31495+35864) = (20063+25888+31112+31495+35864)$
0438	Mod : $(20268+21678+24946+25404+28160+31106)$
0439	$(20268+21678+31106+32239) = (20268+21678+31106+32311) = (20268+21678+25951+27773+31106) = (20268+21678+31106+32311+27773)$
0440	Mod : $(20268+21678+25404+28342) = (20268+21678+25404+28342+31106)$
0441	Mod : $(20268+21678+24946+25404+25647+31106) = (20268+21678+24946+25404+25647+28160+28917+31106)$
0442	Mod : $(20139+20268+24946+27773+31106)$
R 0443	Mod : $(20063+22013+31495) = (20063+22013+22562+25888+31495) = (20063+22013+25888+31495+35864)$
R 0444	Mod : $(22151+22013+31495) = (22013+31112+31495) = (22013+23092+31495) = (20063+20151+22013+31495) = (20063+22013+31112+31495) = (20063+20151+22013+25888+31495+35864) = (20063+22013+25888+31112+31495+35864)$
R 0445	Mod : $(24215+24588+24794) = (24215+24588+24794+28160+28917) = (24215+24588+24794+28160+28917+31283+34864)$
R 0446	Mod : $(22013+24215+24794) = (22013+24215+24588+24794) = (24105+24215+24588+24794) = (24215+24588+24794+28160) = (24215+24588+24794+28160+31283+34861) = (24215+24588+24794+28160+31283+34862) = (22013+24215+24588+24794+31283+34864) = (24105+24215+24588+24794+31283+34862)$
R 0447	Mod : $(24215+24588+24794+28378) = (24215+24588+24794+34456)$
R 0448	Mod : $25206 = 23885 = 26999 = 28382 = 30241 = 26485 = 30631 = (26999+28382+28495) = (25205+26999+28495) = (20063+22013+22562+25888+27609+31495)$
R 0449	Mod : $(24215+24588+24794+26925+31283+32090) = (24215+24588+24794+26925+31283+32090+34862+37809)$
R 0450	Mod : $(22013+24215+24588+24794+26925+31283+32090) = (24105+24215+24588+24794+26965+31283+32090) = (24215+24588+24794+26935+28160+31283+32090) = (22013+24215+24588+24794+26925+31283+32090+34862+37809) = (24105+24215+24588+24794+26925+31283+32090+34862+37809) = (24215+24588+24794+26925+28160+31283+32090+34862+37809)$
R 0451	Mod : $(20151+22013+22562+31495) = (22013+22562+23092+31495) = (22013+22562+31112+31495) = (20063+20151+22013+22562+31495) = (20063+20151+22013+31495+35864) = (20063+20151+22013+22562+31495+35864) = (20063+20151+22013+31112+31495+35864) = (20063+22013+31112+31495+35864)$
R 0452	Mod : $(34665+37147) = (34665+38573)$

CODE	DESIGNATION
0453	Mod : $(24105 + 24215 + 24588 + 24794 + 26925 + 28238 + 31283 + 32090 + 32635) = (24105 + 24215 + 24588 + 24794 + 26925 + 28238 + 31283 + 32090 + 32635 + 34862 + 37809)$
0456	Mod : $(20268 + 24946 + 26965) = (20268 + 24946 + 27773) = (20268 + 26760 + 26965) = (20268 + 26760 + 27773) = (20268 + 26965 + 32150) = (20268 + 26965 + 32238) = (20268 + 26965 + 32239) = (20268 + 26965 + 32311) = (20268 + 27773 + 32150) = (20268 + 27773 + 32238) = (20268 + 27773 + 32239) = (20268 + 27773 + 32311) = (20268 + 26965 + 27773)$
0457	Mod : $(20268 + 24946 + 26965) = (20268 + 24946 + 27773) = (20268 + 26760 + 26965) = (20268 + 26760 + 27773) = (20268 + 26965 + 32150) = (20268 + 26965 + 32238) = (20268 + 26965 + 32239) = (20268 + 26965 + 32311) = (20268 + 27773 + 32150) = (20268 + 27773 + 32238) = (20268 + 27773 + 32239) = (20268 + 27773 + 32311)$
0458	Mod : $(20268 + 24946 + 26965) = (20268 + 24946 + 27773) = (20268 + 26760 + 26965) = (20268 + 26760 + 27773) = (20268 + 26965 + 32150) = (20268 + 26965 + 32238) = (20268 + 26965 + 32239) = (20268 + 26965 + 32311) = (20268 + 27773 + 32150) = (20268 + 27773 + 32238) = (20268 + 27773 + 32239) = (20268 + 27773 + 32311) = (20268 + 26965 + 27773 + 32311)$
0459	Mod : $20059 = (20059 + 31276 + 32013)$
0460	Mod : $(20057 + 20059) = (20057 + 20059 + 31276 + 32013)$
0461	Mod : $(20057 + 20343) = (20057 + 31276) = (20057 + 20343 + 31276)$
R 0462	Mod : $(30020 + 31070 + 35220) = (30020 + 31105 + 35220)$
R 0463	Mod : $(20057 + 20059 + 20343) = (20057 + 20059 + 31276) = (20057 + 20059 + 20343 + 31276)$
R 0464	Mod : $(20268 + 25647 + 26965) = (20268 + 25647 + 31106)$
R 0465	Mod : $(20268 + 26965) = (20268 + 31106)$
R 0466	Mod : $20057 = (20057 + 31276 + 32013)$
R 0475	Mod : $(24105 + 24215 + 24588 + 24794 + 28382 + 31283) = (24105 + 24215 + 24588 + 24794 + 28238 + 31283 + 34862 + 37809)$
R 0476	Mod : $(22013 + 24215 + 24588 + 31283 + 32090) = (22013 + 24215 + 24588 + 31283 + 32090 + 34862 + 37809)$
R 0478	Mod : $(22013 + 24215 + 24588 + 24794 + 30422) = (24215 + 24588 + 24794 + 28160 + 34456) = (24215 + 24588 + 24794 + 28160 + 28378) = (24105 + 24215 + 24588 + 24794 + 37226)$
R 0480	Mod : $(24404 + 34665) = (24405 + 34665) = (25530 + 34665) = (27640 + 34665)$
R 0481	Mod : $(23510 + 31896) = (23510 + 31897) = (23510 + 32401) = (23510 + 32475) = (23510 + 32929) = (23510 + 32402) = (23672 + 31896) = (23672 + 31897) = (23672 + 32401) = (23672 + 32475) = (23672 + 32929) = (23612 + 32402) = (23510 + 35119) = (23672 + 35119) = (23510 + 31896 + 32332 + 35119) = (23672 + 31896 + 32332 + 35119) = (31897 + 32333 + 32929 + 23510) = (31896 + 32332 + 32475 + 23510) = (31897 + 32333 + 32929 + 23672) = (31896 + 32332 + 32475 + 23672)$
R 0482	Mod : $35119 = 31896 = 31897 = 32401 = 32402 = 32475 = 32929 = (31896 + 32332) = (31897 + 32333) = (31896 + 32332 + 35119) = (31896 + 32332 + 32475) = (31897 + 32333 + 32929)$
R 0483	Mod : $BMA = (MSN 0815 = 0841 = 0926 = 0991 = 1023 = 1094 = 1242 = 1394 = 1443 = 1443 = 1467 = 2191 = 2206 = 2217 = 2250 = 2256 = 2272 = 2294 = 2364 = 2374 = 2399 = 2409 = 2411 = 2432 = 2486 = 2542 = 2583 = 2635 = 2810 = 3129 = 3136)$
R 0484	Mod : $MSN 0815 = 0841 = 0926 = 0991 = 1023 = 1094 = 1242 = 1394 = 1443 = 1443 = 1467 = 2191 = 2206 = 2217 = 2250 = 2256 = 2272 = 2294 = 2364 = 2374 = 2399 = 2409 = 2411 = 2432 = 2486 = 2542 = 2583 = 2635 = 2810 = 3129 = 3136$

CODE	DESIGNATION
R 0485	Mod : $(20268+26999) = (20268+25205) = (23885+20268) = (28382+20268) = (30241+20268) = (26485+20268) = (30631+20268) = (26999+28382+28495+20268) = (25205+26999+28495+20268)$
R 0490	MSN : $0069 = 0070 = 0071 = 0072 = 0078 = 0083 = 0086 = 0093 = 0094 = 0104 = 0110 = 0116 = 0117 = 0135 = 0137 = 0147 = 0161 = 0162 = 0172 = 0200 = 0201 = 0202 = 0209 = 0216 = 0217 = 0218 = 0267 = 0268 = 0269 = 0346 = 0382 = 0401 = 0412 = 0458 = 0468 = 0473 = 0474 = 0484 = 0493 = 0502 = 0505 = 0518 = 0560 = 0563 = 0564 = 0567 = 0595$
R 0491	Mod : $(22013+24215+24588+24794+26925+30422+31283+32090) = (24105+24215+24588+24794+26925+31283+32090+33973) = (24215+24588+24794+26925+28160+28378+31283+32090) = (24105+24215+24588+24794+26925+31283+32090+37226) = (22013+24215+24588+24794+26925+30422+31283+32090+34862+37809) = (24105+24215+24588+24794+26925+31283+32090+33973+34862+37809) = (24215+24588+24794+26925+31283+32090+34862+37809) = (24105+24215+24588+24794+26925+31283+32090+37226+34862+37809)$
R 0492	Mod : $(22013+31283) = (20024+22013+31283) = (22013+31283+34862+37809) = (20024+22013+31283+34862+37809)$
R 0493	Mod : $(20024+31283) = (20024+31283+34862+37809)$
R 0494	Mod : $31283 = (30368+35270+31283) = (31283+34862+37809) = (30368+35270+31283+34862+37809)$
R 0495	Mod : $(30368+31283) = (30368+31283+34862+37809)$
R 0496	Mod : $(24645+26925+31283) = (24645+26925+31283+34862+37809)$
R 0497	Mod : $(24645+26925+31283+34041) = (24645+26925+31283+34041+34862+37809)$
R 0498	Mod : $(22013+24645+26925+31283) = (22013+24645+26925+31283+34862+37809)$
R 0499	Mod : $(24105+24645+26925+31283) = (24105+24645+26925+31283+34862+37809)$
R 0500	Mod: $(24645+26925+30020+31283) = (24105+24645+26925+30020+31283) = (24645+26925+30020+31283+34862+37809) = (24105+24645+26925+30020+31283+34862+37809)$
R 0503	Mod : $20268 = (20268+26925+26965+27773+31106+32311+35040)$
R 0504	Mod : $(20268+26925+26965+28342) = (20268+26925+26965+27773+31106+32311+35040)$
R 0505	Mod : $(20268+24044+31607+26925)$
R 0506	Mod : $STD = 26963 = 28377 = 28667 = (25419+26963) = (25419+28377) = (25419+28667) = (25419+28667) = (25419+26963+27992+28377)$
R 0507	Mod : $22013 = 24105 = 24701 = (22013+26963) = (22013+28377) = (22013+28667) = (24105+26963) = (24105+2837) = (24105+28667) = (24701+26963) = (24701+28377) = (24701+28667) = (22013+25419+26963) = (22013+25419+28377) = (22013+25419+28667) = (24105+25419+26963) = (24105+25419+28667) = (24701+25419+26963) = (24701+25419+28377) = (24701+25419+28667) = (22013+25419+26963+27992+28377) = (24105+25419+26963+27992+28377) = (24701+25419+26963+27992+28377) = (24701+25419+26963+28377+33497)$
R 0508	Mod : $25419 = 27992 = (25419+26963+27992)$
R 0509	Mod : $(22013+25419) = (24105+25419) = (24701+25419) = (22013+27992) = (24105+27992) = (24701+27992) = (22013+25419+26963+27992) = (24105+25419+26963+27992) = (24701+25419+26963+27992)$

CODE	DESIGNATION
R 0510	Mod : $(22013 + 25419 + 26925) = (24105 + 25419 + 26925) = (24701 + 25419 + 26925) = (22013 + 27992 + 26925) = (24105 + 27992 + 26925) = (22013 + 25419 + 26925 + 26963 + 27992) = (24105 + 25419 + 26925 + 26963 + 27992) = (24701 + 25419 + 26925 + 26963 + 27992)$
R 0512	Mod : $25529 = 25819 = 26117 = 26270 = (25529 + 25819) = (25529 + 26117) = (25819 + 26117) = (26117 + 26270) = (25529 + 25819 + 26117)$
R 0513	Mod : $25529 = 25819 = 26117 = 26270 = (25529 + 25819) = (26117 + 26270)$
R 0514	Mod : $(20268 + 24946 + 26925 + 26965 + 36311/B6) = (20268 + 24946 + 26925 + 27773 + 36311/B6) = (20268 + 24946 + 26925 + 31106 + 36311/B6) = (20268 + 24946 + 26925 + 26965 + 36297/B5) = (20268 + 24946 + 26925 + 27773 + 36297/B5) = (20268 + 24946 + 26925 + 31106 + 36297/B5)$
R 0515	Mod : $(20268 + 26965 + 36311 + 24946/B6) = (20268 + 27773 + 36311 + 24946/B6) = (20268 + 31106 + 36311 + 24946/B6) = (20268 + 26965 + 36297 + 24946/B5) = (20268 + 27773 + 36297 + 24946/B5) = (20268 + 31106 + 36297 + 24946/B5)$
R 0516	Mod : STD = $(32401 + 35651) = (32929 + 37588) = (32401 + 37588)$
R 0518	"Mod : $20057 = (20057 + 25888 + 27609) = (20057 + 27609 + 37987)$ "
R 0519	Mod : $(21678 + 22536 + 27522 + 33100 + 35227) = (21678 + 22536 + 27522 + 33300 + 35227) = (21678 + 23529 + 27522 + 33100 + 35227) = (21678 + 23529 + 27522 + 33300 + 35227) = (21678 + 22536 + 27522 + 33100 + 35865) = (21678 + 22536 + 27522 + 33300 + 35865) = (21678 + 23529 + 27522 + 33100 + 35865) = (21678 + 23529 + 27522 + 33300 + 35865) = (21678 + 23227 + 27522 + 33100 + 35865) = (21678 + 22536 + 27522 + 27620 + 33100 + 33497 + 35865)$
R 0522	Mod : $(21678 + 26925 + 26999 + 27620) = (21678 + 26925 + 26999 + 27620 + 27646) = (21678 + 26925 + 26999 + 27620 + 37285) = (21678 + 26999 + 26925 + 27620 + 33503 + 37589) = (21678 + 26925 + 26999 + 27620 + 27646 + 33503 + 37589)$
R 0523	Mod : $(21678 + 26925 + 26999 + 27531 + 27620) = (21678 + 26925 + 26999 + 27531 + 27620 + 37285) = (21678 + 26925 + 26999 + 27531 + 27620 + 33503 + 37589)$
R 0524	Mod : $(20268 + 56-5-A1/A3/B4+L) = (20268 + 36311 + 56-5-B6+L)$
R 0527	Mod : $(20081 + 30206) = (20081 + 36136)$
R 0528	MSN : $1071 = 1078 = 1090 = 1091 = 1126 = 1129 = 1131 = 1149 = 1164 = 1167$

CODE	DESIGNATION
R 0529	<p>Mod : $(25205 + 35871) = (23885 + 35871) = (26999 + 35871) =$ $(28382 + 35871) = (30241 + 35871) = (26485 + 35871) =$ $(30631 + 35871) = (26999 + 28382 + 28495 + 35871) =$ $(25205 + 28495 + 26999 + 35871) = (25205 + 20268 + 35871) =$ $(23885 + 20268 + 35871) = (26999 + 20268 + 35871) =$ $(28382 + 20268 + 35871) = (28382 + 20268 + 35871) =$ $(30241 + 20268 + 35871) = (26485 + 20268 + 35871) =$ $(30631 + 20268 + 35871) = (20268 + 31701 + 35871) =$ $(20268 + 34818 + 35871) = (20268 + 35871 + 36311) =$ $(20268 + 35871 + 36297) = (26999 + 28382 + 28495 + 20268 + 35871) =$ $(25205 + 26999 + 28495 + 20268 + 35871) =$ $(20268 + 26999 + 28495 + 31701 + 35871) =$ $(20268 + 26999 + 28495 + 34818 + 35871) =$ $(20268 + 26999 + 28495 + 36311 + 35871) =$ $(20268 + 26999 + 28495 + 36297 + 35871) =$ $(20268 + 31701 + 25205 + 35871) = (20268 + 31701 + 23885 + 35871) =$ $(20268 + 31701 + 26999 + 35871) = (20268 + 31701 + 28382 + 35871) =$ $(20268 + 31701 + 30241 + 35871) = (20268 + 31701 + 30631 + 35871) =$ $(20268 + 23885 + 35871 + 36311) = (20268 + 25205 + 35871 + 36311) =$ $(20268 + 26999 + 35871 + 36311) = (20268 + 28382 + 35871 + 36311) =$ $(20268 + 30241 + 35871 + 36311) = (20268 + 26485 + 35871 + 36311) =$ $(20268 + 30631 + 35871 + 36311) = (20268 + 23885 + 35871 + 36297) =$ $(20268 + 25205 + 35871 + 36297) = (20268 + 26999 + 35871 + 36297) =$ $(20268 + 28382 + 35871 + 36297) = (20268 + 30241 + 35871 + 36297) =$ $(20268 + 26485 + 35871 + 36297) = (20268 + 30631 + 35871 + 36297) =$ $(20268 + 31701 + 26999 + 28382 + 28495 + 35871) =$ $(20268 + 31701 + 25205 + 26999 + 28495 + 35871) =$ $(20268 + 34818 + 25205 + 35871) = (20268 + 34818 + 23885 + 35871) =$ $(20268 + 34818 + 26999 + 35871) = (20268 + 34818 + 28382 + 35871) =$ $(20268 + 34818 + 30241 + 35871) = (20268 + 34818 + 26485 + 35871) =$ $(20268 + 34818 + 30631 + 35871) =$ $(20268 + 34818 + 26999 + 28382 + 28495 + 35871) =$ $(20268 + 34818 + 25205 + 26999 + 28495 + 35871) =$ $(20268 + 25205 + 26999 + 28495 + 36311 + 35871) =$ $(20268 + 26999 + 28382 + 28495 + 36311 + 35871)$ </p>
R 0531	<p>Mod : $(25529 + 35871) = (25819 + 35871) = (26117 + 35871) =$ $(26270 + 35871) = (25819 + 26117 + 35871)$</p>
R 0532	<p>Mod : $(35871 + 31897 + 36427) = (35871 + 31896 + 36427) =$ $(31897 + 32401 + 35871 + 36427 + 37588) =$ $(24105 + 30020 + 31897 + 35871 + 36427) =$ $(30020 + 31897 + 32401 + 36427 + 35871 + 37588) =$ $(24105 + 30020 + 31897 + 32401 + 35871 + 36427 + 37588)$</p>
R 0533	<p>Mod : $(28258 + 26526) = (30470 + 26526) = (26438 + 26526) =$ $(27624 + 26526) = (23888 + 26526) = (26526 + 35436)$</p>
R 0534	<p>$(28258 + 27498 + 26526) = (30470 + 27498 + 26526) = (26438 + 27498 + 26526)$ $= (27624 + 27498 + 26526) = (23888 + 27498 + 26526) =$ $(26526 + 27498 + 35436)$</p>

CODE	DESIGNATION
R 0535	Mod : $(28258+30020+26526) = (30470+30020+26526) =$ $(26438+30020+26526) = (27624+30020+26526) =$ $(23888+30020+26526) = (26526+27624+30020+31276) =$ $(26526+27498+30020+30470+31276) =$ $(26526+27498+27624+30020+31276) =$ $(26526+27498+30020+31276+34330) =$ $(26526+27498+30020+31276+34332) =$ $(26526+37498+31276+30020+34334) =$ $(26526+27498+30020+31276+34637+35436)$
R 0536	Mod : $(21678+26999+27620) = (21678+27620+27646) =$ $(21678+26999+27620+37285)$
R 0537	Mod : $(21678+26485+26925) = (21678+26999+26925) =$ $(21678+27646+26925) = (21678+30631+26925) =$ $(21678+30635+26925) = (21678+26999+33497+26925) =$ $(21678+26925+26999+27646) =$ $(21678+26999+27620+33497+26925) =$ $(21678+26999+27646+33497+26925) =$ $(21678+26925+26999+27620+33497+33503+37589) =$ $(21678+26925+26999+27620+27646+33497+33503+37589)$
R 0538	Mod : $(21678+26925+26999+33503) =$ $(21678+26925+26999+27620+33497+33503)$
R 0539	Mod : $(21678+26925+26999+27620+33503) =$ $(21678+26925+26999+27620+27646+33503)$
R 0540	Mod : $(21678+26925+26999+27531+27620+33503)$
R 0543	Mod : $(20268+24044+37858+25404+21678)$
R 0544	Mod : $(20268+24044+37858+21678+25404+37999)$
R 0545	Mod : $20268+21678+24946+25404+27773 =$ $(20268+21678+25404+31106+32239) =$ $(20268+21678+25404+31106+32311) =$ $(20268+21678+25404+31106+27773+32239) =$ $(20268+21678+25404+27773+31106+32311) =$ $(20268+21678+25404+28160+28917+31106+32311) =$ $(20268+21678+25404+27773+31106+32311+28160+28917)$
R 0546	Mod : $(20268+21678+24946+25404+28160+31106) =$ $(20268+21678+25404+28160+31106+32311) =$ $(20268+21678+25404+27773+28160+31106+32238) =$ $(20268+21678+24946+25404+26965+27773+28160+31106+321106) =$ $(20268+21678+25404+26965+27773+28160+31106+32311)$
R 0547	Mod : $(36847+56-5-B5/B6/B7/B8/B9) = (28160+36847+56-5-B4) =$ $(20268+21678+25404+25647+27773+28160+31106+32311+56-5-B4)$
R 0548	Mod : $(20268+21678+25404+25647+27773+31106+32311)$
R 0549	Mod : $(22013+26925) = (24105+26925) = (24701+26925) =$ $(22013+26963+26925) = (22013+28377+26925) =$ $(22013+28667+26925) = (24105+26963+26925) =$ $(24105+28377+26925) = (24105+28667+26925) =$ $(24701+26963+26925) = (24701+28377+26925) =$ $(24701+28667+26925) = (22013+25419+26963+26925) =$ $(22013+25419+28377+26925) = (22013+25419+28667+26925) =$ $(24105+25419+26963+26925) = (24105+25419+28377+26925) =$ $(24105+25419+28667+26925) = (24701+25419+26963+26925) =$ $(24701+25419+28377+26925) = (24701+25419+28667+26925) =$ $(22013+25419+26963+27992+28377+26925) =$ $(24105+25419+26963+27992+28377+26925) =$ $(24701+25419+26963+27992+28377+26925) =$ $(24701+25419+26925+26963+28377+28667+33497)$
R 0550	Mod : $(20268+24044+37858+26925) =$ $(20268+24044+26925+27773+31106+37858)$
R 0551	Mod : $(20268+24044+26925+27773+31106+31701) =$ $(20268+24044+26925+27773+31106+34818)$
R 0552	Mod : $(20268+24044+26925+27773+31106+31702)$

CODE	DESIGNATION
R 0553	Mod: $(20268 + 24946 + 26925 + 26965) = (20268 + 24946 + 26925 + 27773) =$ $(20268 + 25951 + 26925 + 26965) = (20268 + 25951 + 26925 + 27773) =$ $(20268 + 26760 + 26925 + 26965) = (20268 + 26760 + 26925 + 27773) =$ $(20268 + 26925 + 26965 + 32150) = (20268 + 26925 + 26965 + 32238) =$ $(20268 + 26925 + 26965 + 32239) = (20268 + 26925 + 26965 + 32311) =$ $(20268 + 26925 + 27773 + 32150) = (20268 + 26925 + 27773 + 32238) =$ $(20268 + 26925 + 27773 + 32239) = (20268 + 26925 + 27773 + 32311) =$ $(20268 + 26925 + 27773 + 31106 + 32311 + 35040)$
R 0554	Mod : $(20268 + 25647 + 26925 + 26965 + 27773 + 31106 + 32311 + 35040)$
R 0555	Mod : $(20268 + 25647 + 26925 + 26965 + 27773 + 31106 + 32311)$
R 0556	Mod : $(20268 + 24946 + 26925 + 27773 + 31106 + 28342)$
R 0557	Mod : $(26925 + 30020 + 35871) = (24105 + 26925 + 30020 + 35871)$
R 0558	Mod : $(20268 + 24946 + 27773 + 31106 + 28342)$

CODE	DESIGNATION
R 0559	<p>Mod : $(20268+25647+26965) = (20268+25647+27773) =$ $(20268+24946+25647+26965) = (20268+24946+25647+27773) =$ $(20268+25647+25951+26965) = (20268+25647+25951+27773) =$ $(20268+25647+26760+26965) = (20268+25647+26760+27773) =$ $(20268+25647+26965+32150) = (20268+25647+26965+32238) =$ $(20268+25647+26965+32239) = (20268+25647+26965+32311) =$ $(20268+25647+27773+32150) = (20268+25647+27773+32238) =$ $(20268+25647+27773+32239) = (20268+25647+27773+32311) =$ $(20268+25647+26965+35040) = (20268+25647+27773+35040) =$ $(24946+26965+ACA) = (24946+27773+ACA) =$ $(25951+26965+ACA) = (25951+27773+ACA) =$ $(26760+26965+ACA) = (26760+27773+ACA) =$ $(26965+32150+ACA) = (26965+32238+ACA) =$ $(26965+32239+ACA) = (26965+32311+ACA) =$ $(27773+32150+ACA) = (27773+32238+ACA) =$ $(27773+32239+ACA) = (27773+32311+ACA) =$ $(26965+35040+ACA) = (27773+35040+ACA) =$ $(20268+25647+26965+ACA) = (20268+25647+27773+ACA) =$ $(20268+24946+25647+26965+ACA) =$ $(20268+24946+25647+27773+ACA) =$ $(20268+25647+25951+26965+ACA) =$ $(20268+25647+25951+27773+ACA) =$ $(20268+25647+26760+26965+ACA) =$ $(20268+25647+26760+27773+ACA) =$ $(20268+25647+26965+32150+ACA) =$ $(20268+25647+26965+32238+ACA) =$ $(20268+25647+26965+32239+ACA) =$ $(20268+25647+27773+32150+ACA) =$ $(20268+25647+27773+32238+ACA) =$ $(20268+25647+27773+32239+ACA) =$ $(20268+25647+27773+32311+ACA) =$ $(20268+25647+26965+35040+ACA) =$ $(20268+25647+27773+35040+ACA) =$ $(20268+25647+27773+31106+32311+35040)$ </p>
R 0560	Mod: $(20268+26965) = (20268+31106) =$ $(20268+24946+25647+27773+31106) =$ $(20268+26965+27773+31106+32311+35040)$
R 0561	Mod : $24215+24588+26925+28160+31283+32090$
R 0562	Mod : $(20268+26965) = (20268+31106) =$ $(20268+24946+25647+27773+31106)$
R 0563	Mod : $(20268+26965) = (20268+31106) =$ $(20268+24946+25647+27773+31106) =$ $(20268+26965+27773+31106+32311+35040)$
R 0564	Mod: $(20268+21678+25404+26965) = (20268+21678+25404+31106) =$ $(20268+21678+24946+25404+25647+27773+31106) =$ $(20268+21678+25404+26965+27773+31106+32311+35040)$
R 0565	Mod : $(20268+24946+26965+36311/56-5-B6) =$ $(20268+24946+27773+36311/56-5-B6) =$ $(20268+24946+31106+36311/56-5-B6) =$ $(20268+26965+24946+36297/56-5-B5) =$ $(20268+27773+24946+36297/56-5-B5)$
R 0566	Mod : $(20268+24946+27773+31106) = (20268+27773+31106+32238) =$ $(20268+27773+31106+32311)$
R 0567	Mod : $(20268+24946+27773+31106+28342)$

CODE	DESIGNATION
R 0568	Mod : $(20268+25647+26965) = (20268+25647+27773) =$ $(20268+24946+25647+26965) = (20268+24946+25647+27773) =$ $(20268+25647+25951+26965) = (20268+25647+25951+27773) =$ $(20268+25647+26760+26965) = (20268+25647+26760+27773) =$ $(20268+25647+26965+32150) = (20268+25647+26965+32238) =$ $(20268+25647+26965+32239) = (20268+25647+26965+32311) =$ $(20268+25647+27773+32150) = (20268+25647+27773+32238) =$ $(20268+25647+27773+32239) = (20268+25647+27773+32311) =$ $(20268+25647+26965+35040) = (20268+25647+27773+35040) =$ $(20268+25647+26965+27773+31106+32311+35040) =$ $(24946+26965+ACA) = (24946+27773+ACA) =$ $(25951+26965+ACA) = (25951+27773+ACA) =$ $(26760+26965+ACA) = (26760+27773+ACA) =$ $(26965+32150+ACA) = (26965+32238+ACA) =$ $(26965+32239+ACA) = (26965+32311+ACA) =$ $(27773+32150+ACA) = (27773+32238+ACA) =$ $(27773+32239+ACA) = (27773+32311+ACA) =$ $(26965+35040+ACA) = (27773+35040+ACA) =$ $(20268+25647+26965+ACA) = (20268+25647+27773+ACA) =$ $(20268+24946+25647+26965+ACA) =$ $(20268+24946+25647+27773+ACA) =$ $(20268+25647+25951+26965+ACA) =$ $(20268+25647+25951+27773+ACA) =$ $(20268+25647+26760+26965+ACA) =$ $(20268+25647+26760+27773+ACA) =$ $(20268+25647+26965+32150+ACA) =$ $(20268+25647+26965+32238+ACA) =$ $(20268+25647+27773+32239+ACA) =$ $(20268+25647+27773+32311+ACA) =$ $(20268+25647+26965+35040+ACA) =$ $(20268+25647+27773+35040+ACA)$
R 0569	Mod : $(24588+24794+31283) = (24794+25534+31283) =$ $(24215+24588+24794+31283) =$ $(24215+24588+24794+25534+31283)$
R 0570	Mod : $(25205+20268/V2527/27E) = (23885+20268/V2527/27E) =$ $(26999+20268/V2527/27E) = (28382+20268/V2527/27E) =$ $(30241+20268/V2527/27E) = (26485+20268/V2527/27E) =$ $(30631+20268/V2527/27E) =$ $(26999+28382+28495+20268/V2527/27E) =$ $(25205+26999+28495+20268/V2527/27E) =$ $(20268+26999+28495+37999/V2527)$
R 0571	Mod : $25205 = 23885 = 26999 = 28382 = 30241 = 26485 = 30631 =$ $(26999+28382+28495) = (25205+26999+28495) =$ $(26999+28495+37999)$
R 0572	Mod : $25206 = 23885 = 26999 = 28382 = 30241 = 26485 = 30631 =$ $(26999+28382+28495) = (25205+26999+28495) =$ $(26999+28495+37999)$
R 0573	Mod : $(25205+26526) = (26111+26526) = (26485+26526) =$ $(26526+26999) = (26526+28382) = (26526+30241) =$ $(26526+30631) = (26526+30635) =$ $(26526+26999+28382+28495) = (25205+26526+26999+28495) =$ $(26526+26999+28495+37999)$
R 0574	Mod : $(22013+24215+24794+31283) = (24105+24215+24794+31283) =$ $(28160+24215+24794+31283) =$ $(22013+24215+24588+24794+31283) =$ $(24215+24588+24794+28160+31283) =$ $(24105+24215+24588+24794+31283)$

318/319/320/321 QUICK REFERENCE HANDBOOK
LIST OF EFFECTIVE TEMPORARY REVISIONS (LETR)

M --TR NO----	--DATE--	-----TITLE-----	-----EFFECTIVITY-----
398-1A	FEB2004	CDSS SMOKE FROM LCD MONITOR	ALL
521-1A	MAY2006	C/B RESET PROC FOR ACSC	ALL
604-1A	APR2008	CIDS RESET PROCEDURE	ALL
608-1A	JUL2008	AP MINI EQUIPMENT IN CAT 2/3	ALL
609-1A	JUL2008	LGCIU RESET PROCEDURE	ALL
614-1A	AUG2008	WINDSHEAR AHEAD	ALL
630-1A	NOV2008	STD OPERATING PROCEDURES-1	ALL
631-1A	NOV2008	STD OPERATING PROCEDURES-2	ALL

THIS TABLE GIVES, FOR EACH AIRCRAFT INCLUDED IN THE MANUAL, THE CROSS REFERENCE BETWEEN :

- THE MANUFACTURING SERIAL NUMBER (MSN) WHICH APPEARS IN THE LIST OF EFFECTIVE PAGES
- THE REGISTRATION NUMBER OF THE AIRCRAFT AS KNOWN BY AIRBUS INDUSTRIE.

MSN	REGISTRATION
0009	S16UPT2H0

M ---PAGE--- SEQ- --REV-- -----VALIDATION CRITERIA-----
M ---PAGE--- SEQ- --REV-- -----VALIDATION CRITERIA-----
-----EFFECTIVITY-----

0 .00 001 REV040
ALL
0 .00A 001 REV042
ALL
0 .00B 001 REV042
ALL
0 .01 001 REV042 LIST OF CODES
ALL
0 .01A 001 REV042 LIST OF CODES
ALL
0 .01B 001 REV042 LIST OF CODES
ALL
0 .01C 001 REV042 LIST OF CODES
ALL
0 .01D 001 REV042 LIST OF CODES
ALL
0 .01E 001 REV042 LIST OF CODES
ALL
0 .01F 001 REV042 LIST OF CODES
ALL
0 .01G 001 REV042 LIST OF CODES
ALL
0 .01H 001 REV042 LIST OF CODES
ALL
0 .01I 001 REV042 LIST OF CODES
ALL
0 .01J 001 REV042 LIST OF CODES
ALL
0 .01K 001 REV042 LIST OF CODES
ALL
0 .01L 001 REV042 LIST OF CODES
ALL
0 .01M 001 REV042 LIST OF CODES
ALL
0 .01N 001 REV042 LIST OF CODES
ALL
0 .01O 001 REV042 LIST OF CODES
ALL
0 .01P 001 REV042 LIST OF CODES
ALL
0 .01Q 001 REV042 LIST OF CODES
ALL
0 .01R 001 REV042 LIST OF CODES
ALL
0 .01S 001 REV042 LIST OF CODES
ALL
0 .01T 001 REV042 LIST OF CODES
ALL
0 .01U 001 REV042 LIST OF CODES
ALL
0 .01V 001 REV042 LIST OF CODES
ALL
0 .01W 001 REV042 LIST OF CODES
ALL
0 .01X 001 REV042 LIST OF CODES
ALL
0 .01Y 001 REV042 LIST OF CODES
ALL
0 .01Z 001 REV042 LIST OF CODES
ALL
0 .02 001 REV042 LIST OF CODES
ALL

M ---PAGE--- SEQ- --REV-- ----VALIDATION CRITERIA-----
M ---PAGE--- SEQ- --REV-- ----VALIDATION CRITERIA-----
-----EFFECTIVITY-----

0 .02A 001 REV042 LIST OF CODES
ALL

0 .02B 001 REV042 LIST OF CODES
ALL

0 .02C 001 REV042 LIST OF CODES
ALL

0 .02D 001 REV042 LIST OF CODES
ALL

0 .03- 001 REV042 LIST OF TEMPORARY REVISIONS
ALL

0 .04- 001 REV042 CROSS REFERENCE TABLE
ALL

0 .06- 001 REV042 LIST OF EFFECTIVE PAGES
ALL

0 .07- 001 REV042 LIST OF MOD/MP/SB
ALL

1 .00 105 REV042 CODE 0512
ALL

1 .01 410 REV032 M:21678+21706+21768+21858
1 .02 100 REV032 M:21678
ALL

1 .03 405 REV040 CODE 0522
1 .04 325 REV032 M:21285+21678+25404/CFM
ALL

1 .05 610 REV042 CODE 0264/B4
1 .06 001 REV041 STD
ALL

1 .07 100 REV039 27498=31891
1 .08 207 REV042 CODE 0008
ALL

1 .09 001 REV042 STD
1 .10 310 REV042 CODE:0134/56-5-B4
ALL

1 .11 400 REV042 CODE 0176/56-5-B4
1 .12 310 REV042 CODE:0125/56-5-B4
ALL

1 .13 001 REV036
1 .14 150 REV042 CODE 0389
ALL

1 .14A 100 REV040 34637
ALL

1 .15 105 REV040 CODE 0028
1 .16 119 REV041 CODE 0061
ALL

1 .17 110 REV040 CODE 0273
1 .18 137 REV042 CODE 0046
ALL

1 .18A 001 REV042
ALL

1 .19 134 REV040 CODE 0223
1 .20 238 REV041 CODE 0069
ALL

1 .21 137 REV042 CODE 0046
1 .22 136 REV042 CODE 0046
ALL

1 .23 203 REV039 CODE 0385
1 .24 210 REV042 CODE 0413
ALL

1 .24A 001 REV042
ALL

1 .25 001 REV042
1 .26 100 REV042 22249
ALL

1 .27 100 REV042 CODE 0513
ALL

2 .00 606B REV042 CODE 0561
ALL

M ---PAGE--- SEQ- --REV-- ----VALIDATION CRITERIA-----
M ---PAGE--- SEQ- --REV-- ----VALIDATION CRITERIA-----
-----EFFECTIVITY-----

2 .00A 001 REV042 ALL
2 .01 001 REV032
2 .02 102 REV041 25888=37987 ALL
2 .02A 102 REV041 25888=37987 ALL
2 .02B 001 REV038 CODE 0516 ALL
2 .03 310 REV042 CODE 0003
2 .04 002 REV038 STD ALL
2 .05 001 REV042 STD=M:24105
2 .06 001 REV042 ALL
2 .07 001 REV042
2 .08 110 REV039 CODE 0324 ALL
2 .08A 200 REV042 CODE 0493 ALL
2 .09 100 REV039 20024
2 .10 200 REV042 CODE 0495 ALL
2 .10A 001 REV039 ALL
2 .10B 001 REV037 ALL
2 .11 301 REV039 CODE 0496
2 .12 001 REV042 ALL
2 .13 001 REV042
2 .14 001 REV042 ALL
2 .15 223 REV042 CODE 0232
2 .16 119 REV042 CODE 0571 ALL
2 .17 119 REV041 CODE 0572
2 .18 123 REV040 CODE 0244 ALL
2 .18A 123 REV040 CODE 0244 ALL
2 .19 308 REV042 CODE 0426
2 .20 200 REV042 CODE 0373 ALL
2 .20A 105 REV042 35220 ALL
2 .21 200 REV042 CODE 0481
2 .22 060 REV042 B1/B2/B3/B4/B5/B6/B7/B8/B9 ALL
2 .23 025 REV041 CFM
2 .24 025 REV035 CFM ALL
2 .25 330 REV038 CODE:0362/56-5-B4
2 .26 001 REV042 STD ALL
2 .26A 001 REV042 STD=24105 ALL
2 .27 001 REV035
2 .28 105 REV042 31276=20343=31276+27498 ALL
2 .29 001 REV040 STD
2 .30 001 REV040 STD ALL
2 .30A 001 REV040 STD ALL
2 .31 170 REV042 20268/56-5-A1/A3/B4
2 .32 001 REV042 STD ALL

M ---PAGE--- SEQ- ---REV--- -----VALIDATION CRITERIA-----
M ---PAGE--- SEQ- ---REV--- -----VALIDATION CRITERIA-----
-----EFFECTIVITY-----

2 . 32A 101 REV042 26925
ALL

2 . 33 001 REV042 STD
2 . 34 001 REV040
ALL

2 . 35 001 REV035
2 . 36 001 REV040 STD = 26792+28488
ALL

2 . 37 105 REV040 33100+33300
2 . 38 201 REV042 CODE 0343
ALL

2 . 38A 101 REV042 32650+22013+38634
ALL

2 . 39 502 REV042 CODE 0418
2 . 40 205 REV042 CODE 0436
ALL

2 . 41 025 REV036 CFM
2 . 42 001 REV039 STD
ALL

2 . 43 126 REV041 20268/56-5-B4
ALL

3 . 00 001 REV042
ALL

3 . 01 001 REV042 CODE 0506
3 . 02 120 REV042 27620+27620+37285
ALL

3 . 03 103 REV042 26358
3 . 04 100 REV042 26925
ALL

3 . 05 001 REV042
3 . 06 103 REV042 26358
ALL

3 . 07 001 REV042
3 . 08 001 REV042
ALL

3 . 09 001 REV042
3 . 10 100 REV042 25863
ALL

3 . 11 101 REV042 M:20081
ALL

4 . 00 001 REV042
ALL

4 . 00A 210 REV042 20268+25225/CFM A1/A3/B4
ALL

4 . 01 170 REV025 M:20268 CFM 56-5-A1/A3/B4
4 . 02 310 REV037 CODE:0171/56-5-B4
ALL

4 . 03 310 REV037 CODE:0171/56-5-B4
4 . 04 310 REV039 CODE:0171/56-5-B4
ALL

4 . 05 170 REV041 M:20268/56-5-B4
4 . 06 170 REV032 CODE:0024/CFM 56-5-B4
ALL

4 . 07 170 REV032 CODE:0024/CFM 56-5-B4
4 . 08 170 REV027 CODE:0024 CFM 56-5-B4
ALL

4 . 09 170 REV037 CODE:0024/CFM 56-5-B4/T=L
4 . 10 170 REV027 CODE:0024 CFM 56-5-B4
ALL

4 . 11 012 REV038 CODE 0258 56-5-B4
4 . 12 170 REV027 CODE:0024 CFM 56-5-B4
ALL

4 . 13 170 REV030 CODE 0024/CFM 56-5-B4
4 . 14 170 REV033 CODE:0024 CFM 56-5-B4
ALL

4 . 15 001 REV024
4 . 16 001 REV024
ALL

M ---PAGE--- SEQ- --REV-- ----VALIDATION CRITERIA-----

M ---PAGE--- SEQ- --REV-- ----VALIDATION CRITERIA-----

-----EFFECTIVITY-----

5 .00 001 REV035
ALL

5 .01 170 REV039 CODE 0244
5 .02 110 REV037 26925
ALL

5 .03 100 REV024 M:22013=24105=26334=26335
5 .04 001 REV038
ALL

6 .00-LEB 001 REV042 LEOEB-PROC
ALL

7 .00 001 REV040 STD
ALL

7 .01 105 REV042 CODE 0325
ALL

M

V REV MOD MP TITLE
T SB VALIDITY

. 040 20024 FUEL- INSTALL A CENTRE TANK SYSTEM-
..... ALL

. 036 20059 AIR CONDITIONING - CARGO COMPARTMENT -
VENTILATION - INSTALL SYSTEM IN AFT
COMPARTMENT -
..... ALL

. 037 20063 OXYGEN - FLIGHT CREW SYSTEM - INSTALL
A 77.1 CU/FT BOTTLE IN COMPOSITE
MATERIAL -
..... ALL

. 042 20081 LIGHTS - EXTERIOR LIGHTS - INSTALL
SYNCHRONIZED STROBE LIGHTS
..... ALL

. 038 20268 WINGS-WING TIP FENCES-INTRODUCE WING
TIPS INCLUDING FENCES-
..... ALL

. 038 21285 ENGINE CONTROLS-MODIFY POWER SUPPLY
FOR HP FUEL SOLENOID
..... ALL

. 038 21678 ELECTRICAL POWER-AC/DC ESSENTIAL POWER
DISTRIBUTION-PROVIDE PROVISIONS FOR
ETOPS-
..... ALL

. 038 21706 AIR CONDITIONING - VENTILATION CONT.
ISOLATION VALVES - CHANGE POWER SUPPLY
FOR ETOPS -
..... ALL

. 038 21768 AIR CONDITIONING - PROVIDE EMERGENCY
POWER SUPPLY FOR AFT CARGO COMPT
HEATING CONTROLLER FOR EROPS -
..... ALL

. 038 21858 COMMUNICATIONS - INSTALL HF1 FOR EROPS
..... ALL

. 042 22249 AUTO FLIGHT - ACTIVATE WINDSHEAR
FUNCTION
..... ALL

M

V REV MOD MP TITLE
T SB VALIDITY

. 038 22536 NAVIGATION - INSTALL A BENDIX TCAS II
 COLLISION AVOIDANCE SYSTEM
 ALL

. 042 23510 NAVIGATION - ADIRS - ADAPT SHELVES
 FOR 4 MCU ADIRS INSTALLATION
 ALL

. 038 24215 AUTO FLIGHT - FAC - INSTALL TWO FACS
 P/N BAM 0509
 ALL

. 035 24251 POWER PLANT - A320 - CFM 56 -
 INSTALL DERATED ENGINES CFM 56-B4
 ALL

. 038 24588 AUTO FLIGHT-FAC-INTRODUCE FAC
 P/N BAM 510
 ALL

. 038 24645 LANDING GEAR-MLG-LGCIU-INTRODUCTION
 OF STANDARD UNIT P/N A4C
 ALL

. 038 24946 LANDING GEAR - MLG - MESSIER -
 INTRODUCE BRAKES P/N C202253
 ALL

. 038 25205 NAVIGATION-PRIMARY MEANS USING
 HONEYWELL GPS (HYBRID ARCHITETURE)
 PROVIDING RAIM FUNCTION (CL)
 ALL

. 038 25225 AUTO FLIGHT-FMGC-REDUCE VAPP
 FOR A320 CFM/IAE
 ALL

. 041 25240 AUTO FLIGHT - FMGC - PROVIDE ACARS
 AND PRINTER INTERFACES IN FMS
 (CFM VERSION)
 ALL

. 038 25404 EXHAUST-THRUST REVERSER CONTROL AND
 INDICATING-ACTIVATE ADDITIONAL THRUST
 REVERSER LOCK CONTROL
 ALL

M

V REV MOD MP TITLE
T SB VALIDITY

. 038 25419 ICE AND RAIN PROTECTION-WINDSHIELD
 RAIN PROTECTION-DESACTIVATION OF RAIN
 REPELLENT SYSTEM
 ALL

. 041 25590 INDICATING/RECORDING SYSTEMS - FWC -
 DEFINE OEB REMINDER WITHIN FWC STD -E1
 AND SUBSEQUENT
 ALL

. 038 25800 POWER PLANT-GENERAL-INTRODUCE
 CFM56-5B/P
 ALL

. 035 25863 AUTO FLIGHT - FCU - DEFINE FLIGHT
 DIRECTOR ENGAGEMENT IN CROSSED BARS
 AT GO AROUND
 ALL

. 041 25888 A.P.U.-POWER PLANT-INTRODUCE
 ALLIED SIGNAL APU 131-9(A)
 ALL

. 039 26270 NAVIGATION - SINGLE PWS -
 COLLINS SINGLE PWS ACTIVATION
 ALL

. 038 26335 FLIGHT CONTROLS-GENERAL-
 DELETION OF L.A.F. FEATURE FROM
 A320 A/C (SERIAL SOLUTION)
 ALL

. 038 26358 AUTOFLIGHT-FLIGHT CONTROL UNIT-
 (FCU) INTRODUCE SEXTANT MODULAR
 FCU
 ALL

. 041 26443 NAVIGATION - VOR/MARKER - INSTALL TWO
 VOR/MARKER RECEIVERS 900 COLLINS
 P/N 822-0297-020
 ALL

. 038 26526 NAVIGATION - GPWS - ACTIVATE
 ENHANCED FUNCTIONS OF THE EGPWS
 ALL

M

V REV MOD MP TITLE
T SB VALIDITY

. 041 26726 INDICATING/RECORDING SYSTEM-SDAC-
 INTRODUCE SDAC (NEW TECHNOLOGY)
 ALL

. 041 26728 INDICATING/RECORDING SYSTEM - FWC -
 INTRODUCE FWC STANDARD H2E2
 ALL

. 038 26792 AIR CONDITIONING-PACK TEMPERATURE CTRL-
 INTRODUCE MODIFIED PACK TEMPERATURE
 CONTROLLER
 ALL

. 038 26910 FLIGHT CONTROL -ELAC SYSTEM-
 INTRODUCE E.L.A.C. WITH ENHANCED RELAYS
 ALL

. 042 26925 LANDING GEAR-ALTERNATE BRAKING-
 INTRODUCE MODIFIED ALTERNATE
 BRAKING SYSTEM
 ALL

. 042 26963 ICE AND RAIN PROTECTION-WINSHIELD RAIN
 PROTECTION-ACTIVATION OF RAIN REPELLENT
 SYS.(FLUID COMPATIBLE WITH OZONE RULES)
 ALL

. 039 26965 LANDING GEAR-WHEELS AND BRAKES-
 INTRODUCE BSCU COMMON STD
 ALL

. 041 26968 AUTO FLIGHT-FMGC-INTRODUCE FMGC CAM0102
 FOR A319 AUTOLAND AND GPS/ACARS FOR
 CFM ENGINES
 ALL

. 038 26999 NAVIGATION - MMR - INSTALL COLLINS MMR
 PROVIDING ILS AND GPS FUNCTION
 ALL

. 042 27140 ELECTRICAL POWER-GENERAL-DEFINE NEW
 ELECTRICAL GENERATION CONCEPT FOR
 SINGLE AISLE A/C
 ALL

M

V REV MOD MP TITLE
T SB VALIDITY

. 038 27276 FLIGHT CONTROLS-ELAC SYSTEM-INTRODUCE
 ELAC SOFTWARE "L80"
 ALL

. 038 27498 ELECTRICAL POWER - GENERAL - AC-DC
 MAIN DISTRIBUTION - INSTALL AC-DC
 SHEDDABLE BUSBARS
 ALL

. 038 27522 INFORMATION SYSTEM - AIR TRAFFIC AND
 INFORMATION SYSTEM (ATIMS) - INSTALL
 ATSU COMPUTER FOR ACARS
 ALL

. 041 27572 OXYGEN-PASSENGER OXYGEN-INTRODUCE
 MODIFIED CHEMICAL OXYGEN CONTAINER
 -15 MIN- PURITAN
 ALL

. 038 27620 NAVIGATION-STANDBY DATA : ALTITUDE AND
 HEADING - INSTALL INTEGRATED STANDBY
 INSTRUMENT SYSTEM (ISIS)
 ALL

. 038 27698 NAVIGATION - TCAS - INSTALL ALLIED
 SIGNAL TCAS COMPUTER P/N 066-50000-2220
 (WITH CHANGE 7.0)
 ALL

. 038 27773 LANDING GEAR-NORMAL BRAKING-
 INTRODUCE STD 8 BSCU (TWIN
 VERSION)
 ALL

. 037 28160 ELEC PWR-AC EMERGENCY GENERATION-
 ACTIVATE A319/A321 ELECTRICAL
 EMERGENCY CONFIGURATION ON A320 A/C
 ALL

. 042 28244 NAVIGATION-GPWS-INTRODUCE EGPWS
 P/N 206-206 AND INHIBIT AUTOMATIC
 DEACTIVATION ENHANCED FUNCTIONS
 ALL

M

V REV MOD MP TITLE
T SB VALIDITY

- . 038 28382 NAVIGATION - MMR - ACTIVATE GPS PRIMARY
..... FUNCTION (HYBRID) IN SEXTANT MMR
(WITH HONEYWELL OR LITTON ADIRU)
ALL
- . 038 28479 INDICATING RECORDING SYSTEM-FWC-
..... INTRODUCE FWC STANDARD H2/E3P
ALL
- . 038 28488 AIR CONDITIONING-PACK TEMP.CTRL
..... INTRODUCE MODIFIED PACK TEMP.
CTRL P/N 759D0000-02
ALL
- . 041 30365 INDICATING RECORDING SYSTEM-SDAC-
..... INTRODUCE STANDARD SDAC P/N
350E5500202
ALL
- . 038 30368 INDICATING RECORDING SYSTEMS-
..... EIS-INSTALL DMC, DU AND DISKETTES
FOR EIS2
ALL
- . 041 30439 AUTO-FLIGHT-FLIGHT AUGMENTATION
..... COMPUTER-INTRODUCE FAC SOFTWARE
STANDARD P/N B397BAM0515
ALL
- . 042 30626 AIR CONDITIONING-AIR COOLING-
..... INSTALL A NEW ECS
ALL
- . 041 30660 INDICATING/RECORDING SYSTEMS - FWC -
..... INSTALL FWC STANDARD H2E4
ALL
- . 042 31105 NAVIGATION - ADIRS - INSTALL HONEYWELL
..... ADIRU 4MCU P/N HG2030AE21
(A318 COEFF CFM ADDED)
ALL
- . 038 31106 LANDING GEAR - NORMAL BRAKING -
..... INTRODUCE STD 9 BSCU (TWIN VERSION)
ALL

M

V REV MOD MP TITLE
T SB VALIDITY

. 041 31152 LANDING GEAR-STEERING-SUPPLY NOSE
 WHEEL STEERING WITH YELLOW HYDRAULIC
 POWER IN PLACE OF GREEN HYDRAULIC POWER
 ALL

. 038 31276 ELECTRICAL POWER - GENERAL -
 INSTALL A COMMERCIAL SHEDDING
 PUSH-BUTTON SWITCH IN COCKPIT
 ALL

. 041 31283 INDICATING RECORDING SYSTEM-FWC-
 INTRODUCE FWC STANDARD H2 F1
 ALL

. 041 31365 AUTO-FLIGHT-FMGC-INSTALL FMGC
 P/N B546CAM0103 (CFM GPS/ACARS)
 ALL

. 042 31375 NAVIGATION - EGPWS - ACTIVATE OBSTACLE
 OPTION ON THE EGPWS
 ALL

. 038 31395 FLIGHT CONTROLS - ELAC SYSTEM -
 INTRODUCE ELAC STD L81
 ALL

. 038 31495 INDICATING/RECORDING SYSTEM-EIS2-
 INSTALL MODIFIED EIS2 SOFTWARE
 ALL

N 042 31579 AUTOFLIGHT-FMGC-INSTALL FMGC
 P/N B546CAM0104 (CFM GPS+ACARS)
 ALL

. 042 31896 AUTOFLIGHT-FMGC-INSTALL FMGC CFM
 C13042AA01 (EQUIPPED WITH FMS2)
 HONEYWELL
 ALL

. 041 32042 AUTO FLIGHT - FMGC - ACTIVATE MORA
 DISPLAY ON ND
 ALL

M

V REV MOD MP TITLE
T SB VALIDITY

. 038 32087 COMMUNICATIONS-ANTI HIJACK CAMERA
 MONITORING-INSTALL A COCKPIT DOOR
 SURVEILLANCE SYSTEM
 ALL

. 038 32088 EQUIPMENT FURNISHINGS-CURTAINS AND
 PARTITIONS-MODIFIED INTRUSION AND
 PENETRATION RESISTANT COCKPIT DOOR
 ALL

. 038 32090 DOORS-PASSENGER COMPARTMENT FIXED
 INTERIOR DOORS-INSTALL ELECTRICAL
 COCKPIT DOOR RELEASE SYSTEM
 ALL

. 041 32650 FUEL - QUANTITY INDICATION -
 INTRODUCE FUEL LEAK DETECTION
 ALL

. 042 33100 COMMUNICATIONS-CIDS-INTRODUCE ENHANCED
 CIDS (A318 VERSION) AND RELATED SYSTEMS
 ON SINGLE AISLE FAMILY
 ALL

. 042 33376 LANDING GEAR - NORMAL BRAKING -
 INSTALL BSCU STD L4.5
 ALL

. 042 34043 FLIGHT CONTROLS - ELAC SYSTEM -
 INSTALL ELAC L91 SOFTWARE
 ALL

. 042 34428 AIR CONDITIONING - PACK TEMPERATURE
 CONTROL - INSTALL IMPROVED AIR COND.
 SYSTEM CONTROLLER PN 1803B0000-01
 ALL

. 039 34571 INDICATING/RECORDING SYSTEMS-ELECTRONIC
 INSTRUMENT SYSTEM(EIS)- INSTALL DISPLAY
 MANAGEMENT COMPUTER SOFTWARE EIS2 S4-2
 ALL

. 042 34573 AUTO FLIGHT - FLIGHT MANAGEMENT AND
 GUIDANCE COMPUTER (FMGC)-INSTALL FMS2
 HONEYWELL P1C11 ON A/C WITH CFMI PPS
 ALL

M

V REV MOD MP TITLE
T VALIDITY

. 042 34637 NAVIGATION- T2CAS- INSTALL ACSS TRAFFIC
..... AND TERRAIN COLLISION AVOIDANCE SYSTEM
(T2CAS)
ALL

. 042 34825 NAVIGATION- GPWS - USE LATERAL GPS
..... POSITION WITH AUTOMATIC DESELECTION
ALL

. 042 35216 LANDING GEAR - NORMAL BRAKING -
..... INSTALL BSCU STD L4.8 (EM2)
ALL

. 041 35220 INDICATING/RECORDING SYSTEMS -
..... FLIGHT WARNING COMPUTER (FWC) -
INSTALL FWC STANDARD H2F3
ALL

. 042 35863 AIR CONDITIONING - PACK TEMPERATURE
..... CONTROL - INSTALL AIR CONDITIONING
CONTROLLER P/N 1803B0000-02
ALL

. 042 36627 NAVIGATION - TRAFFIC AND TERRAIN
..... COLLISION AVOIDANCE SYSTEM - INSTALL
T2CAS STD 2 (-11111)
ALL

. 041 36847 INDICATING RECORDING SYSTEM -
..... FLIGHT WARNING COMPUTER (FWC)-
INSTALL FWC STANDARD H2-F4
ALL

. 042 37356 NAVIGATION - MMR -
..... INSTALL COLLINS MMR STANDARD P/N
822-1152-122
ALL

CONTENTS

■ ELEC

- . ELEC EMER CONFIG-SYS REMAINING 1.01
- . ELEC EMER CONFIG Summary 1.05

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- . SMOKE/FUMES REMOVAL 1.06
- . SMOKE/FUMES/AVNCS SMOKE 1.07

■ HYDRAULIC

- . HYD B+Y SYS LO PR Summary 1.10
- . HYD G+B SYS LO PR Summary 1.11
- . HYD G+Y SYS LO PR Summary 1.12

■ LANDING GEAR

- . LOSS OF BRAKING 1.13

■ NAVIGATION

- . GPWS ALERTS/EGPWS ALERTS ◁ 1.14
- . TCAS WARNINGS ◁ 1.15

■ POWER PLANT

- . ENG DUAL FAILURE – FUEL REMAINING 1.16
- . ENG DUAL FAILURE – NO FUEL REMAINING 1.20

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- . DITCHING 1.23
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- . WINDSHEAR 1.26
- . WINDSHEAR AHEAD 1.27
- . EMERGENCY EVACUATION 7.00



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 (1)
	RAM AIR	Norm	Norm	Norm
	PACK VALVE 1	Norm	Closure inop	Closure inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop (1)
	AVIONIC VENT	Norm	Norm	Partial
	AFT CRG VENT VALVES	Norm	Inop	Inop
	AFT CRG HEAT	Norm	Inop	Inop
APU	ECB – STARTER	Norm (3)	Inop	Inop (1)
	FUEL LP VALVE	Norm	Norm	Norm
	FUEL PUMP	Norm	Norm	Norm
COM	VHF 1	Norm	Norm	Norm
	HF 1	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
EIS	PFD 1	Norm	Norm	Norm (2)
	ND 1	Norm	Inop	Inop
	ECAM upper disp.	Norm	Norm	Norm (2)
	DMC 1 or 3	Norm	Norm	Norm (2)
	SDAC 1, FWC 1	Norm	Norm	Norm (2)
	ECAM cont. panel	Norm	Norm	Norm

(1) Restored, when speed is below 100 knots.

(2) Lost, when speed is below 50 knots.

(3) For APU start only.



CONT'D



ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
EMER EQPT	CREW OXY	Norm	Norm (4)	Norm (4)
	PAX OXY mask release (auto + man)	Norm	Inop	Inop
	SLIDES ARM/WARN	Norm	Norm	Norm
FLT INS	CLOCKS	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 (1)
	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 (1)
	APU AUTO EXT.	Inop	Inop	Inop (1)
FLT CTL	ELAC	N° 1 only	N° 1 + N° 2	N° 1 + N° 2 (3)
	SEC	N° 1 only	N° 1	N° 1 (3)
	FCDC	N° 1 only	Inop	Inop
	SFCC	N° 1 only	N° 1 only	N° 1 only
	Flaps pos ind	Norm	Norm	Norm (2)
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
FUEL	LP VALVE	Norm	Norm	Norm
	FQI channel 1	Norm	Inop	Inop
	X FEED VALVE	Norm	Inop	Inop
	TRANSFER VALVE	Norm	Inop	Inop

(1) Restored, when speed is below 100 knots.

(2) Lost, when speed is below 50 knots.

(3) Lost 30 seconds after last engine shutdown.

(4) Crew oxygen valve control inoperative.



CONT'D



ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
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 (1)
	CAPT AOA	Norm	Inop	Inop
	RAIN REPELLENT (Capt)	Norm	Norm	Norm
	LGCIU SYS 1	Norm	Norm	Norm
L/G	ABCU	Norm	Norm	Norm
	BRK PRESS IND	Norm	Norm	Norm
	PARK BRK	Norm	Norm	Norm
	EMER CKPT	Norm	Norm	Norm
LIGHTS	EMER CAB	Norm	Norm	Norm
	IR	N° 1 only (2)	N° 1 only (2)	N° 1 only (2)
NAV	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 (1)
	DME	N° 1 only	Inop	Inop
	VOR/DDRMI	Norm	Norm	Norm (1)
	ATC	N° 1 only	Inop	Inop
	ISIS	Norm	Norm	Norm

- (1) Lost, when speed is below 50 knots.
 (2) IR2 and IR3 are lost 5 minutes after failure of the main generators.
 But, if IR3 replaces IR1 (ATT-HDG selector at CAPT3), IR3 remains supplied.



CONT'D

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING	BAT ONLY	
			IN FLIGHT	ON THE GROUND
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 (1)
	X BLEED (man ctl)	Norm	Inop	Inop
PWR	FADEC	A + B (2)	A + B (2)	A + B (2)
	IGNITION	A only	A only	A only
PLT	HP FUEL VALVE closure	Norm	Norm	Norm
MISC	MECH HORN	Norm	Norm	Norm

(1) Restored, when speed is below 100 knots.

(2) Channels A and B are self-powered above 12 % N2. If N2 is below 12 %, only Channel A is powered.



ELEC EMER CONFIG Summary

C R U S E	MAX SPD	320 KT
	ALTN LAW : PROT LOST	
	ONLY CAPT PITOT AND AOA HEATED	
	FUEL : CTR TK UNUSABLE.	
COM : VHF1, ATC1, RMP1 only		
NAV : ILS1, VOR1, GPS1 (if MMR is installed) only		
LANDING CONF		APPROACH SPEED
Use FLAP 3		VAPP = VREF + 10 KT/140 KT

W(1000Kg)	40	44	48	52	56	60	64	68	72	76	78
VREF=VLS CONF FULL	106	111	116	121	125	130	134	138	142	146	148

R A P P R	CAT 2 INOP									
	MINIMUM RAT SPEED 140 KT									
	SLATS FLAPS SLOW									
	• When L/G down : USE MAN PITCH TRIM.									

L A N D I N G	FLARE : Only 2 spoilers per wing. Direct law	
	SPOILERS : Only 2 per wing	NO REVERSER
	BRAKING : ALTERNATE without antiskid	
	MAX BRK PR 1000 PSI	
NO NOSEWHEEL STEERING		

G A	NIL								

ACTUAL LANDING DISTANCES (m) WITH FAILURE									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1860	1940	2050	2120	2230	2420	2630	2870	3110
WET runway	1950	2080	2210	2350	2500	2630	2800	2950	3090
CONTA runway	Refer to 4.03 and apply LDG DIST COEF = 2.15								

CORRECTIONS	+ 1000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 3 %	+ 21 %

The method for approach speed computation is given in the QRH 2.31.

**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** **10000 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 **FL100 or MEA** :
 - If electrical emergency configuration :
 - **APU MASTER SW** **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**
 - 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 PERCEPTEBLE 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 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)

● 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



In case of perceptible smoke, remember that the smoke may be coming from the Cockpit Door Surveillance System LCD monitor :

■ IF SMOKE FROM LCD MONITOR IS SUSPECTED :

- CKPIT DOOR VIDEO pushbutton OFF

**SMOKE/FUMES/AVNCS SMOKE (CONT'D)**

- **IF SMOKE SOURCE CANNOT BE DETERMINED AND STILL CONTINUES OR AVNCS/ELECTRICAL SMOKE SUSPECTED :**

R 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 1 LINE ON

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									
R		3	VAPP = VREF + 6 KT								
		FULL	VAPP = VREF								

R	W(1000KG)	40	44	48	52	56	60	64	68	72	76	78
R	VREF=VLS CONF FULL	106	111	116	121	125	130	134	138	142	146	148

R	SLATS SLOW / FLAPS SLOW	CAT 2 INOP
R	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	

G/A	NO GEAR RETRACTION. Increased fuel consumption
-----	--

ACTUAL LANDING DISTANCES (m) WITH FAILURE									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
DRY runway (Conf full)	1190	1250	1310	1360	1430	1550	1690	1840	1990
DRY runway (Conf 3)	1330	1390	1470	1520	1600	1730	1890	2060	2230
WET runway (Conf full)	1610	1720	1820	1950	2070	2170	2310	2430	2560
WET runway (Conf 3)	1780	1900	2010	2150	2280	2400	2560	2690	2830
CONTA runway (Conf full)	Refer to 4.03 and apply LDG DIST COEF = 1.85								
CONTA runway (Conf 3)	Refer to 4.03 and apply LDG DIST COEF = 2.05								

CORRECTIONS	+ 1000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 3 %	+ 21 %

The method for approach speed computation is given in the QRH 2.31.

HYD G + B SYS LO PR Summary

C R U I S E	SPD BRK	DO NOT USE
	MAX SPD	320/.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	130	134	138	142	146	148

R	SLATS JAMMED / FLAPS SLOW	CAT 2 INOP
	ATHR	OFF
A	GPWS LDG FLAP 3	ON
P	<ul style="list-style-type: none"> ● WHEN SPD 200 KT <ul style="list-style-type: none"> - L/G ● WHEN L/G down : USE MAN PITCH TRIM 	
P	For Flaps extension : SPD SEL	
R	When in landing CONF : DECELERATE TO CALCULATED VAPP	

L A N D I N G	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	

G O A R O U N D	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									
WEIGHT (1000 KG)	46	50	54	58	62	66	70	74	78
DRY runway	1260	1320	1390	1440	1520	1640	1790	1950	2110
WET runway	1700	1810	1920	2050	2180	2290	2430	2560	2690
CONTA runway	Refer to 4.03 and apply LDG DIST COEF = 1.95								

R	CORRECTIONS	+ 1000 ft above SL	+ 10 kt tailwind
	DRY runway	+ 3 %	+ 18 %
	WET runway	+ 3 %	+ 21 %

The method for approach speed computation is given in the QRH 2.31.

HYD G + Y SYS LO PR Summary

C R U I S E	MAX SPD	320/.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	130	134	138	142	146	148

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

L A N D I N G	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 1000 PSI
	NO NOSEWHEEL STEERING

GO
A
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O
U
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D

- **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

CORRECTIONS	+ 1000 ft above SL	+ 10 kt tailwind
DRY runway	+ 3 %	+ 18 %
WET runway	+ 3 %	+ 21 %

The method for approach speed computation is given in the QRH 2.31.



LOSS OF BRAKING

● IF AUTOBRAKE IS SELECTED :

– BRAKE PEDALS PRESS

● 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

**GPWS 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.

■ "AVOID TERRAIN"

Simultaneously :

- AP OFF
 - PITCH PULL UP
- Pull to full backstick and maintain in that position.*
- THRUST LEVERS TOGA
 - SPEEDBRAKES 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.

■ "PULL UP" – "TERRAIN TERRAIN PULL UP" – "TERRAIN AHEAD PULL UP"

Simultaneously :

- AP OFF
 - PITCH PULL UP
- Pull to full backstick and maintain in that position.*
- THRUST LEVERS TOGA
 - SPEEDBRAKE lever CHECK RETRACTED
 - BANK WINGS LEVEL or ADJUST

● When the 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.





GPWS ALERTS (Cont'd)

■ **"TERRAIN TERRAIN" "TOO LOW TERRAIN"** :

Adjust the flight path, or initiate a go-around.

■ **"TERRAIN AHEAD"** :

Adjust the flight path. Stop descent. Climb and/or turn, as necessary, based on an 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"** :

R Perform a go-around.

■ **"GLIDE SLOPE"** :

Establish the aircraft on the glide slope, or switch OFF the G/S mode pushbutton, if flight below the glide slope is intentional (non precision approach (NPA)).

TCAS WARNINGS**■ Traffic advisory : "TRAFFIC" messages**

- Do not maneuver based on a TA alone.
- Attempt to see the reported traffic.

R

R

R

R

R

R

R

R

R

R

■ 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 vertical speed, 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 $V_{x\max}$ and V_{\max} .

- Respect stall, GPWS, or windshear warning.
- Notify ATC.
- When "CLEAR OF CONFLICT" is announced :
 - . Resume normal navigation in accordance with ATC clearance.
 - . AP/FD can be re-engaged as desired.
- **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 feet.

**ENG DUAL FAILURE – FUEL REMAINING**

As long as none of the engines recover, the flight crew must apply this paper procedure when required by the ECAM ENG DUAL FAILURE procedure. If time permits, clear ECAM alerts, and check the ECAM STATUS page.

LAND ASAP

- OPTIMUM RELIGHT SPD 300 KT
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	– 4.5
60 000 kg/132 000 lb	– 3.5
70 000 kg/154 000 lb	– 2.5

At 300 knots, the aircraft can fly up to about 2 NM per 1000 feet (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 (1000 kg)	At or below FL 200	FL 300	FL 400
78	241	251	261
76	237	247	257
72	229	239	249
68	221	231	241
64	213	223	233
60	205	215	225
56	197	207	217
52	189	199	209
48	181	191	201
44	173	183	193
40	165	175	185

At green dot speed, the aircraft can fly up to approximately 2.5 NM per 1000 feet (with no wind).

Average rate of descent is approximately 1600 feet/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 800 feet/NM (with no wind).

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





ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

■ 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 knots / 150 knots :

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	155	159	163	167	171	173

- At a suitable altitude (not below 3000 feet AGL), configure the aircraft for landing (CONF 3 ; L/G DOWN) :

● When in CONF 3 and VAPP :

- GRAVITY GEAR EXTN handcrank PULL AND TURN
Disregard "USE MAN PITCH TRIM" on the PFD : The stabilizer is frozen due to insufficient 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 knots (max speed with slats extended).
- GND SPLR ARM
- MAX BRK PR 1000 PSI

AT 2000 FEET AGL

- CABIN NOTIFY FOR LANDING

AT 500 FEET AGL

- BRACE FOR IMPACT ORDER

AT TOUCHDOWN

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





ENG DUAL FAILURE - FUEL REMAINING (Cont'd)

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 150 KT
- VAPP DETERMINE
VAPP is the maximum between Vref + 25 knots / 150 knots :

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	155	159	163	167	171	173

● At a suitable altitude (not below 3000 feet AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)

- L/G lever CHECK UP

AT 2000 FEET AGL

- CABIN NOTIFY FOR DITCHING
- DITCHING pushbutton ON
In case of strong crosswind, ditch face to the wind.
In the absence of strong crosswind, prefer ditching parallel to the swell. Touchdown with approximately 11 degrees of pitch and minimum aircraft vertical speed.

AT 500 FEET 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 must apply this paper procedure when required by the ECAM ENG DUAL FAILURE procedure. If time permits, clear ECAM alerts, and check the ECAM STATUS page.

– **OPTIMUM SPEED** 220 KT/GREEN DOT

Initially, fly 220 knots, 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 (1000 kg)	At or below FL 200	FL 300	FL 400
68	221	231	241
64	213	223	233
60	205	215	225
56	197	207	217
52	189	199	209
48	181	191	201
44	173	183	193
40	165	175	185

At green dot speed, the aircraft can fly up to approximately 2.5 NM per 1000 feet (with no wind). Average rate of descent is approximately 1600 feet/min.

– **LANDING STRATEGY** DETERMINE

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

– **VHF1/HF1 (if installed)/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

APPROACH PREPARATION

NOTE : Final descent slope, when configured (CONF 3/L/G DOWN), will be approximately 800 feet/NM (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 150 KT
- VAPP DETERMINE
Vapp is the maximum between Vref+25 knots / 150 knots.

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	155	159	163	167	171	173

● At a suitable altitude (not below 3000 feet 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 knots (max speed with slats extended).
- GND SPLR ARM
- MAX BRK PR 1000 PSI

AT 2000 FEET AGL

- CABIN NOTIFY FOR LANDING

AT 500 FEET AGL

- BRACE FOR IMPACT ORDER

AT TOUCHDOWN

- ENG MASTERS OFF
- BRAKES ON ACCU ONLY



**ENG DUAL FAILURE - NO FUEL REMAINING (Cont'd)****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
- VAPP DETERMINE
Vapp is the maximum between Vref+25 knots / 150 knots :

Weight (1000 kg)	40	44	48	52	56	60	64	68	72	76	78
Vapp	150	150	150	150	150	155	159	163	167	171	173

- At a suitable altitude (not below 3000 feet AGL), configure the aircraft for ditching (CONF 3 ; L/G UP)
 - L/G lever CHECK UP

AT 2000 FEET AGL

- CABIN NOTIFY FOR DITCHING
- DITCHING pushbutton ON
In case of strong crosswind, ditch face to the wind.
In the absence of strong crosswind, prefer ditching parallel to the swell. Touchdown with approximately 11 degrees of pitch and minimum aircraft vertical speed.

AT 500 FEET 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

DITCHING

This procedure applies when engines are running. If engines are not running, refer to the QRH "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/AS RQRD
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) 2182 KHZ or 8364 KHZ.
- CABIN and COCKPIT PREPARE
Loose equipment secured ; survival equipment prepared ; belts and shoulder harness locked.
- GPWS SYS OFF
- GPWS TERR OFF
- R - 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 FL100) OFF

APPROACH

- L/G lever UP
- SLATS and FLAPS MAX AVAIL

AT 2000 FEET AGL

- CAB PRESS MODE SEL CHECK AUTO
- BLEED (ENGs and APU) OFF
- CABIN NOTIFY FOR DITCHING
- DITCHING pushbutton ON
In case of strong crosswind, ditch face to the wind.
In the absence of strong crosswind, prefer ditching parallel to the swell. Touchdown with approximately 11 degrees of pitch and minimum aircraft vertical speed.

AT 500 FEET AGL

- R - BRACE FOR IMPACT ORDER

AT TOUCHDOWN

- R - ENG MASTERS OFF
- R - 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 "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/AS RQRD
*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) 2182 KHZ or 8364 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 FL100) OFF

APPROACH

- RAM AIR ON
- L/G lever DOWN
- SLATS AND FLAPS MAX AVAIL
- GND SPLR ARM
- MAX BRK PR 1000 PSI

AT 2000 FEET AGL

- CABIN NOTIFY FOR LANDING

AT 500 FEET AGL

- BRACE FOR IMPACT ORDER

AT TOUCHDOWN

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





FORCED LANDING (Cont'd)

AFTER LANDING

● When aircraft has stopped :

- PARKING BRK ON
- ATC (VHF1) NOTIFY
- FIRE pushbutton (ENG and APU) PUSH
- AGENTS (ENG and APU) DISCH

■ If Evacuation required :

- EVACUATION INITIATE

■ If Evacuation not required :

- CABIN CREW and PASSENGERS (PA) NOTIFY



EMER DESCENT

IMMEDIATE ACTIONS

– CREW OXY MASKS 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.

R – SIGNS ON

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

R R . If autothrust is engaged, check that THR IDLE is displayed on the FMA.

- . If not engaged, retard the thrust levers.

R – 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 feet. 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 (◀).

R – ENG MODE SEL IGN

– ATC NOTIFY

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.

R – MAX FL 100/MEA

● IF CAB ALT > 14000 feet :

– PAX OXY MASKS MAN ON

R *Contact the cabin crew to confirm that the passenger oxygen masks are released.*

WINDSHEAR

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

If windshear is detected either by the system or 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

■ 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 back stick, if demanded.

- NOTE :**
1. If engaged, the autopilot disengages when α is greater than α_{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.

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.

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 knots until 50 feet.

● When airborne

- THR LEVERS TOGA

As usual, the slat/flap configuration can be changed, provided the windshear is not entered.

- SRS ORDERS FOLLOW

NOTE : If engaged, the autopilot disengages when α is greater than α . prot.

■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

NOTE : If a positive verification is made that no hazard exists, the warning may be considered cautionary.

- GO AROUND PERFORM

This includes the use of full backstick, if required.

NOTE : 1. If engaged, the autopilot disengages when α is greater than α . 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 in the SUPPLEMENTARY TECHNIQUES 3.04.91.



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.

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 knots until 50 feet.

● When airborne

- THR LEVERS TOGA

As usual, the slat/flap configuration can be changed, provided the windshear is not entered.

- SRS ORDERS FOLLOW

NOTE : If engaged, the autopilot disengages when α is greater than α prot.

■ Landing

Associated with an aural synthetic voice "GO AROUND, WINDSHEAR AHEAD".

NOTE : If a positive verification is made that no hazard exists, the warning may be considered cautionary.

- THR LEVERS TOGA

- ANNOUNCE "GO AROUND-FLAPS"

- FLAPS RETRACT ONE STEP

- L/G UP SELECT

This includes the use of full backstick, if demanded.

NOTE : 1. If engaged, the autopilot disengages when α is greater than α 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 in the SUPPLEMENTARY TECHNIQUES 3.04.91.

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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 $\Delta P > 9$ PSI
PACK 1 + 2 OFF
LAND ASAP

Before 10 minutes from landing :

- PACK 1 + 2 OFF
- BLOWER + EXTRACT AUTO

CAUTION

Check that ΔP is zero before opening the doors.

TOO HOT/COLD COCKPIT AND CABIN TEMPERATURE IN FLIGHT

Apply the procedure if the cockpit and cabin temperature become too hot or too cold with the temperature selector at its maximum cold or hot selection :

- PACKS OUTLET TEMP (ON ECAM BLEED PAGE) CHECK
- IF DIFFERENCE BETWEEN BOTH PACKS IS BELOW 10°C :
 - AIR COND HOT AIR switch OFF
A difference between both packs lower than 10°C may reflect a mixer temperature sensor failure. Switching OFF the HOT AIR results in the use of the duct temperature sensors only and no longer in the use of the mixer temperature sensors. A normal cabin and cockpit temperature will be recovered.
- IF DIFFERENCE BETWEEN BOTH PACKS IS AT OR ABOVE 10°C :
 - PACK (WITH THE HIGHEST OUTLET TEMP) OFF
A difference between both packs of 10°C or greater than 10°C may reflect a contamination of packs resulting in too hot cabin and cockpit air temperature. The situation may be alleviated by switching OFF the pack discharging the hottest air.



AIR DUAL BLEED FAULT

■ If ENG 1 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 FL100/MEA, to prevent excessive cabin altitude.

AVOID ICING CONDITIONS

■ 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 FL225, 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

■ In all other cases :

- DESCENT INITIATE
Descend rapidly to FL225, 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 FL225, 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

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.

With respect to the Auto Flight System, and depending on when the flight plan is lost, the following two procedures list the actions to be performed, in their order of priority :

■ 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 or TERMINAL AREA**● 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.



LOW ENERGY WARNING

R The "SPEED SPEED SPEED" synthetic voice is triggered every 5 seconds whenever the aircraft energy goes below a threshold under which thrust shall be increased.

R – "SPEED SPEED SPEED"

R Increase the thrust until the warning stops and, depending on the circumstances, adjust the pitch accordingly.

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 two or more electrical latches (strikes) are faulty :

The cockpit door is not intrusion-proof.

The system may be recovered by performing the following steps :

– Cockpit door OPEN
 – COCKPIT DOOR toggle switch SET to UNLOCK

After 10 seconds :

– COCKPIT DOOR door toggle switch 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.



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. If turbulence, the pilot may decide to decelerate to a lower speed (not below VLS) to avoid VFE exceedance.

NOTE : . Autopilot may be used down to 500 feet 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.
- . VLS, displayed on the PFD, and OVERSPEED warning, 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), FLAPS lever can be set to the next required position while 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 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 on page 2.05 provides the MAX SPEEDS for abnormal configurations.

■ **IF SLATS FAULT**

● **FOR CIRCUIT**

- MAINTAIN SLAT/FLAP CONFIGURATION
- Recommended speed : MAX SPEED – 10 KT

● **FOR DIVERSION**

- SELECT CLEAN CONFIGURATION
Recommended speed for flaps retraction is between MAX SPEED - 10 KT and MAX SPEED.
- Recommended speed : MAX SPEED – 10 KT

■ **IF FLAPS FAULT**

● **FOR CIRCUIT**

- MAINTAIN SLAT/FLAP 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 knots and max speed of actual slat/flap position.*

- NORMAL OPERATING SPEEDS

- **If Flaps jammed > 0**

- MAINTAIN SLAT/FLAP CONFIGURATION
- Recommended speed : MAX SPEED – 10 KT

NOTE : . *In case of go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.*

- . *In some cases, MAX SPEED - 10KT may be a few knots higher than the VFE. In this situation, pilots may follow the VFE.*



LANDING WITH SLATS OR FLAPS JAMMED (cont'd)

MAX SPEED							
Flaps	Slats	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3	
R	S = 0	NO LIMITATION	230 kt	215 kt	200 kt	185 kt	
	0 < S < 1	177 kt (Not allowed)					
	S = 1	177 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 fuel flow indication.

As a guideline, determine the fuel consumption in clean configuration at 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 give the fuel consumption required to reach the destination in the current configuration.



F/CTL 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 the ECAM F/CTL 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
- R - AUTO BRK DO NOT USE
- R - FOR LANDING USE NORMAL CONF
- R - SPEED and TRAJECTORY STABILIZE ASAP
- R - LDG DIST PROC APPLY
Refer to the QRH Part 2, or to the FCOM 3.02.80.

ON GROUND

- DIFFERENTIAL BRAKING USE ASAP
Do not use asymmetric thrust reverse.
Use nosewheel steering handle below 70 knots.



STABILIZER JAM

The system 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 man 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 handling qualities.
- GPWS LDG FLAP 3 ON

R CAT 2 INOP

SIDESTICK/RUDDER PEDALS STIFF

R Even if the autopilot is disengaged, the sidesticks and/or the rudder pedals may be stiff. This R 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.

R The piloting technique remains the same : The aircraft remains responsive. However, the flight R crew should keep in mind that they may need to use extra force on the sidesticks and/or the R 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

**FUEL LEAK**

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

R 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 :

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

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

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

- FUEL X FEED MAINTAIN CLOSED
R The crossfeed valve must remain closed to prevent the leak from affecting both sides.

- CTR TK PUMP 1+2 OFF
R Each engine is fed via its associated inner tank only.

- INNER TANK FUEL QUANTITIES MONITOR
R Monitor the depletion rate of each inner tank.





FUEL LEAK (CONT'D)

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

- 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 tons (6600 lb) :

- CTR TK PUMP 1+2 ON

R

FOR LANDING**CAUTION****Do not use reversers.**

GRVITY FUEL FEEDING

– ENG MODE SEL IGN

AVOID NEGATIVE G FACTOR

● **DETERMINE GRAVITY FEED CEILING :**

R R Consult the following table to determine the flight altitude limitation.

Flight conditions at the time of gravity feeding	Gravity feed ceiling
Flight time above FL300 more than 30 minutes (Fuel deaerated)	Current FL*
Flight time above FL300 less than 30 minutes (Fuel non deaerated)	FL 300*
Aircraft flight level never exceeded FL300 (Fuel non deaerated)	FL150* or 7000 ft above takeoff airport, whichever is higher

* For JET B, gravity feed ceiling is FL100 in all cases.

DESCEND TO GRVITY FEED CEILING (if applicable).

● **WHEN REACHING GRVITY 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 DEG WING DOWN ON LIVE ENGINE SIDE
– RUDDER TRIM USE

● **WHEN FUEL IMBALANCE REACHES 1 000 kg (2200 lbs) :**

– BANK ANGLE 2 or 3 DEG WING DOWN
ON LIVE ENG SIDE

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. Refer to the FUEL LEAK procedure.

– 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

**DOUBLE AOA HEAT FAILURE****● If icing conditions cannot be avoided :**

- One of affected ADRs OFF
- NAV ADR DISAGREE

DISPLAY UNIT FAILURE**■ 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 ECAM DUs affected) USE
Transfer SD to the F/O or CAPT ND.
- PFD/ND XFR (if EFIS DUs affected) USE

■ INVALID DISPLAY UNIT message is displayed :*This may be caused by a DU failure.*

- FOR AUTOMATIC DU RECOVERY . . . WAIT MORE THAN 40s

● 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 is displayed (not on all DUs) :

- EIS DMC SWITCHING AS RQRD

● IF UNSUCCESSFUL :

- DU (affected) OFF THEN ON

NOTE : ND display may disappear, in case 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 seconds.

■ INVALID DATA is displayed on all DUs :*The autopilot, autothrust and MCDU navigation data, remain available.*

- FOR AUTOMATIC DUs RECOVERY . . . WAIT MORE THAN 40s

● IF ALL DUs ARE AUTOMATICALLY RECOVERED :

No crew action is required.

● IF ONE OR MORE DUs ARE NOT RECOVERED :

- Non-recovered DUs OFF FOR 40s.
- Non-recovered DUs BACK ON sequentially

● If the initial failure re-occurs (the 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 EWD and SD :

- ECAM UPPER DISPLAY OFF THEN ON
The action on the EIS DMC SWITCHING selector produces the same effect.



ECAM SINGLE DISPLAY

Only the EWD is available. 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 the STATUS is displayed.

- RELEASE IT, THEN PRESS IT AGAIN WITHIN 2 SECONDS

The second page of the STATUS is displayed.

- CONTINUE UNTIL THE OVERFLOW ARROW DISAPPEARS

When the STS key is released for more than 2 seconds, the EWD is displayed again.



RESIDUAL BRAKING PROC

■ IN FLIGHT :

- BRAKE PEDALS APPLY SEVERAL TIMES
Press the brakes pedals several times. This could zero a 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 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: In case of taxi with deflated or damaged tires, refer to the TAXI WITH DEFLATED TIRES procedure (FCOM 3.01.32, page 2).

L/G GRAVITY EXTENSION

- 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 the ECAM are lost. LDG GEAR lights on the LDG control panel remain available, if LGCIU1 is electrically-supplied.
3. The 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

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

● In case of NORM BRK FAULT, multiply the landing distance by :

- 2.35 on dry runway,
- 1.85 on wet runway,
- 1.90 on contaminated runway

● In case of G SYS LO PR, multiply the landing distance by :

- 2.50 on dry runway,
- 2.25 on wet runway,
- 2.75 on contaminated runway.

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LDG WITH ABNORMAL L/G

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 PAX from front to rear moves the CG roughly 4 % aft.
 - . 10 PAX 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



Cont'd



LDG WITH ABNORMAL L/G (cont'd)

FLARE, TOUCHDOWN 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 seconds after first engine shutdown.

– 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 onto 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 1000 psi) to maintain the runway axis as long as possible.

● If both MAIN L/G abnormal

- ENG MASTERS OFF
Shutdown 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 installed.

■ 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).

R

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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 :

- R – AP/FD OFF
- R – 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	67 t - 57 t	Below 57 t
CONF	Speed	Pitch (°) / Thrust (% N1)		
3	F	7.0 / 62.4	7.0 / 58.4	7.0 / 53.0
2	F	8.5 / 62.3	8.5 / 58.3	8.5 / 53.0
1+F	S	4.5 / 61.3	4.5 / 57.2	4.5 / 52.3
1	S	7.5 / 60.2	7.5 / 55.8	7.5 / 51.0
CLEAN				
FL	Speed	Pitch (°) / Thrust (% N1)		
Below FL 200	250 kts	3.5 / 64.7	3.0 / 62.3	2.0 / 60.3
FL 200 – FL 320	275 kts	2.5 / 78.7	2.0 / 76.8	1.0 / 75.3
Above FL 320	M 0.76	3.0 / 84.6	2.5 / 83.3	2.0 / 80.8

**UNRELIABLE SPEED INDICATION/ADR CHECK PROC (CONT'D)****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.
 - Refer to GPS altitude : altitude variations may be used to control level flight, and is an altitude cue.
 - Refer to Radio Altimeter.

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%.





UNRELIABLE SPEED INDIC/ADR CHECK PROC (CONT'D)

Affected ADR identification :

- Crosscheck all speed indications and refer to QRH 4.01 (for F, S speeds) or 5.01 (for speed in clean conf) :

■ 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 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

R

Multiply the landing distance by 1.45 on dry runways, by 1.4 on wet runways, or by 1.3 on contaminated runways.

■ To return to departure airport :

Keep takeoff configuration preferably
Refer to initial and intermediate approach, and final approach 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 the "Pitch/Thrust for initial level off" table).

Once in clean configuration, refer to climb, cruise, descent, approach tables for flight continuation.

■ Other cases :

Refer to climb, cruise, descent, approach tables for flight continuation.



R **UNRELIABLE SPEED INDICATION/ADR CHECK PROC (CONT'D)**

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 kts	10.5 / CLB	11.0 / CLB	12.5 / CLB
FL 50 - FL 100		10.5 / CLB	10.0 / CLB	11.0 / CLB
FL 100 - FL 150		8.0 / CLB	8.5 / CLB	9.5 / CLB
FL 150 - FL 200		7.0 / CLB	7.0 / CLB	7.5 / CLB
FL 200 - FL 250	275 kts	5.0 / CLB	5.0 / CLB	5.0 / CLB
FL 250 - FL 320		3.5 / CLB	3.5 / CLB	3.5 / 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 QRH 5.01 (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 kts	3.5 / 64.7	3.0 / 62.3	2.0 / 60.3
FL 200 - FL 320	275 kts	2.5 / 78.7	2.0 / 76.8	1.0 / 75.3
Above FL 320	M 0.76	3.0 / 84.6	2.5 / 83.3	2.0 / 80.8

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	-2.0 / IDLE
FL 320 - FL 200	275 kts	-0.5 / IDLE	-1.0 / IDLE	-2.0 / IDLE
FL 200 - FL 100	250 kts	1.0 / IDLE	0.0 / IDLE	-1.0 / IDLE
Below FL 100	250 kts	0.5 / IDLE	-0.5 / IDLE	-2.0 / IDLE
Below FL 100	G-DOT	1.5 / IDLE	2.0 / IDLE	2.0 / IDLE



R UNRELIABLE SPEED INDICATION/ADR CHECK PROC (CONT'D)

INITIAL AND INTERMEDIATE APPROACH IN LEVEL FLIGHT

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

R **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	5.0 / 58.7	5.0 / 54.4	5.5 / 50.0
1	S	7.5 / 60.3	7.5 / 56.0	7.5 / 51.2
1+F (a)	S	4.5 / 61.3	4.5 / 57.2	4.5 / 52.3
2	F	8.5 / 62.2	8.5 / 58.4	8.5 / 53.0

**LANDING GEAR DOWN IN LEVEL FLIGHT
(EXPECT GRVITY EXTENSION)**

3	F	7.0 / 67.7	7.0 / 63.3	7.5 / 58.6
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- (a) 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 - 57 t	Below 57 t
CONF	Speed (kts)	Pitch (°)/Thrust (% N1)		
3	VLS+10	4.0 / 49.7	4.0 / 45.8	4.0 / 42.1

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.

NAV FM/GPS POS DISAGREE

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

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

- A/C POS CHECK

R 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.
- Consider switching off the terrain functions of the GPWS.
- When possible, compare the FM position with 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 the 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.



ADR 1+2+3 FAULT

This procedure is not displayed on the ECAM. Only dual ADR warnings are displayed, in case of a triple ADR failure.

- ADR (all) OFF
- STBY INST (ALT + ASI) USE

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

F/CTL ALTN LAW (PROT LOST)

- MAX SPEED 320/.82
See the following table for the IAS/M relationship for .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 (Refer to 3.02.21) :

- MODE SEL MAN
- MAN V/S CTL AS RQD





ADR 1+2+3 FAULT (CONT'D)

STATUS

MAX SPEED 320/82
 RUD WITH CARE ABV 160 KT

At slats' extension, full rudder travel authority is recovered.

APPR PROC :

- FOR LDG USE FLAP 3
- GPWS LDG FLAP 3 ON
- APPR SPD VREF + 10 KT
- LDG DIST PROC APPLY

Multiply the landing distance by 1.35 on dry runway, or 1.30 on wet runway, or 1.25 on contaminated runway.

● 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

● DURING FINAL APPR

- V/S CTL FULL UP

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 :
 See below

NOTE 1 : *In case of a go-around, respect maximum speed 215 knots in CONF 1+F, due to the loss of flap auto retraction to CONF 1.*

CAUTION

Check that the outflow valve is fully open, and that cabin altitude is at airfield elevation before opening the doors.

Other inoperative systems

CAB PR 1+2
 RAT auto extension

ATC ALTI MODE

TCAS
 L/G RETRACT



NAV IR ALIGNMENT IN ATT MODE

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on the PFD and red HDG flag on the ND).

Aircraft attitude and heading may be recovered by applying the following procedure. The aircraft must stay level, with constant speed for 30 seconds.

- MODE SELECTOR ATT
- ALIGN light on for 30 seconds.
- ATT MODE displayed on the 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 heading must be entered 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 the aircraft's magnetic heading on the CDU keyboard. Then, press the ENT key to enter data.
Example : To enter a heading of 320°, dial 3, 2, 0, 0 then press ENT.
Heading will be displayed on the associated ND.
"HDG---ATT MODE" will be displayed on the CDU.
Due to IR drift, the magnetic heading has to be periodically crosschecked and updated with standby compass, if required.

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 must be achieved within 30 seconds after fuel flow increases.

- ENG PARAMETERS (N2, EGT) CHECK

If the START FAULT ENG STALL warning is triggered, although engine parameters are normal, disregard the warning.

■ When idle 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.

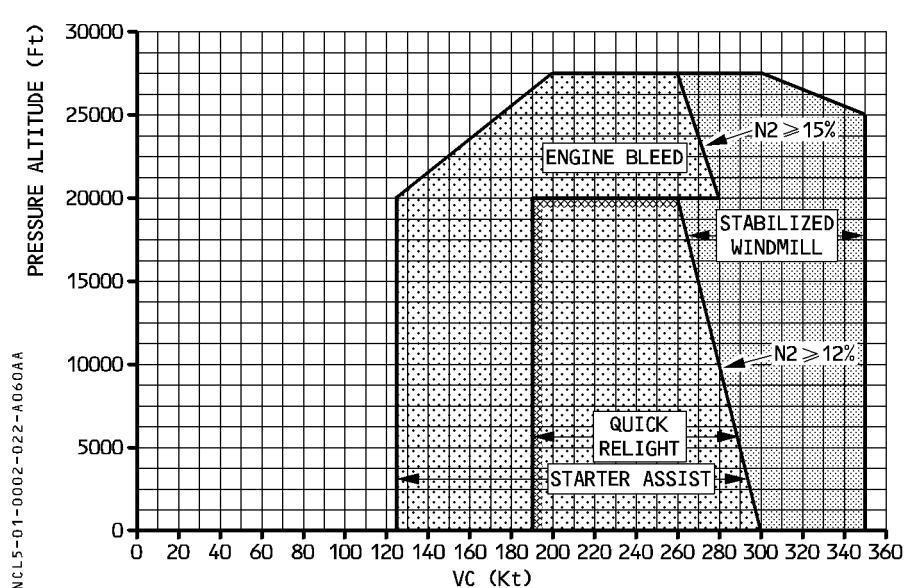
- Affected SYS RESTORE

■ If no relight :

- ENG MASTER (affected) OFF

Wait 30 seconds before attempting a new start (to drain the engine).

IN FLIGHT ENGINE RELIGHT ENVELOPE





ENG 1(2) STALL

■ N2 between 50 % and IDLE :

- ENG MASTER (affected engine) OFF
- ENG 1 (2) **SHUT DOWN**

■ N2 above IDLE (title and procedure not displayed on ECAM) :**● On ground :**

- ENG MASTER (affected engine) OFF

● In flight :

- THR LEVER (affected engine) IDLE
- ENG PARAMETERS (affected engine) CHECK

● Abnormal

- ENG MASTER (affected engine) OFF
- 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.

R

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

The ECAM's VIB advisory ($N1 \geq 6$ units, $N2 \geq 4.3$ 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 $N1$ 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-second 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.

**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.

R
R
R
R

NOTE : For weights greater than 70000 kg (or 154 000 lb), S speed is greater than VFE CONF 2 (200 knots). Consequently, on the FCU, the crew must select a speed below 200 knots 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 nosewheel 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 (1000 kg)

OAT °C	AIRPORT ELEVATION (FT)							
	0	2000	4000	6000	8000	10000	12000	14000
<10	85	83	84	81	77	71	66	61
15	85	83	83	81	77	70	64	57
20	85	83	83	81	75	67	61	55
25	85	83	83	79	72	64	58	
30	84	83	81	77	69			
35	84	83	79	73	66			
40	84	81	75	69				
45	82	76	70					
50	78	72						
55								

**COCKPIT WINDSHIELD/WINDOW CRACKED**

- MAX FL 230
- CAB PRESS MODE SEL MAN
- MAN V/S CTL AS RQRD

Set the cabin altitude, according to the table below.

ΔP =	FL	100	150	200	230
5 PSI	CABIN ALTITUDE	0	3000	6000	8000

● **When starting the final descent :**

- CAB PRESS MODE SEL AUTO

Note : 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.

COCKPIT WINDSHIELD/WINDOW ARCING

- Affected WINDOW/WINDSHIELD ANTI ICE C/B PULL

In case of electrical arcing, pull the circuit breaker of the affected window/windshield heating system :

- | | |
|-----------------------------|------------------------------|
| . ANTI ICE L WSHLD C/B AF10 | . ANTI ICE WINDOWS L C/B X14 |
| . ANTI ICE R WSHLD C/B AF03 | . ANTI ICE WINDOWS R C/B W14 |



VOLCANIC ASH ENCOUNTER

Accomplish the following, while making a 180° turn.

- ATC NOTIFY
- A/THR OFF
- THRUST (conditions permitting) DECREASE
- CREW OXYGEN MASKS ON/100%
- CABIN CREW NOTIFY
- PASSENGER OXYGEN AS RQRD
- ENG ANTI ICE ON
- WING ANTI ICE ON
- PACK FLOW HI
- APU START
- ENGINE PARAMETERS MONITOR
- AIRSPEED INDICATIONS MONITOR

If airspeed is unreliable or lost, use the UNRELIABLE SPEED INDICATION/ADR CHECK PROC procedure (2.15).

1. If both engines flame out and speed indications are lost, use the DUAL ENGINE FAILURE procedure (1.16) to get the optimum relight speed.
In case of engine failure, switch off the wing anti-ice before engine restart.
2. 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.



BOMB ON BOARD

IF POSSIBLE, LAND AND EVACUATE THE AIRCRAFT IMMEDIATELY.

If it is not possible to land and evacuate the aircraft within 30 minutes, 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 2500 feet difference between the aircraft and the cabin altitude.

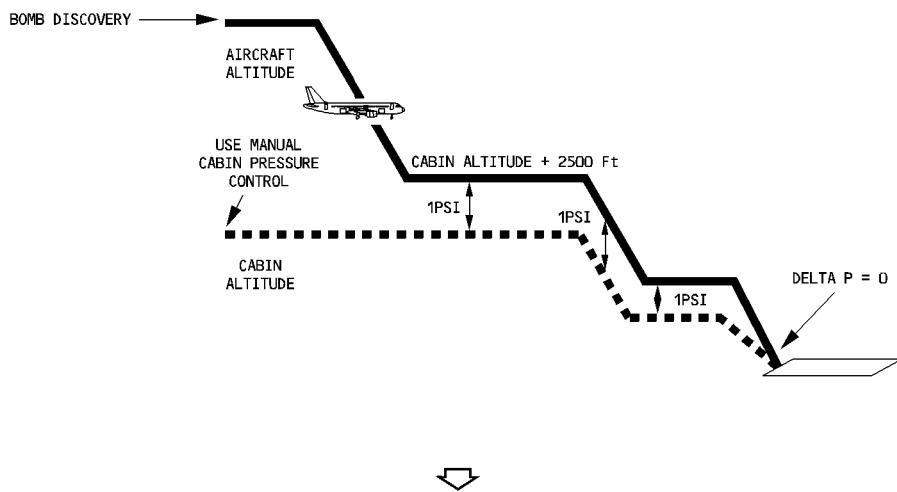
These conditions are achieved by using the manual pressure control.

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 + 2500 feet 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).



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**BOMB ON BOARD (Cont'd)**

- 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 + 2500 feet, 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 + 2500 FEET or MEA or minimum obstacle clearance altitude INITIATE
- AVOID SHARP MANEUVERS
- CAB ALT MAINTAIN

● When at CAB ALT + 2500 FEET :

- 1 PSI DELTA P MAINTAIN
- GALLEY OFF

● When the bomb is secured at the LRBL :

- 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



**BOMB ON BOARD (Cont'd)****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, DO NOT CUT WIRES, SECURE AGAINST SLIPPING, 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 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 an 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.



**BOMB ON BOARD (Cont'd)****R – EMERGENCY EQUIPMENTS REMOVE AND STOW**

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

R – GALLEY/IFE POWER OFF

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

R ● If the bomb can be moved :**R – RH AFT CABIN DOOR SLIDE DISARM****R – 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.

R – BOMB INDICATION LINE POSITION

NOTE : *A bomb location indicator line is a 6- to 8- foot (1.8 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.

R – 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.

R – 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.



BOMB ON BOARD (Cont'd)

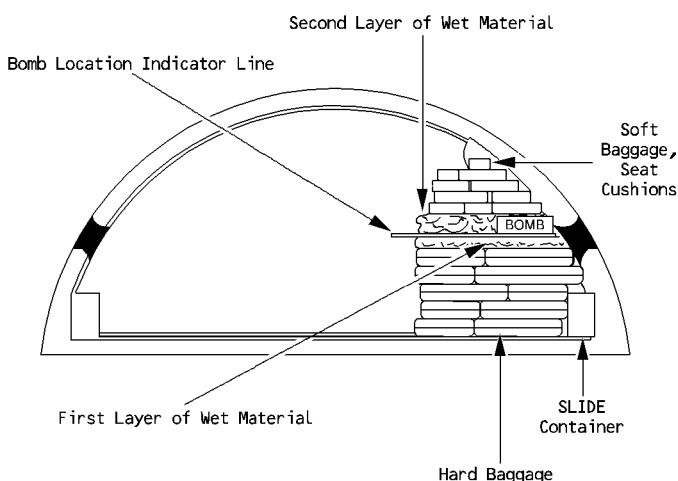
Build up at 25 cm (10 in) of wetted material around the sides and on top of the bomb. DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

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 or 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



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– 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.

R **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	132	136	140	144	148	150
	CG ≥ 25% 106	111	116	121	125	130	134	138	142	146	148

+

ΔVREF

See QRH 2.32

+

APPROach CORrection

if $\Delta VREF \leq 10$ kt	if 10 kt $< \Delta VREF < 20$ kt	if $\Delta VREF \geq 20$ kt
APPR COR is the Highest of 5 kt * if A/THR ON or in case of ice accretion ** 1/3 Headwind Max = 15 kt	APPR COR = 1/3 Headwind Max = 10 kt	APPR COR = 0 kt
APPR COR + $\Delta VREF$ Limited to 20 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

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R Example of VAPP calculation :

R Failure : ALTN LAW Flight Conditions : Autothrust ON, ice accretion

R Landing configuration : CONF 3 Headwind : 12 kt

R Landing Weight/CG : 48 T/25 %

R VREF determined from the landing weight/CG : 116 kt

R VREF correction due to the failure ($\Delta VREF$) : 10 kt

R As $\Delta VREF$ is equal to 10 kt, the APPROach CORrection (APPR COR) is the highest of :

R . 5 + 5 = 10 kt (ice accretion and landing in CONF 3)

R . 1/3 Headwind = 12 kt/3 = 4 kt

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

$$VAPP = VREF + \Delta VREF + APPR COR = 116 + 10 + 10 = 136 \text{ kt}$$

LDG CONF/APPR SPD/LDG DIST FOLLOWING FAILURES

R

A320 FAMILY	FAILURE	FLAPS LEVER POSITION FOR LDG	Δ VREF APPR SPD INCREMENT	MULTIPLY LDG DIST (CONF FULL) BY		
				DRY	WET (b)	CONTA (b)
ELEC	AC BUS 1 (a)	3 FULL	6 —	1.30 1.20	1.30 1.20	1.20 1.10
	DC BUS 2 (a)	3 FULL	6 —	1.40 1.25	1.50 1.35	1.40 1.25
	DC ESS BUS (a) if there is no ice accretion	3 FULL	6 —	1.30 1.20	1.40 1.25	1.30 1.20
	DC ESS BUS (a) if there is ice accretion	3 FULL	16 10	1.50 1.35	1.55 1.40	1.45 1.30
	DC EMER CONF (a)	3 FULL	6 —	3.35 3.05	2.80 2.55	2.50 2.25
	DC BUS 1+2 (a) if there is no ice accretion	3 FULL	6 —	2.15 1.95	1.80 1.65	1.60 1.45
	DC BUS 1+2 (a) if there is ice accretion	3 FULL	16 10	2.40 2.20	2.05 1.85	1.80 1.65
	EMER ELEC CONF	3	10	2.65	2.30	2.15
FTL CTL	ONE SPLR FAULT (a)	3 FULL	6 —	1.30 1.20	1.30 1.20	1.20 1.10
	TWO SPLR FAULT (a)	3 FULL	6 —	1.40 1.25	1.40 1.25	1.25 1.15
	THREE SPLR FAULT (a)	3 FULL	6 —	1.45 1.30	1.40 1.25	1.30 1.20
	ALL SPLR FAULT (a)	3 FULL	6 —	1.65 1.50	1.65 1.50	1.55 1.40
	SEC 1 or SEC 3 FAULT (a)	3 FULL	6 —	1.40 1.25	1.40 1.25	1.25 1.15
	SEC 2 FAULT (a)	3 FULL	6 —	1.30 1.20	1.30 1.20	1.20 1.10
	SEC 2+3 FAULT (a)	3 FULL	6 —	1.40 1.25	1.40 1.25	1.25 1.15
	SEC 1+3 FAULT (a)	3 FULL	6 —	1.50 1.35	1.60 1.45	1.55 1.40
	SEC 1+2 FAULT (a)	3 FULL	6 —	1.40 1.25	1.45 1.30	1.40 1.25
	RUDDER JAM (a)	3 FULL	6 —	1.65 1.50	1.55 1.40	1.50 1.35
	SEC 1+2+3 FAULT	3	10	1.60	2.20	2.25
	ALTN LAW/DIRECT LAW/ELAC 1+2/L+R ELEV FAULT/L(R) ELEV FAULT/STAB JAM	3	10	1.35*	1.30*	1.25*
FLAPS/ SLATS	FLAPS and SLATS at zero	1	60 (APPR) 50 (THRESHOLD)	2.40*	2.10*	2.10*
	FLAPS <1 S≥1	3	45	2.30*	2.00*	2.00*
	FLAPS <1 S≥1	3	25	1.95*	1.60*	1.60*
	1≤FLAPS<2 S<1	3	30	1.85*	1.70*	1.60*
	1≤FLAPS<2 S≥1	3	15	1.50*	1.45*	1.35*
	2≤FLAPS<3 S<1	3	25	1.70*	1.55*	1.50*
	2≤FLAPS<3 S≥1	3	10	1.40*	1.35*	1.25*
	FLAPS = 3 1≤S≤3 S>3	3 3 3	25 10 5	1.65* 1.35* 1.30*	1.55* 1.30* 1.25*	1.50* 1.25* 1.20*
FLAPS > 3	S<1			NOT ALLOWED		
	1≤S≤3	FULL	10	1.30*	1.30*	1.20*
	S>3	FULL	5	1.25*	1.25*	1.15*

- R (a) Flaps FULL and Flaps 3 are both acceptable positions. Flaps FULL is recommended, but the flight crew can use Flaps 3, if necessary, for operational reasons.
- R (b) The landing distance coefficients for wet or contaminated runways assume the use of maximum reverse thrust on all of the operative reversers. Apply these coefficients to the actual landing distance with reversers.

R	A320 FAMILY	FAILURE	FLAPS LEVER POSITION FOR LDG	$\Delta VREF$ APPR SPD INCREMENT	MULTIPLY LDG DIST (CONF FULL) BY		
					DRY	WET (b)	CONTA (b)
HYD	GREEN (a)	3 FULL	6 —	1.45 1.30	1.50 1.35	1.45 1.30	
	BLUE (a)	3 FULL	6 —	1.30 1.20	1.30 1.20	1.20 1.10	
	YELLOW (a)	3 FULL	6 —	1.40 1.25	1.45 1.30	1.30 1.20	
	GREEN + BLUE	3	25	1.80	2.00	1.95	
	GREEN + YELLOW	3	25	2.80	2.45	2.45	
	BLUE + YELLOW (a)	3 FULL	6 —	1.85 1.70	2.10 1.90	2.05 1.85	
BRK	ANTI SKID (a)	3 FULL	6 —	1.95 1.75	1.45 1.30	1.20 1.10	
	BRK RELEASED (a)	3 FULL	6 —	1.55 1.40	1.40 1.25	1.30 1.20	
	ALTN L(R) RELEASED (a) if NORM BRK FAULT	3 FULL	6 —	2.60 2.35	2.05 1.85	2.10 1.90	
	ALTN L(R) RELEASED (a) if G SYS LO PR	3 FULL	6 —	2.75 2.50	2.50 2.25	3.05 2.75	
	NORM BRK FAULT (a)	3 FULL	6 —	1.40 1.25	1.30 1.20	1.25 1.15	
	NORM + ALTN BRK FAULT (a)	3 FULL	6 —	1.95 1.75	1.45 1.30	1.20 1.10	
NAV	IR 1+2+3 FAULT	3	10	2.60	2.10	1.70	
	UNRELIABLE SPEED INDICATION/ ADR CHECK PROC	3	15	1.45*	1.4*	1.3*	
	DUAL IR FAULT/DUAL ADR FAULT ADR 1+2+3 FAULT	3	10	1.35*	1.30*	1.25*	
BLEED	WING ANTI ICE NOT AVAIL (a) if there is ice accretion	3 FULL	16 10	1.45 1.30	1.45 1.30	1.30 1.20	
ENG	REV UNLOCK with buffet (c)	1 3	55 (APPR) 40 (THRESHOLD)	2.15* 1.35*	2.05* 1.40*	2.05* 1.35*	

R (a) Flaps **FULL** and Flaps 3 are both acceptable positions. Flaps **FULL** is recommended, but the flight crew can use Flaps 3, if necessary, for operational reasons.

(b) The landing distance coefficients for wet or contaminated runways assume the use of maximum reverse thrust on all of the operative reversers. Apply these coefficients to the actual landing distance with reversers.

(c) The applicable landing configuration (CONF 1 or CONF 3) is displayed on the ECAM STATUS page.

* See below for multiple failures

USE OF THE TABLE (PREVIOUS PAGES)

- $\Delta VREF$ values take into account the necessary corrections, due to failures and the required landing configuration. The $\Delta VREF$ values are rounded off to take into account all possible weight ranges.

LDG DIST factors must be applied to the actual "LANDING DISTANCE WITHOUT AUTOBRAKE-CONFIGURATION FULL" (Refer to QRH 4.03).

- For a single failure :

- . Determine the LDG CONF to be selected
- . Determine the $\Delta VREF$
- . $VAPP = VREF + \Delta VREF + WIND CORRECTION$ (Refer to QRH 2.31).
- . Determine the LDG DIST factor.

- For multiple failures :

- . Only combine PRIMARY or SINGLE failures. In the case of a PRIMARY failure, the associated effects of SECONDARY(s) failure are taken into account by the $\Delta VREF$ and LDG DIST factor computation.
- . Use the lowest LDG CONF
- . Use the highest $\Delta VREF$ to compute the VAPP.
- . 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.

- R . Examples Applicable to Dry Runways :

FLAPS FAULT (F < 3, S ≥ 1)	LDG CONF 3	$\Delta VREF = 10 \text{ KT}$	$\text{LDG DIST} \times 1.40^*$
BRK ANTI SKID	LDG CONF FULL	$\Delta VREF = 0$	$\text{LDG DIST} \times 1.75$
TOTAL	LDG CONF 3	$\Delta VREF = 10 \text{ KT}$	$\text{LDG DIST} \times 2.45$

$$\begin{aligned} \text{VREF} = 131 \text{ KT} \rightarrow \text{VAPP} &= 131 + 10 + \text{WIND (10 KT MAX)} \\ &= 141 \text{ KT} + \text{WIND (10 KT MAX)} \end{aligned}$$

ALTN LAW	LDG CONF 3	$\Delta VREF = 10 \text{ KT}$	$\text{LDG DIST} \times 1.35^*$
FLAPS FAULT (F < 1, S ≥ 1)	LDG CONF 3	$\Delta VREF = 25 \text{ KT}$	$\text{LDG DIST} \times 1.95^*$
TOTAL	LDG CONF 3	$\Delta VREF = 25 \text{ KT}$	$\text{LDG DIST} \times 1.95$

$$\begin{aligned} \text{VREF} = 140 \text{ KT} \rightarrow \text{VAPP} &= 140 + 25 + 0 \text{ (No wind correction)} \\ &= 165 \text{ KT} \end{aligned}$$



TRIPPED C/B REENGAGEMENT

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

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

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.

PROCEDURE

To perform a computer reset :

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

WARNING

Do not reset more than one computer at the same time, unless instructed to do so.

NOTE : Due to the many customization possibilities of the C/B panel :

Before taking any action on the C/B panel, the flight crew must crosscheck that the C/B label corresponds to the affected system.

COMPUTER RESET TABLE

The computers most prone to reset are listed in the table below, along with the associated reset procedure or FCOM reference, when applicable.

Specific reset procedures included in OEB or Temporary revisions are not referenced in this table and, when issued, supercede 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. (Refer to 3.04.32).
- In flight, as a general rule, the crew must restrict computer resets to those listed in the table, or to those in applicable TRs or OEBs. Before taking any action on other computers, the flight crew must consider and fully understand the consequences.

CAUTION

Do not pull the following circuit breakers :

- SFCC (could lead to SLATS/FLAPS locked).
- ECU or EEC, EIU.

Also refer to the FCOM 3.04.24.

NOTE : In the table's "reset" column, the "if applicable" note signifies that, depending on the computer standard, the reset procedure may no longer be necessary. If this is the case, the reset procedure is removed from the applicable FCOM section.

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

ATA	System malfunction or ECAM Warning/Caution	Affected system	Reset
21	VENT AVNCS SYS FAULT	AEVC	<u>On ground only :</u> - Pull C/B Y 17 on 122VU. - Wait 1 second before pushing the C/B.
	AIR PACK REGUL FAULT	ACSC	<u>On ground only :</u> - Pull C/B W21 and W22 on 122VU. - Pull C/B X21 and X22 on 122VU. - Pull C/B Y18, Y20 and Y21 on 122VU. - Pull C/B D8 on 49VU. - Wait 5 seconds before pushing all the C/Bs.
NO CHANGE			

ATA	System Malfunction or ECAM Warning/Caution	Affected System	Reset
NO CHANGE			
R 23	Uncommanded EVAC horn activation	CIDS	<p>On ground, or in flight :</p> <p>Press the EVAC HORN SHUT OFF pushbutton. Set the EVAC CAPT and PURS/CAPT switch to the CAPT only position. Wait for 3 seconds.</p> <ul style="list-style-type: none">• IF UNSUCCESSFUL :<ul style="list-style-type: none">– Pull the C/Bs for DIR2 in the following order : G02 on 49VU, M06 on 121VU.– IF UNSUCCESSFUL :<ul style="list-style-type: none">– Pull the C/Bs for DIR1 in the following order : G01 on 49VU, M05 on 121VU.– Wait for 1 minute, then :– Push the C/Bs for DIR2 in the following order : M06, G02.– After CIDS reset, wait approximately 4 minutes, before recovering normal operation.
NO CHANGE			

ATA	System Malfunction or ECAM Warning/Caution	Affected System	Reset
22	AUTO FLT YAW DAMPER 1(2) FAULT	FAC 1(2)	Refer to the FCOM 3.02.22, if applicable.
	WINDSHEAR DET FAULT or REAC W/S DET FAULT (◀)	FAC 1 + 2	
	One MCDU locked, or blank Both MCDU locked, or blank FMGC malfunction	MCDU FMGC FMGC	Refer to the FCOM 4.06.20
23	COM CIDS 1+2 FAULT	CIDS	<u>On ground, or in flight :</u> - Pull the C/Bs in the following order : M05 and M06 on 121VU, G01 and G02 on 49VU. - Wait 10 seconds, then : - Push the C/Bs in the following order : G01, G02, M05, M06. - After CIDS reset, wait approximately 4 minutes, before recovering normal operation.
	Uncommanded EVAC horn actuation	CIDS	<u>On ground, or in flight :</u> Press the EVAC HORN SHUT OFF pushbutton. . IF UNSUCCESSFUL : - Pull the C/Bs in the following order : M05 and M06 on 121VU, G01 and G02 on 49VU. - Wait 10 seconds, then : - Push the C/Bs in the following order : G01, G02, M05, M06. - After CIDS reset, wait approximately 4 minutes, before recovering normal operation.
	Frozen RMP	RMP	Refer to FCOM 3.04.23.
	FAP freezing	FAP	<u>On ground, or in flight :</u> - Pull the C/Bs in the following order : H01 on 49VU, Q13 on 121VU. - Wait 10 seconds, then : - Push the C/Bs in the following order : Q13, H01.

ATA	System malfunction or ECAM Warning/Caution	Affected system	Reset
24	GPU cannot be connected to the aircraft	GAPCU	<p><u>On ground only :</u></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"> 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"> Reset the EXT PWR pushbutton switch on 35VU (Press and release) If no power source is connected to the electrical network of the aircraft. <ul style="list-style-type: none"> Set the BAT 1+2 pushbutton switches to AUTO.
27	F/CTL ELAC 1(2) FAULT F/CTL ALTN LAW F/CTL ELAC 1(2) PITCH FAULT	ELAC	<ul style="list-style-type: none"> Refer to the FCOM 3.02.27, if applicable.
	ELAC or SEC malfunction	ELAC or SEC	<p><u>WARNING :</u></p> <p>Do not reset more than one computer at a time.</p> <ul style="list-style-type: none"> 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. <p><u>Note :</u></p> <ul style="list-style-type: none"> When an ELAC reset is performed on ground, the crew must check the pitch trim position. If a reset is performed on ground, the flight crew must then perform a Flight Control check, as per SOP.

ATA	System malfunction or ECAM Warning/Caution	Affected system	Reset
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>On ground, or in flight :</p> <ul style="list-style-type: none">– Pull the C/B of the affected channel :<ul style="list-style-type: none">. Channel 1 A13 on 49VU. Channel 2 M27 on 121VU– Wait 5 seconds, before pushing the C/B. <p><i>Note : 1) The fuel quantity indication will be re-established within one minute.</i></p> <p><i>2) The fuel leak detection function will be lost for the remainder of the flight. The flight crew must monitor the fuel quantity according to FCOM 3.03.15.</i></p>

ATA	System malfunction or ECAM warning/caution	Affected system	Reset
NO CHANGE			

R 32	Braking malfunction	BSCU	Refer to 3.04.32
	<u>L/G LGCIU 1(2) FAULT</u>	LGCIU 1(2)	<p>On ground only :</p> <p>The flight crew must reset the LGCIU after depressurizing the green hydraulic system.</p> <ul style="list-style-type: none">- ENG MASTER switch 1 OFF- PTU OFF. When there is no green hydraulic pressure :<ul style="list-style-type: none">. To reset LGCIU 1 :<ul style="list-style-type: none">- Pull C/B Q34 on 121VU, then C09 on 49VU- Wait for 15 seconds, then push the C/Bs. To reset LGCIU 2 :<ul style="list-style-type: none">- Pull C/B Q35 on 121VU- Wait for 15 seconds, then push the C/B



ATA	System Malfunction or ECAM Warning/Caution	Affected System	REMARKS
30	ANTI ICE L(R)/WINDSHIELD (WINDOW)	WHC	Refer to the FCOM 3.02.30, if applicable.
31	<u>FWS FWC 1(2) FAULT</u>	FWC	<u>On ground :</u> Pull, then push, the C/B of the affected FWC : – FWC 1. F01 on 49VU – FWC 2. Q7 on 121VU Wait 50 seconds after pushing the C/Bs. <u>In flight :</u> Pull, then push, the C/B of the affected FWC : – FWC 1. F01 on 49VU – FWC 2. Q7 on 121VU
32	Braking Malfunction	BSCU	Refer to the 3.04.32.
	<u>L/G LGCIU 1(2) FAULT</u>	LGCIU 1(2)	<u>On ground only :</u> LGCIU 1 : Pull C/B Q34 on 121VU, then C09 on 49VU. Then push C/B C09 and C/B Q34. LGCIU 2 : Pull then push C/B Q35 on 121VU.
34	<u>NAV TCAS FAULT</u>	TCAS	<u>On ground only :</u> – Pull C/B K10 on 121VU. – Wait 5 seconds, then push the C/B.
	ISIS malfunction	ISIS	<u>On ground only :</u> With aircraft not moving : – Pull C/B F12 on 49VU, – Wait 5 seconds, then push the C/B, – Normal operation is expected after approximately 2 minutes. <i>NOTE : 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 seconds. Wait 2 additional minutes to recover normal operation.</i>
46	ATSU Malfunction	ATSU	An ATSU reset should be attempted, if : key selection has no effect on any of the MCDU ATSU DATALINK submenus. <u>On ground, or in flight :</u> – Pull the C/Bs in the following order : L16, L15 on 121VU – Wait 5 seconds, then : – Push the C/Bs in the following order : L15, L16.
70	<u>ENG IGN A+B FAULT</u>	FADEC and EIU	Refer to the FCOM 3.02.70, if applicable.
	<u>ENG 1(2) FADEC A(B) FAULT</u>	FADEC	Refer to the FCOM 3.02.70, if applicable.

ECAM ADVISORY CONDITIONS

SYSTEM	CONDITIONS	RECOMMENDED ACTION
R CAB PRESS	CAB VERTICAL SPEED V/S > 1800 ft/min	CPC changeover is recommended : MODE SEL MAN Wait 10 seconds, then : MODE SEL AUTO
	CAB ALTITUDE altitude ≥ 8800 ft	MODE SEL MAN Manual pressure control
R ELEC	CAB DIFF PRESS △P ≥ 1.5 psi in phase 7	LDG ELEV ADJUST If unsuccessful : MODE SEL MAN Manual pressure control
	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 is greater than 1500 kg (3307 lb).	FUEL MANAGEMENT CHECK If a fuel leak is suspected, refer to the FUEL LEAK procedure. For limitations, see 3.01.28.
	Fuel temp is 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 < 800 psi.	If mask is not being used, check if it is correctly stowed, as per FCOM 1.35.20.
APU	EGT > EGT MAX – 33°C (inhibited during APU start).	
	OIL QTY (LOW OIL LEVEL message pulses).	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 hours.



ECAM ADVISORY CONDITIONS (Cont'd)

SYSTEM	CONDITIONS	RECOMMENDED ACTION
ENG	OIL PRESS P < 16 PSI	<ul style="list-style-type: none"> If oil pressure is between 16 and 13 psi (advisory), continue normal operation. If oil pressure is below 13 psi (red indication), without the ENG OIL LO PR ECAM warning, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty). <p>In both cases, monitor other engine parameters, especially oil temperature and quantity.</p>
	OIL PRESS P > 90 PSI	<p>Closely monitor other engine parameters for symptoms of engine malfunction.</p> <p>If high oil pressure is not accompanied by other abnormal indications, operate the engine normally for the remainder of the flight.</p> <p>Record high oil pressure, and corresponding N2 readings, for maintenance action.</p>
	OIL TEMP T > 140°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><i>Note : If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature.</i></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"> 1. Low Speed - Increase engine speed to increase fuel flow, and thereby cool IDG oil. 2. High Speed - Reduce generator load, or turn off generator. If oil temperature continues to rise, mechanically disconnect IDG.
	OIL QTY < 3 qt	If oil quantity is low at a high power setting, expect level increase after power reduction.
	NAC TEMP ≥ 240°C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 6 units N2 ≥ 4,3 units	<p>Refer to the HIGH ENGINE VIBRATION procedure.</p> <p><i>Note : The advisory threshold may be decreased by a MCDU procedure at the level of vibration reached during the last flight.</i></p> <p><i>If this function has been activated, the N1 and N2 VIB indication will respectively pulse below 6 and 4.3.</i></p>



TAIL STRIKE

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

LAND ASAP

– MAX FL 100 or MSA

500 feet/minute 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 1000 feet/minute, 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

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 feet RA, the "L/G NOT DOWN" warning will be triggered. The pilot can cancel the aural warning by pressing the EMER CANC pushbutton, located on the ECAM control panel.

– A "TOO LOW GEAR" warning is to be expected, if the landing gear is not downlocked at 500 feet RA.

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 (1000 KG)

OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2000	4000	6000	8000	10000	12000	14000
0	77.0	76.0	69.0	63.0	58.0	53.0	48.0	45.0
5	77.0	76.0	69.0	63.0	58.0	53.0	48.0	45.0
10	77.0	76.0	69.0	63.0	58.0	53.0	48.0	45.0
15	77.0	76.0	69.0	63.0	58.0	53.0	48.0	45.0
20	77.0	76.0	69.0	63.0	58.0	53.0	48.0	45.0
25	77.0	75.0	69.0	63.0	58.0	53.0	48.0	45.0
30	77.0	72.0	68.0	63.0	58.0	53.0	48.0	
35	74.0	70.0	66.0	63.0	56.0	51.0		
40	71.0	67.0	63.0	59.0				
45	69.0	65.0	61.0					
50	67.0	63.0						
55	64.0							

R STRAIGHT-IN APPROACH WITH ONE ENGINE INOPERATIVE

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

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SAFETY EXTERIOR INSPECTION		
	PF	PNF
		* WHEEL CHOCKS CHECK IN PLACE * L/G DOORS CHECK POS. * APU AREA CHECK
PRELIMINARY COCKPIT PREP		
	PF	PNF
R		ENG MASTERS CHECK OFF ENG MODE SEL CHECK NORM L/G lever CHECK DOWN WIPERS OFF BAT CHECK/AUTO EXT PWR ON APU FIRE CHECK/TEST APU START * EXT PWR AS RORD * COCKPIT LIGHT AS QRD * PARKING BRAKE ON * ACCU/BRAKES PRESS CHECK ALTN BRAKING CHECK FLAPS CHECK POSITION * SPD BRK LEVER CHECK RET AND DISARMED PROBE/WINDOW HEAT AUTO APU BLEED ON AIR COND panel SET ELEC panel CHECK VENT panel CHECK EMER GEN – STAT INV CHECK * ECAM RECALL PRESS * ECAM OXY PRESS/HYD QTY/ENG OIL QTY CHECK
	*OEB IN QRH	CHECK EMER EOPT CHECK RAIN REPELLENT CHECK C/B panels CHECK * EXT. WALKAROUND PERFORM

COCKPIT PREPARATION		
	PF	PNF
	* GEAR PINS & COVERS CHECK <u>OVERHEAD PANEL</u>	
	* ALL WHITE LIGHTS EXTINGUISH	
	* RCDR GND CTL ON	
	CVR TEST	
	EVAC AS RQRD	
	* ADIRS NAV	
	EXTERIOR LIGHTS AS RQRD	
	* SIGNS SET	
	LDG ELEV AUTO	
	* PACK FLOW AS RQRD	
	BAT CHECK	
	ENG FIRE CHECK/TEST	
	AUDIO SWITCH NORM	
	PA (3rd occupant) RECEPT	
	MAINT PANEL CHECK	
R	CTR INSTRUMENT PANEL :	
R	* ISIS CHECK	
R	* CLOCK CHECK/ADJUST	
R	* A/SKID N/W STRG ON	
R	PEDESTAL :	
R	ACP1 CHECK	
R	* WEATHER RADAR SET	
R	SWITCHING PANEL NORM	
R	* ECAM STATUS CHECK	
R	* LDG ELEV (ECAM) CHECK AUTO	
R	* THRUST LEVERS CHECK IDLE	
R	* ENG MASTER CHECK OFF	
R	* ENG MODE SEL CHECK NORM	
R	PARKING BRAKE PRESS CHECK	
R	GRAVITY GEAR EXTN CHECK STOWED	
R	ACP2 CHECK	
R	ATC SET	
	RMP SET	
	* AIRFIELD DATA OBTAIN	
	* ATC CLEARANCE OBTAIN	
	* ACARS  INITIALIZE	
	* FMGS INITIALIZATION :	
	ENGINE & AIRCRAFT TYPE CHECK	
	DATABASE VALID CHECK	
	NAVAID DESELECTION AS RQRD	
	F-PLN INITIALIZATION COMPLETE	
	ALIGN IRS AS APPROPRIATE	
	F-PLN A COMPLETE AND CHECK	
	WINDS CLB/CRZ INSERT	
	F-PLN CHECK	
	SEC F-PLN AS APPROPRIATE	
	RADIO NAV CHECK	
	* FMGS DATA INSERTION :	
R	ZFWCG, ZFW, BLOCK FUEL INSERT	
	TAKEOFF DATA INSERT	
	PRESET SPEEDS AS RQRD	

Cont'd

. When both pilots are seated :

<u>GLARESHIELD</u> :	<u>GLARESHIELD</u> :
* BARO REF SET	* BARO REF SET
* FD CHECK ON	* FD CHECK ON
* LS AS RQRD	* LS AS RQRD
* ND mode and range SET	* ND mode and range SET
* VOR/ADF sel AS RQRD	* VOR/ADF sel AS RQRD
* FCU SET	
<u>LATERAL CONSOLE</u> :	<u>LATERAL CONSOLE</u> :
OXY MASK TEST	OXY MASK TEST
<u>PF INSTRUMENT PANEL</u> :	<u>PNF INSTRUMENT PANEL</u> :
PFD-ND brightness ADJUST	PFD-ND brightness ADJUST
LOUDSPEAKER SET	LOUDSPEAKER SET
* PFD-ND CHECK	* PFD-ND CHECK
	<u>* FMGS DATA CONFIRMATION</u> :
	AIRFIELD DATA CONFIRM
	ATC CLEARANCE OBTAIN
	IRS ALIGN CHECK
	GROSS WEIGHT INSERTION CHECK
	TO DATA CALCULATE/CHECK
	F-PLN A and B CHECK
* FUEL QTY CHECK	* ATC CODE SET
* TAKEOFF BRIEFING PERFORM	* FUEL QTY CHECK

BEFORE PUSHBACK or START

PF	PNF
LOADSHEET	CHECK (CM1)
TO DATA ENTER/REVISE	TO DATA CHECK
SEAT BELTS ADJUST	SEAT BELTS ADJUST
MCDU PERF TO	MCDU F-PLN
EXT PWR	CHECK OFF
BEFORE START C/L DOWN TO THE LINE	
NW STRG DISC CHECK AS RQRD	PUSHBACK/START CLEAR OBTAIN
WINDOWS/DOORS CHECK	WINDOWS CHECK
THR LEVERS IDLE	BEACON ON
PARKING BRAKE AS RQRD	
BEFORE START C/L BELOW THE LINE	

ENGINE START		
	PF	PNF
ENG MODE SEL	IGN/START	
ANNOUNCE	"STARTING ENGINE 2"	
MASTER SW 2	ON	
START VALVE		
N2		
IGNITER		
FUEL FLOW		
EGT		
N1		
OIL PRESS		
START VALVE CLOSES AT OR ABOVE :		
. 50 % N2 CFM or PW		
. 43 % N2 IAE		
ENG IDLE PARAMETERS	CHECK	
ANNOUNCE	"STARTING ENGINE 1"	
REPEAT THE START SEQUENCE		

AFTER START		
	PF	PNF
ENG MODE SEL	NORM	
APU BLEED	OFF	GND SPOILERS ARM
ENG ANTI-ICE	AS RQRD	RUD TRIM ZERO
WING ANTI-ICE	AS RQRD	FLAPS SET
APU MASTER SW	AS RQRD	PITCH TRIM SET
		ECAM DOOR PAGE CHECK
If STS label is displayed :		
ECAM STATUS CHECK		

TAXI		
	PF	PNF
NOSE LIGHT	TAXI	TAXI CLEARANCE OBTAIN
Taxi clearance obtained :		
PARKING BRAKE	OFF	ELAPSED TIME AS RQRD
THRUST LEVERS	AS RQRD	
BRAKES	CHECK	
FLT CTL	CHECK	FLT CTL CHECK
ATC clearance obtained :		
		ATC CLEARANCE CONFIRM
		TO DATA CHECK
		FMGS F-PLAN/SPD CHECK
		FCU ALT/HDG SET
		BOTH FD CHECK ON
FLT INST & FMA	CHECK	FLT INST & FMA CHECK
		RADAR and PREDICTIVE WINDSHEAR
		SYSTEM  AS RQRD
TERR ON ND 	AS RQRD	ATC CODE CONFIRM/SET
		TERR ON ND  AS RQRD
		AUTO BRK MAX
TO BRIEFING	CONFIRM	
CABIN REPORT RECEIVE (CM1)		
BEFORE TO C/L DOWN TO THE LINE		
		TO CONFIG PRESS
		TO MEMO CHECK NO BLUE

ENGINE START		
	PF	PNF
R	ENG MODE selector	IGN/START
	ENG 2 START	ANNOUNCE
	ENG MASTER switch 2	ON
	START VALVE	
	N2	
	IGNITER	
	FUEL FLOW	
	EGT	
	N1	
	OIL PRESS	
	START VALVE CLOSES AT OR ABOVE :	
	. 50 % N2 CFM or PW	
	. 43 % N2 IAE	
	ENG IDLE PARAMETERS	CHECK
R	ENG 1 START	ANNOUNCE
	REPEAT THE START SEQUENCE	

AFTER START		
	PF	PNF
	ENG MODE selector	NORM
	APU BLEED	OFF
	ENG ANTI-ICE	AS RQRD
	WING ANTI-ICE	AS RQRD
	APU MASTER switch	AS RQRD
		If STS label is displayed :
		ECAM STATUS CHECK
R	CLEAR TO DISCONNECT	ANNOUNCE
R	AFTER START C/L	

TAXI		
	PF	PNF
	NOSE LIGHT	TAXI
	. Taxi clearance obtained :	
	PARKING BRAKE	OFF
	THRUST LEVERS	AS RQRD
	BRAKES	CHECK
	FLT CTL	CHECK
	. ATC clearance obtained :	
		ATC CLEARANCE CONFIRM
		TO DATA CHECK
		FMGS F-PLAN/SPD CHECK
		FCU ALT/HDG SET
		BOTH FD CHECK ON
	FLT INST & FMA	CHECK
		FLT INST & FMA CHECK
		RADAR and PREDICTIVE WINDSHEAR
		SYSTEM  AS RQRD
		ATC CODE CONFIRM/SET
	TERR ON ND 	AS RQRD
		AUTO BRK MAX
	TO BRIEFING	CONFIRM
	CABIN REPORT	RECEIVE (CM1)
		TO CONFIG PRESS
		TO MEMO CHECK NO BLUE
	BEFORE TO C/L DOWN TO THE LINE	

BEFORE TAKEOFF	
PF	PNF
	TAKOFF/LINE UP CLEARANCE OBTAIN TCAS < TA or TA/RA
APPROACH CLEAR OF TRAFFIC	CHECK
SLIDING TABLE < STOW	PACKS 1+2 AS RQRD
CABIN CREW ADVISE	EXTERIOR LIGHTS SET
THRUST BUMP < AS RQRD	QFU/THRESHOLD CONFIRM
BEFORE TAKEOFF C/L BELOW THE LINE	SLIDING TABLE < STOW
	BRAKE TEMP (if fans < running) CHECK
	BRAKE FANS (if fans < running) OFF
	ENG MODE selector AS RQRD

TAKEOFF	
PF	PNF
TAKEOFF ANNOUNCE	
BRAKES RELEASE	
THRUST LEVERS TOGA/FLEX	
When thrust is set, the Captain places hand on thrust levers until V1	
R DIRECTIONAL CONTROL USE RUDDER	
CHRONO START	CHRONO START
FMA ANNOUNCE	PFD/ND CHECK
R • BELOW 80 KT :	N1 (EPR) CHECK
	THRUST SET ANNOUNCE
	PFD/ENG PARAMETERS SCAN
R • AT 100 KT :	
R 100 KT CHECK	ONE HUNDRED KNOTS ANNOUNCE
• AT V1 :	V1 ANNOUNCE
• AT VR :	ROTATION ORDER
ROTATION PERFORM	
• WHEN V/S POSITIVE :	POSITIVE CLIMB ANNOUNCE
R LDG GEAR UP ORDER	LDG GEAR SELECT UP
	GND SPOILERS DISARM
	EXTERIOR LIGHTS SET
AP AS RQRD	
FMA ANNOUNCE	
• AT THR RED ALT :	
THRUST LEVERS CL	
R FMA ANNOUNCE	PACK 1 (if applicable) ON
• AT ACCEL ALT :	
FMA ANNOUNCE	
• AT F SPEED :	
R FLAPS 1 ORDER	FLAPS 1 SELECT
• AT S SPEED :	
R FLAPS 0 ORDER	FLAPS 0 SELECT
R	PACK 2 (if applicable) ON

AFTER TAKEOFF	
PF	PNF
	APU BLEED/MASTER switch AS RQRD
	ENG MODE selector AS RQRD
	TCAS < TA/RA
	ANTI ICE AS RQRD
AFTER TO/CLIMB C/L DOWN TO THE LINE	



BEFORE TAKEOFF		
	PF	PNF
R		TAKEOFF/LINE UP CLEARANCE OBTAIN
R		TCAS □ TA or TA/RA
R	APPROACH CLEAR OF TRAFFIC	CHECK
R		PACKS 1+2 AS RQRD
R		EXTERIOR LIGHTS SET
R		QFU/THRESHOLD CONFIRM
R	SLIDING TABLE □ STOW	SLIDING TABLE □ STOW
R	CABIN CREW ADVISE	BRAKE TEMP (if fans □ running) CHECK
R	THRUST BUMP □ AS RQRD	BRAKE FANS (if fans □ running) OFF
R	BEFORE TAKEOFF C/L BELOW THE LINE	ENG MODE SEL AS RQRD

TAKEOFF		
	PF	PNF
R	TAKEOFF ANNOUNCE	
R	BRAKES RELEASE	
R	THRUST LEVERS TOGA/FLEX	
	When thrust is set, the Captain places hand on thrust levers until V1	
R	CHRONO START	CHRONO START
R	FMA ANNOUNCE	PFD/ND CHECK
R	• BELOW 80 KT :	N1 (EPR) CHECK
R	• AT 100 KT :	THRUST SET ANNOUNCE
R	• AT V1 :	PFD/ENG PARAMETERS SCAN
R	• AT VR :	ONE HUNDRED KNOTS ANNOUNCE
R	ROTATION PERFORM	V1 ANNOUNCE
R	• WHEN V/S POSITIVE :	ROTATION ANNOUNCE
R		POSITIVE CLIMB ANNOUNCE
R	AP AS RQRD	LDG GEAR SELECT UP
R	FMA ANNOUNCE	GND SPOILERS DISARM
R	• AT THR RED ALT :	EXTERIOR LIGHTS SET
R	THRUST LEVERS CL	
R	FMA ANNOUNCE	PACK 1 ON
R	• AT ACCEL ALT :	
R	FMA ANNOUNCE	
R	• AT F SPEED :	FLAPS 1 SELECT
R	• AT S SPEED :	FLAPS 0 SELECT
R		PACK 2 ON

AFTER TAKEOFF		
	PF	PNF
		APU BLEED/MASTER SW AS RQRD
		ENG MODE SEL AS RQRD
		TCAS □ TA/RA
		ANTI ICE AS RQRD
	AFTER TO/CLIMB C/L DOWN TO THE LINE	

CRUISE	
PF	PNF
ECAM MEMO/SYS PAGES	REVIEW
FLIGHT PROGRESS	CHECK
FUEL	MONITOR
NAV ACCURACY	CHECK
RADAR TILT	ADJUST
CABIN TEMP	MONITOR

DESCENT PREPARATION			
PF		PNF	
LDG ELEV	CHECK	LANDING DATA	PREPARE
FMGS	PREPARE	FMGS	PREPARE
		GPWS LDG FLAP 3	AS RQRD
APPR BRIEFING	PERFORM		
AUTO BRK	AS RQRD	DESCENT CLEARANCE	OBTAIN
		ANTI ICE	AS RQRD

DESCENT		
PF		PNF
DESCENT	INITIATE	
ANNOUNCE	FMA	FMA CHECK
MCDU	PROG/PERF DESCENT	MCDU F-PLN
DESCENT	MONITOR	
SPEEDBRAKES	AS RQRD	
RADAR TILT	ADJUST	
. When cleared to altitude :		
BARO REF	SET/X CHECK	
TERR ON ND < 	AS RQRD	TERR ON ND < AS RQRD
		ECAM STATUS CHECK
• At 10000 feet :		
		LAND LIGHTS ON
		SEAT BELTS ON/AUTO
EFIS OPTION	CSTR	EFIS OPTION CSTR
LS pushbutton	AS RQRD	LS pushbutton AS RQRD
		RADIO NAV SELECT/IDENT
• If GPS PRIMARY not available :		
NAV ACCY	CHECK	NAV ACCY CHECK

ILS APPROACH			
	PF	PNF	
Initial approach :			
SEAT BELTS	ON/AUTO	ENG MODE selector	AS RQD
Approx 15 NM from touchdown :			
APPR PHASE	ACTIVATE or set green dot	NAV ACCURACY	MONITOR
POSITIONING	MONITOR		
RADAR TILT	ADJUST		
APPR C/L			
Intermediate/Final approach :			
When cleared for ILS approach :			
APPR	PRESS		
BOTH AP	ENGAGE		
At green dot :			
R FLAPS 1	ORDER CHECK OR SET S SPEED *	FLAPS 1 TCAS \triangleleft	SELECT TA or TA/RA
FMA	ANNOUNCE	FMA	CHECK
LOC CAPTURE	MONITOR		
G/S CAPTURE	MONITOR		
	GO AROUND ALT *		SET
At 2000 feet AGL			
R FLAPS 2	ORDER CHECK OR SET F SPEED *	FLAPS 2	SELECT
When FLAPS 2			
R LDG GEAR DOWN	ORDER	LDG GEAR	SELECT DOWN
		AUTO BRAKE	CONFIRM
		GRND SPLRS	ARM
		EXTERIOR LIGHTS	SET
When L/G down, below VFE			
R FLAPS 3	ORDER	FLAPS 3 ECAM WHEEL PAGE	SELECT CHECK
When FLAPS 3, below VFE :			
R FLAPS FULL	ORDER CHECK OR SET VAPP *	FLAPS FULL A/THR WING A. ICE (if not required)	SELECT CHECK SPD or OFF
SLIDING TABLE \triangleleft	STOWED	SLIDING TABLE \triangleleft LDG MEMO	STOWED CHECK NO BLUE
	CABIN REPORT	OBTAINT (CM1)	
	CABIN CREW	ADVISE	
LDG C/L			
ANNOUNCE ANY FMA MODIFICATION		FLT PARAMETERS Announce any deviation in excess of: V/S : 1000 feet/mn IAS : speed target + 10 kt ; VAPP - 5 knots LOC : 1/4 dot LOC GLIDE : 1 dot GS PITCH : 2.5° nose down ; 10° nose up BANK : 7°	CHECK
At DH + 100 feet (or MDA/MDH + 100)		ONE HUNDRED ABOVE . . .	MONITOR OR ANNOUNCE
At DH (or MDA/MDH) :			
CONTINUE OR GO-AROUND	ANNOUNCE	MINIMUM	MONITOR OR ANNOUNCE

* PF if AP is ON, PNF if AP is OFF. The PF may request that this action is performed by the PNF depending on the situation.

ILS APPROACH		
	PF	PNF
Initial approach :		
SEAT BELTS	ON/AUTO	ENG MODE sel AS QRND
Approx 15 NM from touchdown :		
APPR PHASE	ACTIVATE or set green dot	
POSITIONING	MONITOR	NAV ACCURACY MONITOR
RADAR TILT	ADJUST	
APPR C/L		
Intermediate/Final approach :		
When cleared for ILS approach :		
APPR	PRESS	
BOTH AP	ENGAGE	
R At green dot :		
	FLAPS 1	SELECT
	CHECK OR SET S SPEED *	
	TCAS □	TA or TA/RA
R FMA	FMA	CHECK
R LOC CAPTURE	MONITOR	
R G/S CAPTURE	MONITOR	
	GO AROUND ALT *	SET
R At 2000 feet AGL		
	FLAPS 2	SELECT
	CHECK OR SET F SPEED *	
R When FLAPS 2		
	LDG GEAR	SELECT DOWN
	AUTO BRAKE	CONFIRM
	GRND SPLRS	ARM
	EXTERIOR LIGHTS	SET
R When L/G down, below VFE		
	FLAPS 3	SELECT
	ECAM WHEEL PAGE	CHECK
R When FLAPS 3, below VFE :		
	FLAPS FULL	SELECT
	CHECK OR SET VAPP *	
	A/THR	CHECK SPD or OFF
	WING A. ICE (if not required)	OFF
R SLIDING TABLE □	STOWED	SLIDING TABLE □ STOWED
	LDG MEMO	CHECK NO BLUE
	CABIN REPORT	OBTAINT (CM1)
	CABIN CREW	ADVISE
LDG C/L		
ANNOUNCE ANY FMA MODIFICATION		FLT PARAMETERS CHECK
		Announce any deviation in excess of :
		V/S : 1000 feet/mn
		IAS : speed target + 10 kt ; VAPP - 5 knots
		LOC : 1/4 dot LOC
		GLIDE : 1 dot GS
		PITCH : 2,5° nose down ; 10° nose up
		BANK : 7°
R At DH + 100 feet (or MDA/MDH + 100) :		ONE HUNDRED ABOVE . . . MONITOR OR ANNOUNCE
R At DH (or MDA/MDH) :		
CONTINUE OR GO-AROUND	ANNOUNCE	MINIMUM MONITOR OR ANNOUNCE

R * PF if AP is ON, PNF if AP is OFF. The PF may request that this action is performed by the PNF depending on the situation.

NON PRECISION APPROACH (MANAGED GUIDANCE)
 NON ILS APPROACH IN NAV DATA BASE, AND, NAV ACCY CHECK POSITIVE

PF	PNF
Initial approach :	
SEAT BELTS	ON/AUTO
Approx 15 NM from touchdown :	
APPR PHASE	ACTIVATE or set green dot
POSITIONING	MONITOR
RADAR TILT	ADJUST
APPR C/L	
Intermediate/Final approach :	
When cleared for approach :	
APPR	PRESS
R At green dot :	
ND MODE RANGE	AS RQRD
FMA	ANNOUNCE
	FLAPS 1 SELECT
	CHECK OR SET S SPEED *
	TCAS \triangleleft TA or TA/RA
	ND MODE RANGE AS RQRD
	FMA CHECK
R At S speed :	
	FLAPS 2 SELECT
	CHECK OR SET F SPEED*
R When FLAPS 2	
	LDG GEAR SELECT DOWN
	AUTO BRAKE CONFIRM
	GRND SPLRS ARM
	EXTERIOR LIGHTS SET
R When L/G down, below VFE	
	FLAPS 3 SELECT
	ECAM WHEEL PAGE CHECK
R When FLAPS 3, below VFE :	
	FLAPS FULL SELECT
	CHECK OR SET VAPP*
After the FAF :	
	FINAL APP CHECK
	GA ALTITUDE SET
	A/THR CHECK SPD or OFF
R POSITION/FLT PATH	MONITOR
R SLIDING TABLE\triangleleft	STOW
	WING A. ICE (if not required) OFF
	SLIDING TABLE \triangleleft STOW
	LDG MEMO CHECK NO BLUE
R LDG C/L	
ANNOUNCE ANY FMA MODIFICATION	CABIN REPORT OBTAIN (CM1)
	CABIN CREW ADVISE
	FLT PARAMETERS CHECK
	Announce any deviation in excess of :
	V/S : 1000 ft/mn
	IAS : speed target + 10 kt ; VAPP - 5 kt
	PITCH : 2.5° nose down ; 10° nose up
	BANK : 7°
	COURSE : 1/2 dot or 2.5° (VOR) ; 5° (ADF)
R At MDA + 100 ft :	ONE HUNDRED ABOVE . . . MONITOR OR ANNOUNCE
R At MDA/MDH	
CONTINUE OR GO-AROUND	ANNOUNCE
AP (if applicable)	OFF
	MINIMUM MONITOR OR ANNOUNCE

R * PF if AP is ON, PNF if AP is OFF. The PF may request that this action is performed by the PNF depending on the situation.

NON PRECISION APPROACH (MANAGED GUIDANCE)
 NON ILS APPROACH IN NAV DATA BASE, AND, NAV ACCY CHECK POSITIVE

PF	PNF
Initial approach : SEAT BELTS ON/AUTO	ENG MODE selector AS RQRD
Approx 15 NM from touchdown : APPR PHASE ACTIVATE or set green dot POSITIONING MONITOR RADAR TILT ADJUST APPR C/L	NAV ACCURACY MONITOR
Intermediate/Final approach : When cleared for approach : APPR PRESS	
At green dot : R FLAPS 1 ORDER ND MODE RANGE AS RQRD FMA ANNOUNCE	FLAPS 1 SELECT CHECK OR SET S SPEED * TCAS \triangleleft TA or TA/RA ND MODE RANGE AS RQRD FMA CHECK
At S speed : R FLAPS 2 ORDER	FLAPS 2 SELECT CHECK OR SET F SPEED *
When FLAPS 2 R LDG GEAR DOWN ORDER	LDG GEAR SELECT DOWN AUTO BRAKE CONFIRM GRND SPLRS ARM EXTERIOR LIGHTS SET
When L/G down, below VFE R FLAPS 3 ORDER	FLAPS 3 SELECT ECAM WHEEL PAGE CHECK
When FLAPS 3, below VFE : R FLAPS FULL ORDER	FLAPS FULL SELECT CHECK OR SET VAPP*
After the FAF : POSITION/FLT PATH MONITOR SLIDING TABLE \triangleleft STOW	FINAL APP CHECK GA ALTITUDE SET A/THR CHECK SPD or OFF WING A. ICE (if not required) OFF SLIDING TABLE \triangleleft STOW LDG MEMO CHECK NO BLUE
CABIN REPORT CABIN CREW	OBTAINT (CM1) ADVISE
LDG C/L ANNOUNCE ANY FMA MODIFICATION	FLT PARAMETERS CHECK Announce any deviation in excess of : V/S : 1000 ft/mn IAS : speed target + 10 kt ; VAPP - 5 kt PITCH : 2.5° nose down ; 10° nose up BANK : 7° COURSE : 1/2 dot or 2.5° (VOR) ; 5° (ADF)
At MDA + 100 ft :	ONE HUNDRED ABOVE . . . MONITOR OR ANNOUNCE
At MDA/MDH CONTINUE OR GO-AROUND ANNOUNCE AP (if applicable) OFF	MINIMUM MONITOR OR ANNOUNCE

* PF if AP is ON, PNF if AP is OFF. The PF may request that this action is performed by the PNF depending on the situation.

NON PRECISION APPROACH (SELECTED GUIDANCE)
NON ILS APPROACH NOT IN NAV DATA BASE, OR, NAV ACCY CHECK NEGATIVE

PF	PNF
Initial approach : SEAT BELTS ON/AUTO	ENG MODE selector AS RORD
Approx 15 NM from touchdown : APPR PHASE ACTIVATE or set green dot POSITIONING MONITOR RADAR TILT ADJUST APPR C/L	NAV ACCURACY MONITOR
Final approach : At green dot : R FLAPS 1 ORDER	FLAPS 1 SELECT CHECK OR SET S SPEED *
ND MODE RANGE AS RORD	TCAS \triangleleft TA or TA/RA ND MODE RANGE AS RORD
At S speed : R FLAPS 2 ORDER	FLAPS 2 SELECT CHECK OR SET F SPEED *
When FLAPS 2 R LDG GEAR DOWN ORDER	LDG GEAR SELECT DOWN AUTO BRAKE CONFIRM GRND SPLRS ARM EXTERIOR LIGHTS SET
When L/G down, below VFE : R FLAPS 3 ORDER	FLAPS 3 SELECT ECAM WHEEL PAGE CHECK
When FLAPS 3, below VFE R FLAPS FULL ORDER	FLAPS FULL SELECT CHECK OR SET VAPP*
AT the FAF : SET FPA TO FINAL APPROACH PATH*	
After the FAF : SET GA ALTITUDE ON FCU*	
POSITION/FLT PATH CHECK/ADJUST	A/THR CHECK SPD or OFF WING A. ICE (if not required) OFF
SLIDING TABLE \triangleleft STOW	SLIDING TABLE \triangleleft STOW LDG MEMO CHECK NO BLUE
CABIN REPORT OBTAIN (CM1)	
CABIN CREW ADVISE	
LDG C/L ANNOUNCE ANY FMA MODIFICATION	FLT PARAMETERS CHECK Announce any deviation in excess of: V/S : 1000 ft/mn IAS : speed target + 10 kt ; VAPP - 5 kt PITCH : 2.5° nose down ; 10° nose up BANK : 7° COURSE : 1/2 dot or 2.5° (VOR) ; 5° (ADF)
At MDA + 100 ft :	ONE HUNDRED ABOVE . . . MONITOR OR ANNOUNCE
At MDA/MDH : CONTINUE OR GO AROUND ANNOUNCE AP (if applicable) OFF	MINIMUM MONITOR OR ANNOUNCE

* PF if AP is ON, PNF if AP is OFF. The PF may request that this action is performed by the PNF depending on the situation.

NON PRECISION APPROACH (SELECTED GUIDANCE)
 NON ILS APPROACH NOT IN NAV DATA BASE, OR, NAV ACCY CHECK NEGATIVE

	PF	PNF
Initial approach :		
SEAT BELTS	ON/AUTO	ENG MODE SEL AS RQRD
Approx 15 NM from touchdown :		
APPR PHASE	ACTIVATE or set green dot	NAV ACCURACY MONITOR
POSITIONING	MONITOR	
RADAR TILT	ADJUST	
APPR C/L		
Final approach :		
R At green dot :		FLAPS 1 SELECT
	CHECK OR SET S SPEED *	TCAS < TA or TA/RA
ND MODE RANGE	AS RQRD	ND MODE RANGE AS RQRD
R At S speed :		FLAPS 2 SELECT
	CHECK OR SET F SPEED *	
R When FLAPS 2		LDG GEAR SELECT DOWN
R		AUTO BRAKE CONFIRM
R		GRND SPLRS ARM
R		EXTERIOR LIGHTS SET
R When L/G down, below VFE :		FLAPS 3 SELECT
		ECAM WHEEL PAGE CHECK
R When FLAPS 3, below VFE		FLAPS FULL SELECT
	CHECK OR SET VAPP*	
AT the FAF :		SET FPA TO FINAL APPROACH PATH*
After the FAF :		SET GA ALTITUDE ON FCU*
POSITION/FLT PATH	CHECK/ADJUST	
R SLIDING TABLE <	STOW	A/THR CHECK SPD or OFF WING A. ICE (if not required) OFF SLIDING TABLE < STOW LDG MEMO CHECK NO BLUE
R		CABIN REPORT OBTAIN (CM1)
R	CABIN CREW ADVISE	
LDG C/L		
ANNOUNCE ANY FMA MODIFICATION		FLT PARAMETERS CHECK Announce any deviation in excess of : V/S : 1000 ft/mn IAS : speed target + 10 kt ; VAPP - 5 kt PITCH : 2.5° nose down ; 10° nose up BANK : 7° COURSE : 1/2 dot or 2.5° (VOR) ; 5° (ADF)
R At MDA + 100 ft :		ONE HUNDRED ABOVE . . . MONITOR OR ANNOUNCE
R At MDA/MDH :		MINIMUM MONITOR OR ANNOUNCE
R	CONTINUE OR GO-AROUND ANNOUNCE AP (if applicable) OFF	

R * PF if AP is ON, PNF if AP is OFF. The PF may request that this action is performed by the PNF depending on the situation.

LANDING			
	PF	PNF	
R	In stabilized approach conditions, at approx. 30 Feet :		
	FLARE	PERFORM	ATTITUDE MONITOR
	THRUST LEVERS	IDLE	
	At touchdown :		
R	REV	MAX	GRND SPLRS CHECK/ANNOUNCE
R	BRAKES	AS RQRD	REVERSERS CHECK/ANNOUNCE
R			DECELERATION CHECK/ANNOUNCE
	At 70 knots :		
R	REV	IDLE	70 KT ANNOUNCE
	At taxi speed :		
	REV	STOW	
	Before 20 knots :		
	AUTOBRK	DISENGAGE	

GO AROUND			
	PF	PNF	
	THRUST LEVERS	TOGA	
R	ROTATION	PERFORM	
R	GO-AROUND	ANNOUNCE	
R	FMA	ANNOUNCE	FLAPS RETRACT ONE STEP
R			POSITIVE CLIMB ANNOUNCE
	At GA thrust red. altitude :		LDG GEAR SELECT UP
	THRUST LEVERS	CL	NAV or HDG SELECT
	At GA accel altitude :		
	SPEED	MONITOR	FLAPS RETRACT ON SCHEDULE

LANDING		
PF	PNF	
In stabilized approach conditions, at approx. 30 Feet :		
FLARE	PERFORM	ATTITUDE MONITOR
THRUST LEVERS	IDLE	
At touchdown :		
REV	MAX	GRND SPLRS CHECK/ANNOUNCE
BRAKES	AS RQRD	REVERSERS CHECK/ANNOUNCE
		DECCELERATION CHECK/ANNOUNCE
At 70 knots :		
REV	IDLE	70 KT ANNOUNCE
At taxi speed :		
REV	STOW	
Before 20 knots :		
AUTOBRK	DIENGAGE	

GO AROUND		
PF	PNF	
THRUST LEVERS	TOGA	
ROTATION	PERFORM	
GO AROUND	ANNOUNCE	
FMA	ANNOUNCE	FLAPS RETRACT ONE STEP
R	LDG GEAR UP	POSITIVE CLIMB ANNOUNCE
	ORDER	LDG GEAR SELECT UP
		NAV or HDG SELECT
At GA thrust red. altitude :		
THRUST LEVERS	CL	
At GA accel altitude :		
SPEED	MONITOR	FLAPS RETRACT ON SCHEDULE



AFTER LANDING	
PF	PNF
GRND SPLRS	DISARM <i>(signal for PNF to commence after landing items)</i>
AFTER LDG C/L	LAND LIGHTS RETRACT STROBE LIGHTS AUTO OTHER EXT LIGHTS AS RQRD RADAR OFF/STBY PREDICTIVE WINDSHEAR OFF ENG MODE SEL NORM FLAPS RETRACT TCAS SET on standby ATC AS RQRD APU START ANTI ICE AS RQRD BRAKE TEMP CHECK

PARKING	
PF	PNF
ACCU PRESS	CHECK
PARKING BRK	ON
ENG MASTER 1, 2	OFF
GROUND CONTACT	ESTABLISH
BEACON LT	OFF
OTHER EXTERIOR LIGHTS	AS RQRD
SEAT BELTS	OFF
PARKING BRK	AS RQRD
DUs	DIM
PARKING C/L	

SECURING THE AIRCRAFT	
PF	PNF
PARKING BRK	CHECK ON
ADIRS (1+2+3)	OFF
SECURING THE A/C C/L	OXY CREW SUPPLY OFF EXTERIOR LIGHTS OFF MAINT BUS SW AS RQRD APU BLEED OFF APU MASTER SW OFF EMER EXIT LIGHT OFF NO SMOKING OFF EXT PWR AS RQRD BAT 1 + 2 OFF

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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 knots 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	130	134	138	142	146	148
VLS CONF 3 (KT)	110	115	120	125	130	135	139	143	147	151	153

+

CORRECTION

5KT⁽¹⁾ 1/3 HEADWIND
(EXCLUDING GUST)
MAX=15KT

WHICHEVER IS HIGHER

=

-VAPP-

$$V_{APP}^{(2)} = \text{MAX}(VLS + 5Kt^{(1)}; VLS + W_{IND} \text{ CORR})$$

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- (1) The 5-knot 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 knots in CONF FULL
 - VLS + 10 knots in CONF 3
 In case of strong or gusty crosswind greater than 20 knots, Vapp should be at least VLS + 5 knots. The 5 knot increment above VLS may be increased up to 15 knots at the flight crew's discretion.

R

SPEEDS

OPERATING SPEEDS (KT)

CG $\geq 25\%$

W (1000 KG)	F	S	Green dot FL < 200*	V _{LS} CONF 3	V _{REF}
40	117	152	165	110	106
44	122	159	173	115	111
48	128	166	181	120	116
52	133	173	189	125	121
56	138	179	197	130	125
60	143	185	205	135	130
64	148	192	213	139	134
68	152	197	221	143	138
72	157	203	229	147	142
76	161	209	237	151	146
78	163	211	241	153	148

For CG < 25 % add 2 knots to V_{LS} and V_{REF}

* Above FL200 add 1 knot per additional 1000 feet

LANDING DISTANCE WITHOUT AUTOBRAKE

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.

CONFIGURATION 3

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)		46	50	54	58	62	66	70	74	78	
RUNWAY CONDITION	DRY		750	780	820	860	910	1000	1100	1200	1290
	WET		1020	1090	1160	1240	1320	1400	1480	1570	1650
	COVERED WITH	6.3 MM (1/4INCH) WATER	1340	1430	1540	1660	1790	1930	2060	2200	2310
		12.7 MM (1/2INCH) WATER	1300	1380	1480	1590	1710	1830	1950	2080	2180
		6.3 MM (1/4INCH) SLUSH	1300	1390	1470	1560	1650	1760	1890	2010	2110
		12.7 MM (1/2INCH) SLUSH	1250	1340	1420	1500	1590	1690	1800	1910	2000
		COMPACTED SNOW	1300	1380	1460	1540	1620	1700	1780	1850	1910
		ICE	2970	3110	3260	3410	3560	3720	3880	4040	4170

CORRECTIONS

	CORRECTION ON ACTUAL LANDING DISTANCE							
	dry runway	wet runway	runway covered with					
			1/4 inch water	1/2 inch water	1/4 inch slush	1/2 inch slush	compacted snow	ice
per 1000 ft above SL	+ 3 %	+ 4 %	+ 4 %	+ 4 %	+ 5 %	+ 5 %	+ 3 %	+ 4 %
per 10 kt headwind								
No correction for headwind due to wind correction on approach speed								
per 10 kt tailwind	+ 18 %	+ 21 %	+ 24 %	+ 21 %	+ 22 %	+ 20 %	+ 17 %	+ 29 %
forward C.G.	+ 2 %	+ 3 %	+ 3 %	+ 3 %	+ 3 %	+ 3 %	+ 3 %	+ 3 %
2 reversers operative	- 3 %	- 9 %	- 12 %	- 11 %	- 11 %	- 10 %	- 9 %	- 26 %
Per 5 kt speed increment (and no failure) add 8% (all runways)								

NOTE : – THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT

– BEFORE DEPARTURE REFER TO FCOM

LANDING DISTANCE WITHOUT AUTOBRAKE

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.

CONFIGURATION FULL

ACTUAL LANDING DISTANCE (METERS)											
WEIGHT (1000 KG)		46	50	54	58	62	66	70	74	78	
RUNWAY CONDITION		DRY	700	730	770	800	840	910	990	1080	1170
		WET	920	980	1040	1110	1180	1240	1320	1390	1460
		6.3 MM (1/4INCH) WATER	1220	1300	1380	1480	1590	1700	1810	1930	2020
		12.7 MM (1/2INCH) WATER	1190	1260	1340	1430	1530	1630	1730	1840	1930
		6.3 MM (1/4INCH) SLUSH	1180	1260	1340	1420	1500	1580	1670	1770	1860
		12.7 MM (1/2INCH) SLUSH	1150	1220	1300	1370	1450	1530	1610	1700	1780
		COMPACTED SNOW	1190	1270	1340	1410	1480	1550	1620	1700	1750
		ICE	2570	2690	2820	2950	3090	3230	3370	3510	3620

CORRECTIONS

	CORRECTION ON ACTUAL LANDING DISTANCE							
	dry runway	wet runway	runway covered with					
			1/4 inch water	1/2 inch water	1/4 inch slush	1/2 inch slush	compacted snow	ice
per 1000 ft above SL	+ 3 %	+ 3 %	+ 4 %	+ 4 %	+ 5 %	+ 4 %	+ 3 %	+ 4 %
per 10 kt headwind	No correction for headwind due to wind correction on approach speed							
per 10 kt tailwind	+ 18 %	+ 21 %	+ 23 %	+ 21 %	+ 22 %	+ 20 %	+ 18 %	+ 31 %
forward C.G.	+ 2 %	+ 3 %	+ 3 %	+ 3 %	+ 3 %	+ 3 %	+ 3 %	+ 3 %
2 reversers operative	- 3 %	- 8 %	- 10 %	- 10 %	- 9 %	- 8 %	- 8 %	- 24 %
Per 5 kt speed increment (and no failure) add 8% (all runways)								

NOTE : – THE ABOVE DISTANCES ARE GIVEN FOR USE IN FLIGHT
 – BEFORE DEPARTURE REFER TO FCOM

AUTOLAND LANDING DISTANCE WITH AUTOBRAKE

CONFIGURATION 3

R	ACTUAL LANDING DISTANCE (METERS)						CORRECTIONS (%) ON LANDING DISTANCE						
	WEIGHT (1000 KG)		40	50	60	70	80	PER 1000FT ABOVE SL	2 REV. OP.	PER 10KT TAIL WIND	PER 10KT HEAD WIND	FWD CG	
RUNWAY CONDITION	MODE	DRY	MED	1360	1450	1570	1670	1770	+ 3	-3	+ 12	-3	+ 2
	LOW	DRY	LOW	1850	2020	2240	2450	2650	+ 3	0	+ 15	-3	+ 2
	WET	DRY	MED	1400	1520	1680	1840	1990	+ 4	-3	+ 18	-4	+ 3
	LOW	DRY	LOW	1850	2020	2240	2450	2650	+ 3	0	+ 15	-3	+ 2
C	6.3 MM (1/4 INCH) WATER	DRY	MED	1630	1830	2110	2390	2660	+ 4	-12	+ 22	-4	+ 3
O	LOW	DRY	LOW	1820	2000	2250	2530	2790	+ 4	-2	+ 18	-3	+ 2
V	12.7 MM (1/2 INCH) WATER	DRY	MED	1570	1750	1990	2240	2490	+ 4	-10	+ 20	-4	+ 3
E	LOW	DRY	LOW	1780	1960	2180	2420	2660	+ 3	-1	+ 17	-3	+ 2
R	6.3 MM (1/4 INCH) SLUSH	DRY	MED	1590	1730	1950	2200	2430	+ 5	-11	+ 21	-4	+ 3
E	LOW	DRY	LOW	1770	1940	2150	2370	2600	+ 4	-1	+ 17	-3	+ 2
D	12.7 MM (1/2 INCH) SLUSH	DRY	MED	1530	1660	1850	2060	2270	+ 5	-10	+ 20	-4	+ 3
W	LOW	DRY	LOW	1740	1910	2110	2310	2510	+ 4	-1	+ 15	-3	+ 2
I	COMPACTED SNOW	DRY	MED	1600	1720	1870	2000	2120	+ 3	-9	+ 16	-3	+ 3
T	LOW	DRY	LOW	1820	1980	2200	2390	2580	+ 4	-1	+ 15	-3	+ 3
H	ICE	DRY	MED	3290	3550	3890	4230	4550	+ 4	-25	+ 29	-5	+ 3
	LOW	DRY	LOW	3320	3580	3930	4270	4590	+ 4	-25	+ 28	-5	+ 3

CONFIGURATION FULL

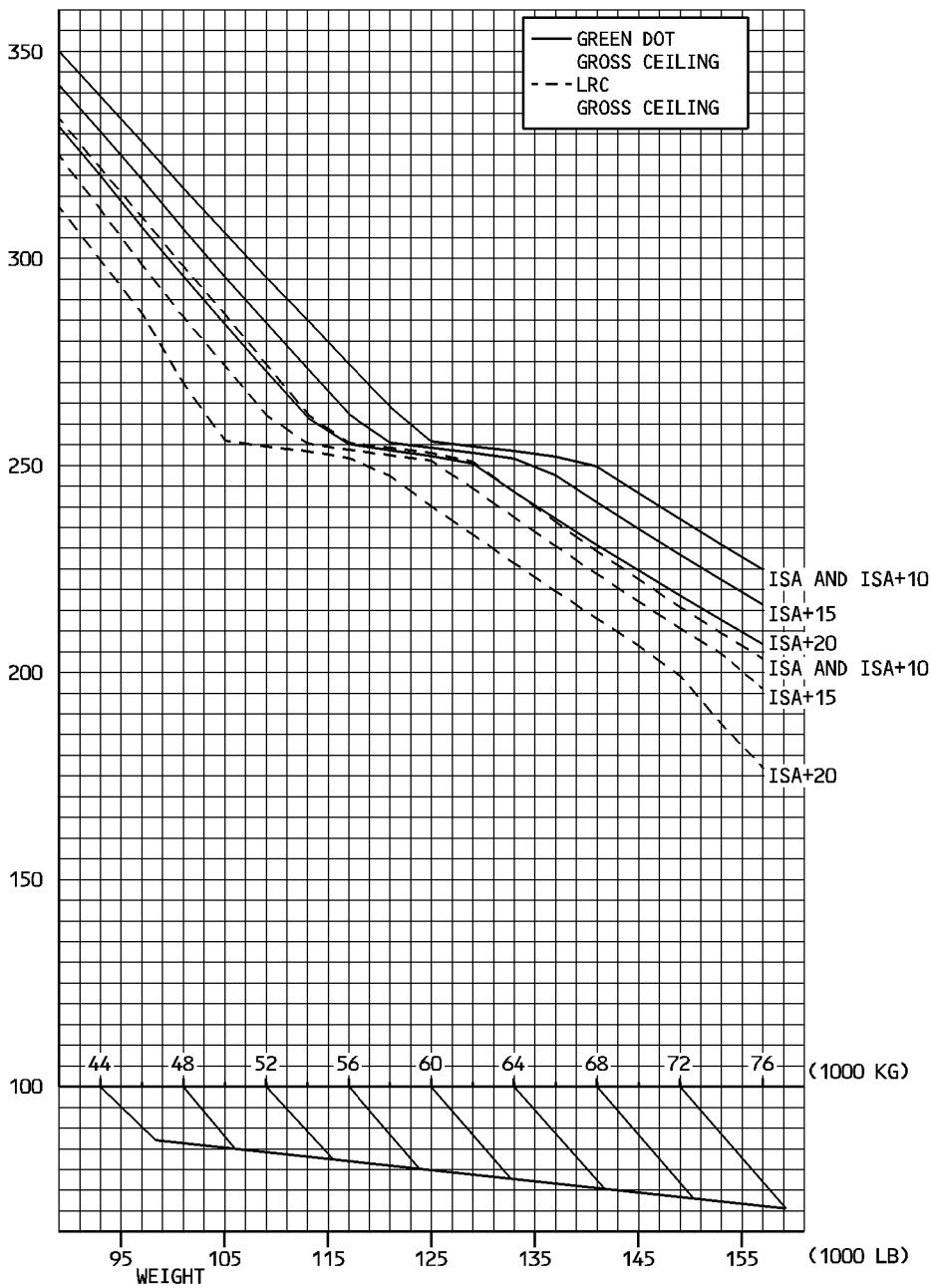
R	ACTUAL LANDING DISTANCE (METERS)						CORRECTIONS (%) ON LANDING DISTANCE						
	WEIGHT (1000 KG)		40	50	60	70	80	PER 1000FT ABOVE SL	2 REV. OP.	PER 10KT TAIL WIND	PER 10KT HEAD WIND	FWD CG	
RUNWAY CONDITION	MODE	DRY	MED	1330	1390	1520	1620	1730	+ 3	0	+ 13	-3	+ 2
	LOW	DRY	LOW	1800	1910	2130	2340	2530	+ 3	0	+ 16	-3	+ 2
	WET	DRY	MED	1340	1420	1570	1720	1860	+ 3	0	+ 17	-4	+ 3
	LOW	DRY	LOW	1800	1910	2130	2340	2530	+ 3	0	+ 16	-3	+ 2
C	6.3 MM (1/4 INCH) WATER	DRY	MED	1540	1670	1910	2150	2390	+ 4	-10	+ 21	-4	+ 3
O	LOW	DRY	LOW	1770	1880	2110	2330	2560	+ 3	-1	+ 17	-3	+ 2
V	12.7 MM (1/2 INCH) WATER	DRY	MED	1490	1600	1830	2050	2260	+ 4	-8	+ 20	-4	+ 4
E	LOW	DRY	LOW	1730	1850	2070	2280	2490	+ 3	-1	+ 16	-3	+ 2
R	6.3 MM (1/4 INCH) SLUSH	DRY	MED	1500	1610	1790	2000	2210	+ 5	-9	+ 21	-5	+ 3
E	LOW	DRY	LOW	1730	1840	2050	2240	2430	+ 4	-1	+ 16	-3	+ 2
D	12.7 MM (1/2 INCH) SLUSH	DRY	MED	1450	1550	1710	1900	2090	+ 4	-8	+ 20	-4	+ 3
W	LOW	DRY	LOW	1690	1800	2010	2200	2390	+ 4	0	+ 15	-3	+ 2
I	COMPACTED SNOW	DRY	MED	1520	1610	1750	1880	2000	+ 3	-7	+ 16	-4	+ 3
T	LOW	DRY	LOW	1770	1880	2090	2280	2460	+ 4	-1	+ 16	-3	+ 2
H	ICE	DRY	MED	2920	3110	3420	3730	4010	+ 4	-23	+ 30	-5	+ 3
	LOW	DRY	LOW	2940	3130	3450	3760	4040	+ 4	-21	+ 30	-5	+ 3

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 KNOTS (AND NO FAILURE) INCREASE LANDING DISTANCE BY 5 % (ALL RUNWAYS).

R

ONE ENGINE OUT MAX ALTITUDE

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

NCL5-00-0004-005-A170AD

CORRECTIONS

R		ISA	ISA + 10	ISA + 15	ISA + 20
LONG RANGE	ENGINE ANTI ICE ON	– 200 FT	– 1200 FT	– 1800 FT	– 7800 FT
	TOTAL ANTI ICE ON	– 900 FT	– 3900 FT	– 9600 FT	– 11700 FT
GREEN DOT	ENGINE ANTI ICE ON	– 200 FT	– 1200 FT	– 1200 FT	– 2000 FT
	TOTAL ANTI ICE ON	– 1200 FT	– 3400 FT	– 4200 FT	– 4900 FT

ONE ENGINE OUT

GROSS FLIGHT PATH DESCENT AT GREEN DOT SPEED - 1 ENGINE OUT							
MAX. CONTINUOUS THRUST PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	DISTANCE (NM)		TIME (MIN)	
			INITIAL SPEED (KT)	FUEL (1000KG)	LEVEL OFF (FT)		
INIT. GW (1000KG)	INITIAL FLIGHT LEVEL		250	290	310	330	350
50			83 16 196 .4 30700	205 38 198 1.0 31000	253 47 200 1.2 31200	284 52 202 1.3 31200	308 56 204 1.4 31300
52			170 32 200 .9 29900	237 44 202 1.2 30000	273 51 204 1.3 30100	301 55 206 1.5 30200	322 58 208 1.5 30200
54			102 20 202 .6 28700	207 39 204 1.1 29000	255 48 206 1.3 29100	287 53 208 1.5 29200	311 57 210 1.5 29200
56			174 33 206 1.0 27800	238 45 208 1.3 28000	276 51 210 1.5 28100	304 56 212 1.6 28200	324 59 214 1.6 28200
58			215 41 210 1.2 26900	262 49 212 1.5 27000	294 55 214 1.6 27100	320 59 216 1.7 27200	339 62 218 1.8 27200
60			244 46 214 1.4 26000	283 53 216 1.6 26100	311 58 218 1.7 26100	334 61 220 1.8 26200	353 64 222 1.9 26300
62			176 33 218 1.0 25400	220 41 220 1.2 25400	240 44 222 1.3 25400	267 48 224 1.4 25400	302 54 226 1.6 25400
64			117 21 222 .7 25200	149 27 224 .8 25200	175 31 226 .9 25300	197 35 228 1.0 25300	216 37 230 1.1 25300
66			98 18 226 .6 25100	126 22 228 .7 25100	149 26 230 .8 25100	169 29 232 .9 25100	187 32 234 .9 25100
68	26 5 226 .2 24900	94 17 230 .5 25000	120 21 232 .7 25000	141 24 234 .8 25000	153 26 236 .8 25000	170 28 238 .8 25000	185 30 240 .9 25000
70	119 21 230 .8 24500	182 32 234 1.2 24600	205 36 236 1.3 24600	222 39 238 1.3 24700	238 41 240 1.4 24700	253 43 242 1.4 24700	
72	153 27 234 1.1 23900	214 38 238 1.4 24000	234 41 240 1.5 24100	252 44 242 1.6 24100	268 46 244 1.6 24100	284 48 246 1.7 24100	
74	178 32 238 1.3 23400	232 41 242 1.6 23500	253 44 244 1.7 23500	270 47 246 1.7 23500	286 49 248 1.8 23500	300 51 250 1.8 23500	
76	196 35 242 1.4 22800	246 43 246 1.7 22900	264 46 248 1.8 22900	280 48 250 1.8 22900	295 50 252 1.9 23000	311 52 254 1.9 23000	
78	209 37 246 1.6 22300	256 44 250 1.8 22300	274 47 252 1.9 22300	291 50 254 1.9 22400	306 52 256 2.0 22400		
CORRECTIONS		DISTANCE		TIME	FUEL	LEVEL OFF	
ENGINE ANTI ICE ON		+ 3 %		+ 3 %	+ 7 %	- 100 FT	
TOTAL ANTI ICE ON		+ 8 %		+ 8 %	+ 10 %	- 700 FT 3	

ONE ENGINE OUT

R

LONG RANGE CRUISE - 1 ENGINE OUT						
MAX. CONTINUOUS THRUST LIMITS PACK FLOW HI ANTI-ICING OFF			ISA CG=33.0%	N1 (%) FUEL FLOW (KG/H)	MACH IAS (KT)	
WEIGHT (1000KG)	FL100	FL150	FL190	FL210	FL230	FL250
50	75.5 .453 1891 251	79.5 .492 1848 248	82.2 .520 1802 242	83.3 .533 1778 238	84.7 .549 1771 236	85.8 .560 1750 231
52	76.7 .463 1967 256	80.5 .500 1915 252	82.9 .524 1856 244	84.3 .541 1851 242	85.5 .554 1833 238	86.7 .567 1825 234
54	77.8 .471 2041 261	81.4 .507 1983 255	83.8 .532 1925 248	85.2 .548 1920 246	86.2 .558 1896 240	87.4 .568 1880 235
56	78.9 .479 2112 265	82.4 .514 2049 259	84.6 .539 1996 251	85.9 .553 1983 248	87.0 .565 1969 243	88.4 .577 1975 238
58	79.7 .485 2175 268	83.1 .519 2107 261	85.5 .546 2068 255	86.5 .557 2045 250	87.7 .569 2035 245	89.5 .586 2075 242
60	80.4 .490 2233 271	83.7 .522 2160 263	86.2 .551 2132 257	87.2 .562 2112 252	88.4 .571 2100 246	90.6 .595 2178 246
62	81.1 .495 2292 274	84.3 .527 2219 266	86.8 .555 2194 259	88.0 .569 2190 255	89.6 .583 2211 251	92.1 .610 2302 253
64	82.0 .502 2363 278	85.0 .533 2289 269	87.4 .559 2258 261	88.6 .570 2247 256	90.5 .590 2306 254	92.4 .601 2323 249
66	82.8 .508 2431 281	85.8 .539 2361 272	88.1 .564 2330 264	89.4 .575 2327 258	91.5 .599 2413 258	92.6 .582 2315 241
68	83.6 .514 2499 284	86.5 .545 2434 275	88.8 .570 2406 266	90.3 .584 2434 263	92.7 .609 2523 263	
70	84.3 .519 2563 287	87.2 .550 2503 278	89.3 .571 2463 267	91.2 .591 2529 266	93.1 .601 2547 260	
72	84.8 .522 2619 289	87.7 .554 2566 280	90.0 .576 2546 269	92.2 .599 2638 269	93.3 .585 2543 252	
74	85.3 .524 2672 291	88.2 .557 2628 281	91.0 .585 2657 274	93.3 .609 2752 274	93.5 .554 2524 238	
76	85.8 .528 2731 293	88.8 .561 2695 283	91.8 .591 2754 277	93.6 .603 2778 271		
78	86.4 .533 2802 295	89.3 .565 2766 286	92.6 .598 2861 280	93.9 .591 2784 265		
ENGINE ANTI ICE ON △FUEL = + 3.5 %				TOTAL ANTI ICE ON △FUEL = + 7 %		

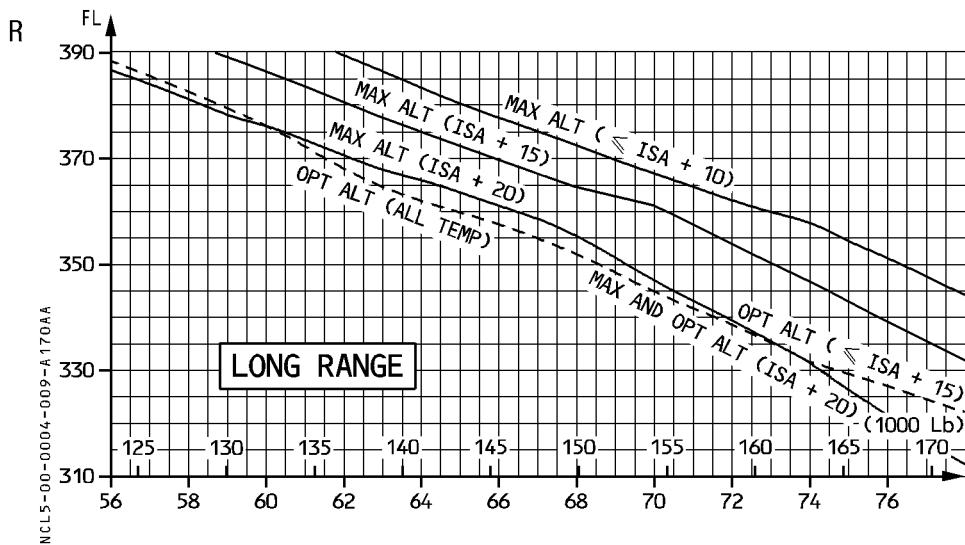
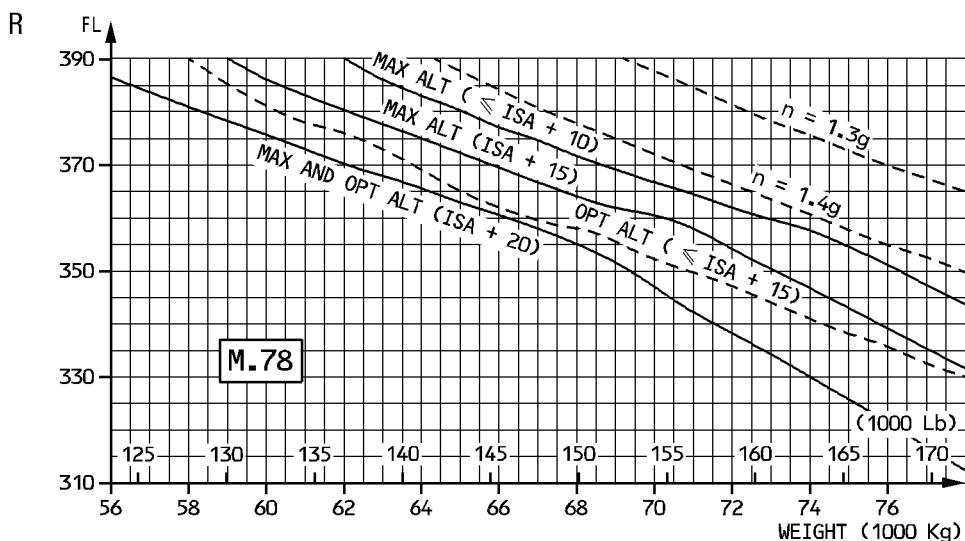
ONE ENGINE OUT

R 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)

AIR DIST. (NM)	FLIGHT LEVEL						CORRECTION ON FUEL CONSUMPTION (KG/1000KG)		
	100	150	200	220	240	250	FL100	FL200	FL240
	FL150	FL220	FL250	FL250	FL250	FL250	FL250	FL250	FL250
200	1379 0.46	1188 0.44	1061 0.42	1017 0.42	978 0.41	961 0.41	9	7	8
300	2055 1.06	1811 1.03	1641 1.01	1583 1.00	1533 0.59	1511 0.59	15	14	17
400	2727 1.26	2430 1.22	2217 1.19	2146 1.18	2085 1.17	2058 1.17	21	21	24
500	3394 1.46	3046 1.41	2790 1.37	2705 1.35	2632 1.34	2601 1.34	27	27	32
600	4058 2.06	3658 2.00	3359 1.55	3260 1.53	3175 1.52	3140 1.52	32	34	40
700	4718 2.27	4266 2.20	3924 2.14	3812 2.11	3713 2.10	3676 2.09	38	40	47
800	5373 2.48	4870 2.39	4485 2.32	4360 2.29	4248 2.28	4207 2.27	44	46	54
900	6024 3.09	5471 2.59	5042 2.51	4904 2.47	4780 2.46	4734 2.45	50	53	60
1000	6672 3.29	6067 3.18	5596 3.10	5445 3.06	5307 3.04	5257 3.02	56	59	67
1100	7315 3.51	6661 3.38	6146 3.28	5982 3.24	5831 3.22	5777 3.20	62	65	74
1200	7955 4.12	7251 3.58	6693 3.47	6516 3.42	6352 3.40	6293 3.38	68	71	80
1300	8590 4.33	7837 4.17	7237 4.06	7047 4.00	6869 3.58	6806 3.55	73	77	86
1400	9222 4.55	8421 4.37	7777 4.25	7574 4.19	7382 4.16	7315 4.13	79	83	93
ENGINE ANTI ICE ON Δ FUEL = + 2.5 %						TOTAL ANTI ICE ON Δ FUEL = + 5 %			



ALL ENG MAX/OPT ALTITUDES



CORRECTIONS	ENGINE ANTI ICE	TOTAL ANTI ICE
ISA	Max Alt.: - 200 FT Opt Alt. : - 200 FT	Max Alt.: - 500 FT Opt Alt. : - 300 FT
ISA + 10	Max Alt.: - 1500 FT Opt Alt. : - 400 FT	Max Alt.: - 4200 FT Opt Alt. : - 3100 FT
ISA + 15	Max Alt.: - 3500 FT Opt Alt. : - 3500 FT	Max Alt.: - 4800 FT Opt Alt. : - 4300 FT
ISA + 20	Max Alt.: - 5300 FT Opt Alt. : - 3800 FT	Max Alt.: - 6500 FT Opt Alt. : - 6200 FT

ALL ENGINES

R IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING									
CRUISE : M.78 - DESCENT : M.78/300KT/250KT - IMC PROCEDURE : 120 KG (6MIN)						TIME (H.MIN)			
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)		
	290	310	330	350	370	390	FL290 FL310	FL330 FL350	FL370 FL390
200	974 0.35	915 0.35	863 0.36	818 0.36	782 0.36	758 0.36	0	1	4
400	2147 1.01	2023 1.02	1913 1.02	1822 1.02	1756 1.03	1727 1.03	5	9	16
600	3315 1.27	3124 1.28	2957 1.28	2818 1.29	2720 1.29	2682 1.29	10	16	33
800	4477 1.53	4218 1.54	3993 1.55	3806 1.56	3674 1.56	3622 1.56	15	23	45
1000	5634 2.19	5306 2.20	5023 2.21	4787 2.22	4617 2.23	4549 2.23	20	30	56
1200	6786 2.45	6387 2.46	6045 2.48	5759 2.49	5551 2.50	5463 2.50	24	37	67
1400	7933 3.11	7464 3.13	7062 3.14	6724 3.16	6475 3.17	6365 3.17	29	43	77
1600	9076 3.37	8537 3.39	8075 3.41	7683 3.42	7392 3.43	7256 3.43	33	49	86
1800	10214 4.03	9604 4.05	9081 4.07	8636 4.09	8302 4.10	8135 4.10	37	54	95
2000	11347 4.29	10665 4.31	10083 4.33	9582 4.36	9203 4.37	9004 4.37	41	60	103
2200	12475 4.55	11721 4.57	11078 5.00	10521 5.02	10098 5.04	9863 5.04	45	65	111
2400	13599 5.21	12775 5.23	12068 5.26	11454 5.29	10984 5.31	10711 5.31	49	70	118
2600	14718 5.47	13824 5.50	13052 5.53	12382 5.56	11863 5.57	11550 5.57	52	74	125
2800	15833 6.13	14869 6.16	14030 6.19	13305 6.22	12739 6.24	12382 6.24	55	79	131
3000	16944 6.39	15909 6.42	15002 6.45	14222 6.49	13608 6.51	13211 6.51	58	83	137
LOW AIR CONDITIONING Δ FUEL = - 0.5 %				ENGINE ANTI ICE ON Δ FUEL = + 3 %			TOTAL ANTI ICE ON Δ FUEL + + 6 %		

FLIP23D A320-214 CFM56-5B4/P SA3610 03301.000011 0250300 .7800 .00200 120 0300350 60 0 100 20 20 20 18590 CL-NO-04-10-170

**COST INDEX**

For a quick determination of the CILRC, use :

- CILRC = 25 kg/min in the FMGC
- or
- CILRC = 35 (100 lb/h) in the FMGC.

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				IAS (KT)
FL	TIME (MIN)	FUEL (KG)	DIST. (NM)	N1	TIME (MIN)	FUEL (KG)	DIST. (NM)	N1	
390	16.1	204	101	68.8	17.4	165	106	IDLE	241
370	14.6	174	89	69.9	16.7	160	100	IDLE	252
350	12.9	134	77	72.1	16.0	156	95	IDLE	264
330	12.0	119	70	IDLE	15.4	153	91	IDLE	277
310	11.6	117	67	IDLE	14.8	149	86	IDLE	289
290	11.1	114	64	IDLE	14.2	145	82	IDLE	300
270	10.6	110	59	IDLE	13.4	141	76	IDLE	300
250	10.0	107	55	IDLE	12.7	136	71	IDLE	300
240	9.7	105	53	IDLE	12.3	133	68	IDLE	300
220	9.1	100	49	IDLE	11.5	127	62	IDLE	300
200	8.5	94	45	IDLE	10.6	119	56	IDLE	300
180	7.8	86	40	IDLE	9.8	109	51	IDLE	300
160	7.1	78	36	IDLE	8.8	97	45	IDLE	300
140	6.3	67	31	IDLE	7.9	83	39	IDLE	300
120	5.6	57	27	IDLE	6.9	70	33	IDLE	300
100	4.9	48	23	IDLE	6.0	58	28	IDLE	300
50	1.7	15	7	IDLE	2.1	18	9	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		-		+ 6 %		+ 6 %		-	
FUEL		- 2 %		+ 28 %		+ 44 %		+ 0.2 %	
DISTANCE		-		+ 3 %		+ 4 %		+ 0.3 %	

11.0-08F0A320-214 CFM56-5B4/P SA23100000C5KG330 0 018590 0 0-1-350.0 15.0 .00 0 03 .780300.000250.000 0

FCOM-N0-03-05-30-002-170

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 CG = 33.0 %		FUEL CONSUMED (KG)				
NORMAL AIR CONDITIONING					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	522 0.12						2		
60	677 0.16	663 0.16					3		
80	831 0.19	801 0.19					5		
100	986 0.23	940 0.23	937 0.22				6	6	
120	1141 0.27	1078 0.26	1061 0.26	1073 0.25			7	7	
140	1296 0.31	1217 0.30	1186 0.29	1187 0.28			8	8	
160	1451 0.35	1356 0.33	1310 0.33	1301 0.31	1312 0.30		9	9	10
180	1607 0.38	1495 0.37	1435 0.36	1415 0.34	1417 0.33	1429 0.33	10	10	11
200	1762 0.42	1634 0.40	1559 0.40	1529 0.38	1523 0.36	1528 0.36	11	11	13
220	1918 0.46	1774 0.44	1684 0.43	1644 0.41	1629 0.39	1628 0.38	12	12	14
240	2074 0.50	1913 0.47	1809 0.47	1758 0.44	1735 0.42	1727 0.41	13	13	15
260	2231 0.53	2053 0.51	1934 0.50	1872 0.47	1841 0.45	1827 0.44	14	14	16
280	2387 0.57	2193 0.54	2060 0.53	1987 0.50	1948 0.48	1927 0.47	15	15	17
300	2544 1.01	2332 0.58	2185 0.57	2102 0.53	2054 0.51	2027 0.50	16	16	18
320	2700 1.04	2473 1.01	2310 1.00	2217 0.57	2161 0.54	2127 0.53	17	17	19
340	2857 1.08	2613 1.05	2436 1.04	2332 1.00	2267 0.57	2227 0.56	18	18	20
360	3014 1.12	2753 1.08	2562 1.07	2447 1.03	2374 1.00	2327 0.58	19	20	21
380	3170 1.16	2893 1.12	2688 1.11	2562 1.06	2481 1.03	2427 1.01	20	21	22
400	3328 1.19	3033 1.15	2814 1.14	2678 1.09	2587 1.06	2528 1.04	21	22	23
420	3485 1.23	3174 1.19	2940 1.18	2793 1.12	2694 1.09	2628 1.07	22	23	24
440	3642 1.27	3314 1.22	3066 1.21	2909 1.15	2802 1.12	2729 1.10	23	24	25
460	3800 1.30	3455 1.26	3192 1.24	3024 1.19	2909 1.15	2830 1.13	24	25	26
480	3957 1.34	3595 1.29	3319 1.28	3140 1.22	3016 1.18	2930 1.16	25	26	27
500	4115 1.38	3736 1.33	3446 1.31	3256 1.25	3123 1.21	3031 1.18	26	27	28
LOW AIR CONDITIONING			ENGINE ANTI ICE ON			TOTAL ANTI ICE ON			
Δ FUEL = - 1 %			Δ FUEL = + 5 %			Δ FUEL = + 7 %			

FLIGHT WITHOUT CAB PRESS

R

IN CRUISE QUICK CHECK FROM ANY MOMENT IN CRUISE TO LANDING

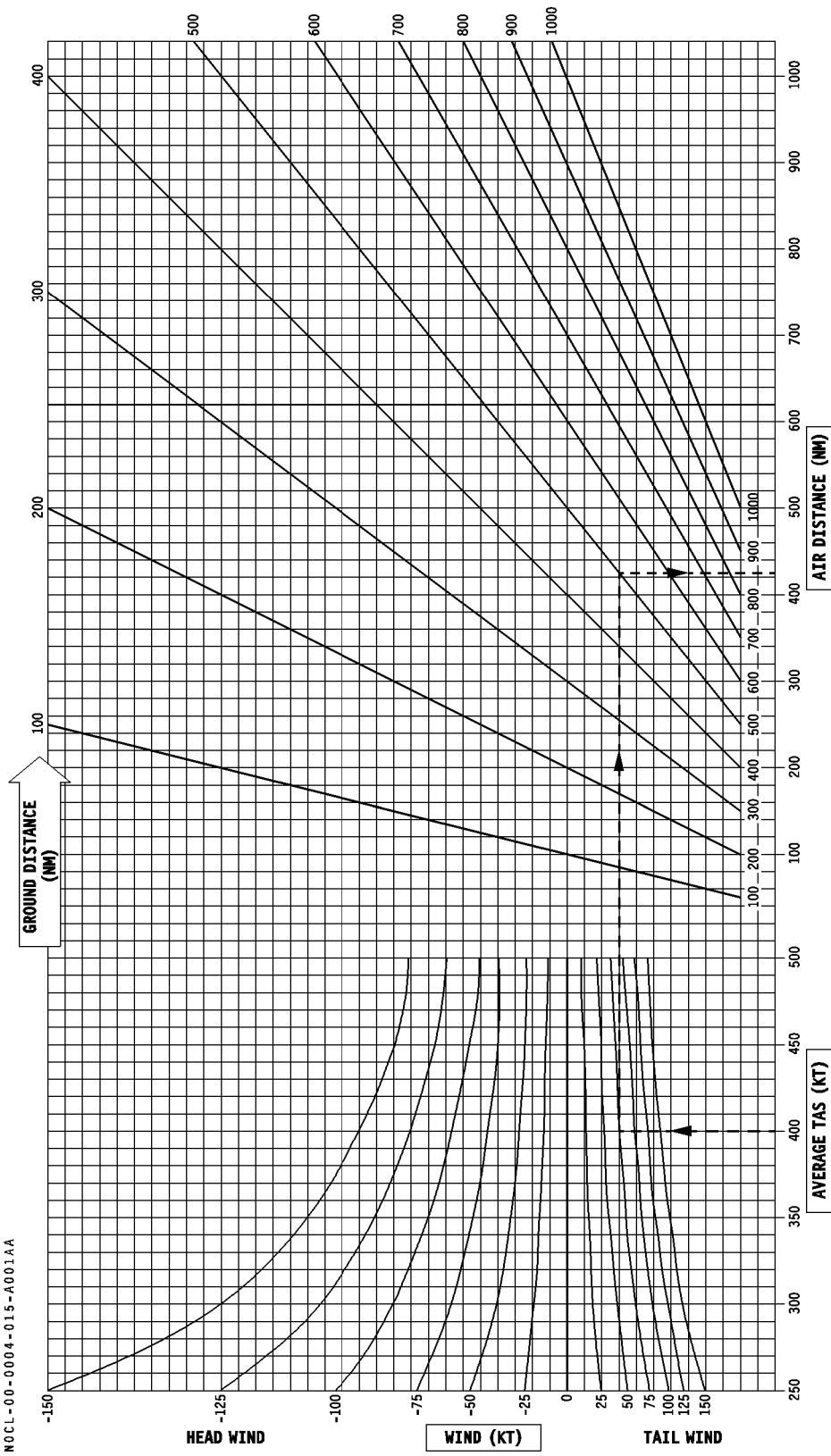
CRUISE : LONG RANGE - DESCENT : 250KT

IMC PROCEDURE : 120 KG (6MIN)

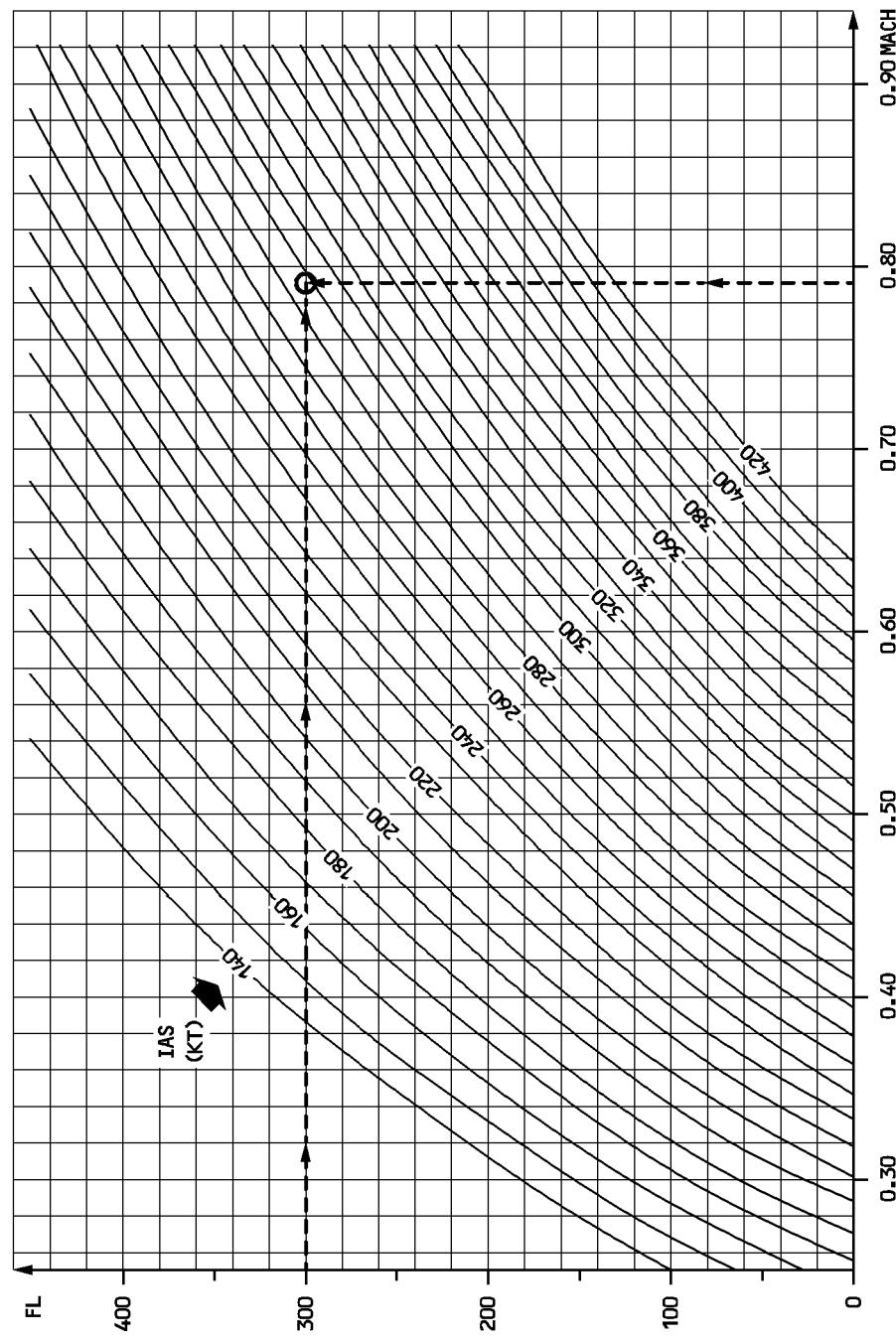
FL100

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	312 0.15	310 0.15	309 0.15	310 0.15	311 0.15	314 0.15	318 0.15
60	458 0.19	463 0.19	467 0.18	472 0.18	478 0.18	485 0.18	493 0.18
80	604 0.23	616 0.22	625 0.22	634 0.22	644 0.22	655 0.21	667 0.21
100	750 0.28	768 0.26	783 0.26	797 0.25	811 0.25	825 0.25	841 0.25
120	896 0.32	921 0.30	940 0.29	959 0.29	977 0.28	995 0.28	1015 0.28
140	1041 0.36	1073 0.34	1098 0.33	1121 0.32	1143 0.32	1165 0.32	1189 0.32
160	1186 0.41	1225 0.38	1255 0.37	1283 0.36	1309 0.35	1335 0.35	1363 0.35
180	1331 0.45	1377 0.42	1413 0.40	1444 0.39	1475 0.39	1504 0.38	1537 0.38
200	1476 0.50	1529 0.46	1570 0.44	1606 0.43	1640 0.42	1674 0.42	1710 0.42
220	1621 0.54	1680 0.50	1727 0.48	1767 0.46	1806 0.46	1843 0.45	1883 0.45
240	1765 0.58	1831 0.54	1884 0.51	1928 0.50	1971 0.49	2012 0.49	2056 0.48
260	1910 1.03	1982 0.58	2040 0.55	2090 0.54	2136 0.52	2181 0.52	2229 0.52
280	2054 1.07	2133 1.02	2197 0.59	2251 0.57	2302 0.56	2350 0.55	2402 0.55
300	2198 1.11	2284 1.06	2353 1.03	2411 1.01	2467 0.99	2519 0.99	2575 0.99
320	2341 1.16	2434 1.10	2510 1.06	2572 1.04	2632 1.03	2687 1.02	2748 1.02
340	2485 1.20	2585 1.14	2666 1.10	2733 1.08	2796 1.06	2856 1.06	2920 1.05
360	2628 1.25	2735 1.19	2822 1.14	2893 1.11	2961 1.10	3024 1.09	3093 1.09
380	2771 1.29	2885 1.23	2978 1.17	3053 1.15	3125 1.13	3193 1.12	3265 1.12
400	2914 1.33	3034 1.27	3133 1.21	3213 1.18	3290 1.17	3361 1.16	3437 1.15
420	3057 1.38	3184 1.31	3289 1.25	3373 1.22	3454 1.20	3529 1.19	3609 1.19
440	3199 1.42	3333 1.35	3444 1.29	3533 1.26	3618 1.23	3697 1.22	3780 1.22
460	3342 1.47	3482 1.40	3600 1.32	3693 1.29	3782 1.27	3865 1.26	3952 1.26
480	3484 1.51	3631 1.44	3755 1.36	3852 1.33	3946 1.30	4033 1.29	4124 1.29
500	3626 1.56	3780 1.48	3910 1.40	4012 1.36	4110 1.34	4200 1.33	4295 1.32
520	3768 2.00	3928 1.52	4065 1.44	4171 1.40	4273 1.37	4368 1.36	4466 1.36
540	3909 2.05	4077 1.57	4219 1.47	4330 1.44	4437 1.41	4535 1.39	4637 1.39
AIR CONDITIONING OFF △FUEL = - 2.5 %		ENGINE ANTI ICE ON △FUEL = + 5 %		TOTAL ANTI ICE ON △FUEL = + 9 %			

GROUND DISTANCE - AIR DISTANCE CONVERSION



IAS – MACH CONVERSION



NCL5-00-0004-016-A001AA

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HYD ARCHITECTURE	5.02
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REQUIRED EQUIPMENT FOR CAT2 AND CAT3	5.04

R

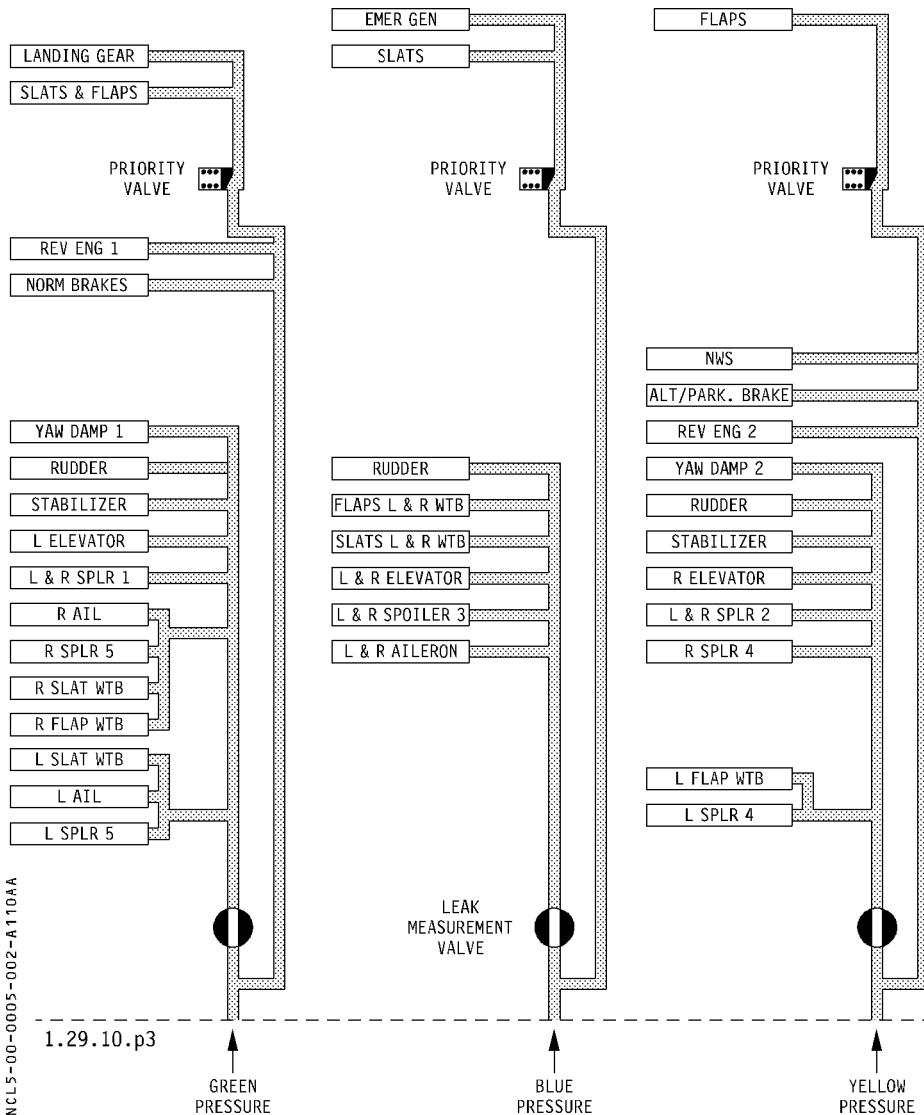
SEVERE TURBULENCE

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
		N 1 %								
390	0.76	80.0	81.0	82.0	83.1	—	—	—	—	—
370	0.76	79.1	79.8	80.7	81.6	82.6	83.6	—	—	—
350	0.76	78.8	79.3	80.0	80.7	81.5	82.4	83.3	84.3	—
330	0.76	78.8	79.3	79.8	80.4	81.0	81.8	82.6	83.4	84.2
310	275	78.1	78.6	79.2	79.8	80.3	80.9	81.5	82.3	83.1
290	275	76.6	77.1	77.6	78.2	78.9	79.6	80.3	81.0	81.7
270	275	75.1	75.6	76.1	76.7	77.3	78.0	78.7	79.6	80.5
250	275	73.5	74.0	74.5	75.1	75.8	76.5	77.2	77.9	78.8
200	275	69.9	70.3	70.7	71.2	71.8	72.4	73.0	73.7	74.4
150	250	61.9	62.6	63.3	64.0	64.9	65.9	66.9	68.0	68.9
100	250	58.3	59.0	59.6	60.2	61.0	61.8	62.6	63.5	64.5
50	250	54.3	54.9	55.6	56.3	57.1	58.0	59.0	60.0	60.8

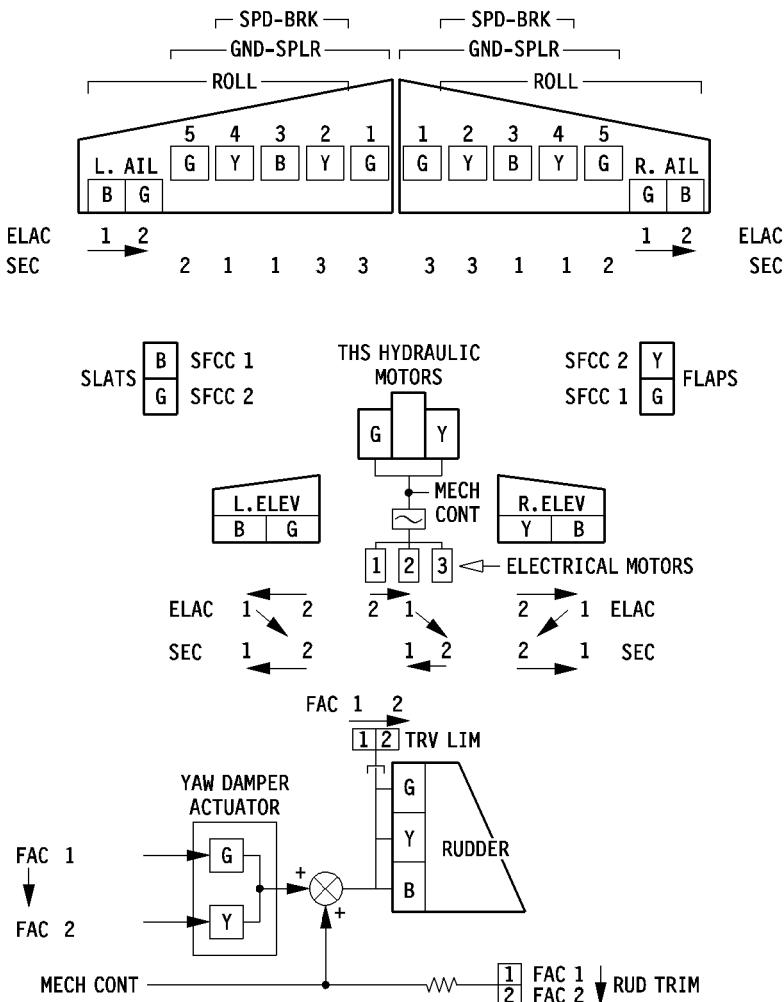
- R
- SIGNS ON
 - AUTO PILOT KEEP ON
 - A/THR (when thrust changes become excessive) . DISCONNECT
- FOR APPROACH :
- A/THR in managed speed USE

HYD ARCHITECTURE





FLT CTL ARCHITECTURE



→ Arrows indicate the control reconfiguration priorities

[G] **[B]** **[Y]** indicates the hydraulic power source for each servo control

REQUIRED EQUIPMENT FOR CAT II AND CAT III

	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
FMGS MONITORED FOR FMA LDG CAPABILITY	AP/FD	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED
	AUTOTHROST	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 DUs	2	2	2
	FLIGHT WARNING COMPUTER	1	1	2
	BSCU CHANNEL	1*	1*	1
	ANTISKID	1*	1*	1
	NOSEWHEEL STEERING	1*	1*	1
	RADIO ALTIMETER	1 (displayed on both sides)	2	2
	ILS RECEIVER	2	2	2
	BEAM EXCESSIVE DEVIATION WARNING	1 for PNF	2	2
R NOT FMGS MONITORED FOR FMA LDG CAPABILITY	ATTITUDE INDICATION (PFD1/PFD2)	N° 1 + N° 2	N° 1 + N° 2	N° 1 + N° 2
	ADR/IR	2/2	2/2	3/3
	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 DUs	1	2	2
	AUTO CALLOUT FUNCTION	one is required for autoland	1	1
	ATTITUDE INDICATION (STBY)	1	1	1
	DH INDICATION	1 for PNF		

* 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.

REQUIRED EQUIPMENT FOR CAT II AND CAT III

R	FMA CAPABILITY →	CAT 2	CAT 3 SINGLE	CAT 3 DUAL
	EQUIPMENT ↓			
	AP	1 AP ENGAGED	1 AP ENGAGED	2 AP ENGAGED



NO CHANGE



318/319/320/321 QUICK REFERENCE HANDBOOK
LIST OF EFFECTIVE OEBs

M	OEB PROC NO	TYP	AFFECTS	ECAM	--DATE--	-----TITLE-----	-----EFFECTIVITY-----
	078-1A	R ALL		N	FEB2008	BRAKING MISBEHAVIOUR	
	178-1A	R ALL		N	FEB2008	OPERATION OF CTR TK PUMPS	
	101-1A	W ALL		N	FEB2008	NOSE LANDING GEAR	
	149-1A	W ALL		Y	FEB2008	DUAL BLEED LOSS	
	162-1A	W ALL		N	FEB2008	INCORRECT MORA VALUE	
	169-1A	W ALL		N	FEB2008	DUAL FM RESET WITH FIX INF	
	188-1A	W ALL		N	FEB2008	NO SRS DURING GA BELOW MDA	
	189-1A	W ALL		N	MAR2008	RNAV INCORRECT FLIGHT PATH	

BRAKING MISBEHAVIOURS

AFFECTED ECAM : NONE

PROCEDURE :

A – UNCOMMANDED BRAKING :

1. AT TAKE OFF BEFORE POWER SET :

- Check hydraulic pressure on the yellow triple indicator :
- IF RESIDUAL PRESSURE IS INDICATED :
 - Depress several times the brake pedals until release of residual pressure
 - If residual pressure remains, the take off must be cancelled and the valve has to be changed.

2. DURING FLIGHT :

- Avoid any action on brake pedals

3. DURING APPROACH AFTER LANDING GEAR EXTENSION :

- Check hydraulic pressure on the yellow triple indicator

● IF RESIDUAL PRESSURE IS INDICATED :

- Depress several times the brake pedals until release of residual pressure
- If residual pressure remains, apply brakes at touchdown. A slight brake deflection (3°) will supersede any previous yellow pressure.

Note : If antiskid is inoperative maintain a symmetrical braking as soon as the aircraft touches the ground.

B – BRAKING ON YELLOW SYSTEM :

If asymmetric braking is experienced :

- modulate braking as appropriate.

*** END OF OEB PROC N° 078 ***

OPERATION OF CENTER TANK PUMPS

AFFECTED ECAM : NONE

PROCEDURES :

The flight crew should perform PROCEDURE A, as indicated below. However, the flight crew may apply PROCEDURE B instead, only if maintenance and/or engineering personnel confirm(s) that this aircraft has :

- Center tank pumps with P/N 568-1-27202-05R or 568-1-27202-02R, or
- Center tank pumps manufactured by Intertechnique (P/N P99C38-601 or P99C38-605), or
- The center tank deactivated, and kept empty for the entire flight, in accordance with AMM center tank deactivation procedure (Chapter 28-21-00 P. Block 401).

PROCEDURE A

FUEL LOADING

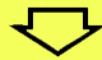
Refueling

Before refueling, all fuel pumps must be turned OFF, in order to prevent them from automatically starting during the refueling process.

- If the total Fuel On Board (FOB) after refueling is below or equal to 12 000 kg (26 500 lb), or above 15 000 kg (33 000 lb), automatic refueling process can be followed.
- If the total FOB after refueling is between 12 000 kg (26 500 lb) and 15 000 kg (33 000 lb), manual refueling is necessary.
 - 2 000 kg (4 500 lb) of fuel must be put in the center tank
 - The remaining quantity should be shared between the wing tanks
 - If the wing tanks are full, put the remainder of the fuel in the center tank.

After fuel distribution, the wing tanks may not be full when there is fuel in the center tank. This is acceptable for the flight.

If the fuel quantity in the center tank is below 2 000 kg (4 500 lb), the fuel must be considered unusable, and the center tank pumps must be turned OFF for the entire flight.



OPERATION OF CENTER TANK PUMPS (cont'd)

PROCEDURE A (CONT'D)

If the total FOB after refueling is above 12 000 kg (26 500 lb), then the takeoff Center of Gravity (CG) must be determined using the revised fuel index data, and checked within the revised operational takeoff CG envelope, as explained in the Airbus Flight Operations Telex (FOT) reference STL 999.0047/06 Revision 1. If the revised fuel index data and the revised operational envelope are not used, the following table shall be used to check the takeoff CG :

	Move the forward limit of the operational takeoff CG envelope by	Move the takeoff CG by
FOB \leq 12 000 kg (26 500 lb)	No change	No change
12 000 kg (26 500 lb) $<$ FOB \leq 15 000 kg (33 000 lb)	2% MAC aft, for A318 & A320 1% MAC aft, for A319 No change for A319CJ	2% MAC forward, for all aircraft
FOB $>$ 15 000 kg (33 000 lb)	2% MAC aft, for A318 & A320 1% MAC aft, for A319 No change for A319CJ	No change

Ground Fuel Transfer

Do not start a fuel transfer from the center tank, if it contains less than 2 000 kg (4 500 lb) of fuel. Do not start a fuel transfer from an inner cell of a wing tank, if it contains less than 700 kg (1 550 lb) of fuel. If a tank has less than the required quantity, it is necessary to add fuel (via a transfer from another tank or refueling) to enable a transfer to take place.

Defueling

When performing a pressure defueling of the center tank, make sure that the center tank contains at least 2 000 kg (4 500 lb) of fuel. If it has less than the required quantity, then transfer fuel to the center tank. Defuel the aircraft normally, and immediately turn OFF both center tank pumps after the FAULT light on the corresponding pushbutton-switch comes on.

When defueling the wing tanks, do not start the fuel pumps if the fuel quantity in the inner cell is below 700 kg (1 550 lb). If the fuel on the aircraft is not sufficient to achieve the required fuel distribution, then transfer fuel or refuel the aircraft to obtain the required fuel quantity in the wing tank.



OPERATION OF CENTER TANK PUMPS (cont'd)

PROCEDURE A (CONT'D)

CENTER TANK PUMPS OPERATION

WARNING

Do not turn on the center tank pumps, if the center tank contains less than 2 000 kg (4 500 lb) of fuel, even if it is requested by another procedure.

Before and during refueling :

- ALL TK PUMPS OFF
- IF THE TOTAL FOB AFTER REFUELING IS LESS THAN OR EQUAL TO 12 000 KG (26 500 LB)**

After refueling :

- CTR TK CHECK EMPTY
If fuel remains in the center tank, it must be considered unusable.
- L and R TK PUMP 1 and 2 ON
- CTR TK PUMP 1 and 2 MAINTAIN OFF
- FUEL MODE SEL MAN



OPERATION OF CENTER TANK PUMPS (cont'd)

PROCEDURE A (CONT'D)

**■ IF THE TOTAL FOB AFTER REFUELING IS MORE THAN
12 000 KG (26 500 LB)****After refueling :**

- CTR TK QUANTITY CHECK
Check that the center tank contains at least 2 000 kg (4 500 lb) of fuel.

**■ CASE 1 : If the fuel quantity in the center tank is between
2 000 kg (4 500 lb) and 3 000 kg (6 500 lb) :****After refueling :**

- L and R TK PUMP 1 and 2 ON
- CTR TK PUMP 1 and 2 MAINTAIN OFF
- FUEL MODE SEL MAN

In flight :

- When **FUEL AUTO FEED FAULT** caution triggers, or the fuel quantity in one wing tank (inner + outer) is below 5 000 kg (11 000 lb) :

- CTR TK PUMP 1 and 2 ON

- If **FUEL CTR TK PUMP 1(2) LO PR** caution triggers :

- CTR TK PUMP 1(2) OFF

CAUTION

Turn OFF the associated CTR TK PUMP without delay.

- If no fuel leak :

- FUEL X FEED ON

- When **FUEL CTR TK PUMPS LO PR** caution triggers, or when the center tank is empty :

- CTR TK PUMP 1 and 2 OFF

- FUEL X FEED OFF

CAUTION

Turn OFF both CTR TK PUMPS without delay.



OPERATION OF CENTER TANK PUMPS (cont'd)

PROCEDURE A (CONT'D)

- CASE 2 : If the fuel quantity in the center tank is above 3 000 kg (6 500 lb) :

After refueling :

- ALL TK PUMPS ON
- FUEL MODE SEL CHECK AUTO

The flight crew should note on the computerized flight plan the estimated position or time when the center tank fuel quantity will drop below 3 000 kg (6 500 lb).

In flight :

- CTR TK QUANTITY MONITOR

- When the fuel quantity in the center tank is between 2 000 kg (4 500 lb) and 3 000 kg (6 500 lb) :

- FUEL MODE SEL MAN
- CTR TK PUMP 1 and 2 OFF

Note : If the fuel quantity in the center tank inadvertently goes below 2 000 kg (4 500 lb) prior to being checked, and the CTR TK PUMPS have not been turned OFF, the flight crew must perform the following steps :

- If the fuel in the center tank is required for the flight :
Maintain the CTR TK PUMPS in the ON position. Set the FUEL MODE SEL to MAN. When FUEL CTR TK PUMP 1 or PUMP 2 or PUMPS LO PR is triggered on the ECAM, or when the center tank is empty, turn OFF both CTR TK PUMPS without delay. Do not apply the subsequent procedures.
- If the fuel in the center tank is not required for the flight :
Turn OFF both CTR TK PUMPS and do not turn them back on for the remainder of the flight. Consider the center tank fuel as unusable. Do not apply the subsequent procedures.

- When FUEL AUTO FEED FAULT caution triggers, or the fuel quantity in one wing tank (inner + outer) is below 5 000 kg (11 000 lb) :

- CTR TK PUMP 1 and 2 ON

- If FUEL CTR TK PUMP 1(2) LO PR caution triggers :

- CTR TK PUMP 1(2) OFF

— CAUTION —

Turn OFF the associated CTR TK PUMP without delay.

- If no fuel leak :

- FUEL X FEED ON

- When FUEL CTR TK PUMPS LO PR caution triggers, or when the center tank is empty :

- CTR TK PUMP 1 and 2 OFF
- FUEL X FEED OFF

— CAUTION —

Turn OFF both CTR TK PUMPS without delay.



OPERATION OF CENTER TANK PUMPS (cont'd)

PROCEDURE B

Apply PROCEDURE B instead of PROCEDURE A, only if maintenance/engineering personnel confirm(s) that this aircraft has :

- Center tank pumps with P/N ending in -05R or -02R, or
- Center tank pumps manufactured by Intertechnique, or
- The center tank deactivated, and kept empty for the entire flight.

FUEL LOADING

Refueling

Before refueling, all wing tank pumps must be turned OFF.

Ground Fuel Transfer

Do not start a fuel transfer from an inner cell of a wing tank, if it contains less than 700 kg (1 550 lb) of fuel. If a tank has less than the required quantity, it is necessary to add fuel (via a transfer from another tank or refueling) to enable a transfer to take place.

Defueling

When defueling the wing tanks, do not start the fuel pumps if the fuel quantity in the inner cell is below 700 kg (1 550 lb). If the fuel on the aircraft is not sufficient to achieve the required fuel distribution, then transfer fuel or refuel the aircraft to obtain the required fuel quantity in the wing tank.

*** END OF OEB PROC N° 178 ***

NOSE LANDING GEAR

AFFECTED ECAM : NONE

PROCEDURE :

If unable to retract the landing gear after takeoff, make a second attempt approximately one minute later (maximum time to achieve complete extension of the shock absorber).

***** END OF OEB PROC N° 101 *****

ENGINE BLEED FAILURE LEADING TO PROBABLE DUAL BLEED LOSS

AFFECTED ECAM : AIR ENG 1(2) BLEED ABNORM PR
AIR ENG 1(2) BLEED FAULT
AIR ENG 1(2) BLEED LO TEMP

PROCEDURE :

If one of the following three warnings is triggered, the associated procedures may help avoid the loss of both bleeds.

AIR ENG 1(2) BLEED ABNORMAL PR

- **If wing anti-ice is ON, and both packs are on :**
 - PACK (on the affected bleed side) OFF
One pack must be switched OFF, when the pilot is using wing anti-ice, due to precooler performance.
 - X BLEED OPEN
- **If the precooler outlet temperature of the remaining bleed exceeds 240°C within 2 minutes after the crossbleed valve opening :**
This indicates that an undetected failure affects the remaining bleed.
 - X BLEED SHUT
 - WING ANTI-ICE OFF**AVOID ICING CONDITIONS**

STATUS :

The status displayed on the ECAM is correct, unless the precooler outlet temperature exceeds 240°C. If the precooler outlet temperature exceeds 240°C, the applicable status is as follows :

AVOID ICING CONDITIONS.

Note : If in icing conditions, and if the aircraft's altitude permits, consider switching OFF the remaining pack, reopening the crossbleed valve, and turning ON the wing anti-ice system.



ENGINE BLEED FAILURE LEADING TO PROBABLE
DUAL BLEED LOSS (cont'd)

AIR ENG 1(2) BLEED ABNORMAL PR (Cont'd)

■ If wing anti-ice is off, and both packs are on :

- X BLEED OPEN
- PACK FLOW LO (A319/A320)
ECON (A321)
- AFT CRG HOT AIR (if installed) OFF

● If the precooler outlet temperature of the remaining bleed exceeds 240°C within 2 minutes after the crossbleed valve opening :

This indicates that an undetected failure affects the opposite side.

- PACK (on the first affected bleed side) OFF
The remaining pack automatically delivers high flow.

STATUS :

The status displayed on the ECAM is correct.

Note : If the precooler outlet temperature exceeds 240°C, if in icing conditions and if the aircraft's altitude permits, consider switching OFF the remaining pack, reopening the crossbleed valve, and turning ON the wing anti-ice system.



ENGINE BLEED FAILURE LEADING TO PROBABLE DUAL BLEED LOSS (cont'd)**AIR ENG 1(2) BLEED FAULT**

- ENG BLEED affected (if not automatically closed) OFF
 - With the ENG BLEED pushbutton on, the FAULT light remains on.
 - With the ENG BLEED pushbutton OFF, the FAULT light goes off, when the failure (overheat or overpressure) disappears.
- **If wing anti-ice is on, and both packs are on :**
 - PACK (on the affected bleed side) OFF
One pack must be switched OFF, when the pilot is using wing anti-ice, due to precooler performance.
 - X BLEED OPEN
- **If the precooler outlet temperature of the remaining bleed exceeds 240°C within 2 minutes after the crossbleed valve opening :**

This indicates that an undetected failure affects the remaining bleed.

 - X BLEED SHUT
 - WING ANTI-ICE OFF

AVOID ICING CONDITIONS

STATUS :

The status displayed on the ECAM is correct, unless the precooler outlet temperature exceeds 240°C. If the precooler outlet temperature exceeds 240°C, the applicable status is as follows :

AVOID ICING CONDITIONS.

Note : *If in icing conditions, and if the aircraft's altitude permits, consider switching OFF the remaining pack, reopening the crossbleed valve, and turning ON the wing anti-ice system.*



ENGINE BLEED FAILURE LEADING TO PROBABLE
DUAL BLEED LOSS (cont'd)**AIR ENG 1(2) BLEED FAULT (Cont'd)****■ If wing anti-ice is off, and both packs are on :**

- X BLEED OPEN
- PACK FLOW LO (A319/A320)
ECON (A321)
- AFT CRG HOT AIR (if installed) OFF

● If the precooler outlet temperature of the remaining bleed exceeds 240°C within 2 minutes after the crossbleed valve opening :

This indicates that an undetected failure affects the opposite side.

- PACK (on the first affected bleed side) OFF
The remaining pack automatically delivers high flow.

STATUS :

The status displayed on the ECAM is correct.

Note : *If the precooler outlet temperature exceeds 240°C, if in icing conditions and if the aircraft's altitude permits, consider switching OFF the remaining pack, reopening the crossbleed valve, and turning ON the wing anti-ice system.*



ENGINE BLEED FAILURE LEADING TO PROBABLE DUAL BLEED LOSS (cont'd)**AIR ENG 1(2) BLEED LO TEMP**

In flight, bleed temperature is too low for correct wing de-icing.

- A/THR OFF
- THR LEVER (affected engine) ADVANCE
Thrust lever of the affected engine must be advanced with A/THR OFF. This may increase bleed temperature.

■ IF UNSUCCESSFUL, and the opposite bleed is available :

- X BLEED OPEN
- ENG BLEED (affected) OFF
- Associated PACK (if the other pack is on) OFF
One pack must be switched OFF, when the pilot is using wing anti-ice, due to precooler performance.

● If precooler outlet temperature of the remaining bleed exceeds 240°C within 2 minutes after the affected bleed is set to OFF :

This indicates that an undetected failure affects the remaining bleed.

- X BLEED SHUT
- WING ANTI-ICE OFF

AVOID ICING CONDITIONS

STATUS :

The status displayed on the ECAM is correct.

Note : If the precooler outlet temperature exceeds 240°C, if in icing conditions and if the aircraft's altitude permits, consider switching OFF the remaining pack, reopening the crossbleed valve, and turning ON the wing anti-ice system.

■ IF UNSUCCESSFUL, and the opposite bleed is unavailable :

- WING ANTI-ICE OFF

AVOID ICING CONDITIONS

STATUS :

The status displayed on the ECAM is correct.

*** END OF OEB PROC N° 149 ***

PAGE 1 OF 1

INCORRECT GRID-MORA VALUE DISPLAYED ON THE NAVIGATION DISPLAY BY THE FMS

AFFECTED ECAM : NONE

PROCEDURE :

If the aircraft latitude is South, or if the aircraft longitude is West, DISREGARD the Grid-Mora value that may be displayed on the Navigation Display.

Note : The highest and lowest elevations that may be displayed on the Navigation Display by the Peaks function of the EGPWS (if installed) are not impacted by this misbehavior, and are correctly computed.

*** END OF OEB PROC N° 162 ***

DUAL FM RESET UPON RADIAL FIX INFO ENTRY

AFFECTED ECAM : NONE

PROCEDURE :

A) 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).

B) Recovery Procedure :

If disengaged, consider reengagement of the AP/FD and ATTHR.

While the FMS is recovering, consider using RMP backup tuning for navigation.

1) 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.

2) If the F-PLN is lost :

When the FMS has automatically recovered, perform the associated procedures (ref. QRH 2.02B).

*** END OF OEB PROC N° 169 ***

PAGE 1 OF 1

NO SRS ENGAGEMENT DURING GO AROUND BELOW MDA

AFFECTED ECAM : 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 de-pressing the APPR pushbutton on the FCU.

When the flight crew de-presses the APPR pushbutton 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).

*** END OF OEB PROC N° 188 ***

ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES

AFFECTED ECAM : 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 FPLN page, if the last waypoint of the active FPLN, displayed in green, is identified as a runway (e.g. LFBO32L), 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.



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ERRONEOUS VERTICAL PROFILE DURING RNAV, LOC AND LOC B/C APPROACHES (cont'd)

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, the 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.

*** END OF OEB PROC N° 189 ***



EMERGENCY EVACUATION

- AIRCRAFT/PARKING BRK STOP/ON
- ATC (VHF 1) NOTIFY
- CABIN CREW (PA) ALERT
- ΔP (only if MAN CAB PR has been used) CHECK ZERO
If not zero, MODE SEL on MAN, V/S CTL FULL UP.
- ENG MASTERS (ALL) OFF
- FIRE Pushbuttons (ALL : ENG and APU) PUSH
- AGENTS (ENG and APU) AS RQRD

■ If Evacuation required :

- EVACUATION INITIATE

■ If Evacuation not required :

- CABIN CREW and PASSENGERS (PA) NOTIFY

**BEFORE START**

COCKPIT PREP. COMPLETED (BOTH)
 GEAR PINS and COVERS. REMOVED
 SIGNS. ON / AUTO
 ADIRS. NAV
 FUEL QUANTITY. KG.LB
 TO DATA. SET
 BARO REF. SET (BOTH)
 WINDOWS/DOORS. CLOSED (BOTH)
 BEACON. ON
 THR LEVERS. IDLE
 PARKING BRAKE. AS RQRD

AFTER START

ANTI ICE. AS RQRD
 ECAM STATUS. CHECKED
 PITCH TRIM. SET
 RUDDER TRIM. ZERO

BEFORE TAKEOFF

FLIGHT CONTROLS. CHECKED (BOTH)
 FLT INST. CHECKED (BOTH)
 BRIEFING. CONFIRMED
 FLAP SETTING. CONF ____ (BOTH)
 V1. VR. V2/FLX TEMP. (BOTH)
 ATC. SET
 ECAM MEMO. TO NO BLUE
 AUTO BRK MAX
 SIGNS ON
 CABIN READY (✉)
 SPLRS ARM
 FLAPS TO
 TO CONFIG NORM

R CABIN CREW. ADVISED
 TCAS. TA OR TA/RA
 ENG MODE SEL. AS RQRD
 PACKS. AS RQRD

AFTER TAKEOFF / CLIMB

LDG GEAR. UP
 FLAPS. RETRACTED
 PACKS. ON
 BARO REF. SET (BOTH)

APPROACH

BRIEFING. CONFIRMED
 ECAM STATUS. CHECKED
 SEAT BELTS. ON
 BARO REF. SET (BOTH)
 MDA/DH. SET (BOTH)
 ENG MODE SEL. AS RQRD

LANDING

CABIN CREW. ADVISED
 A/THR. SPEED/OFF
 ECAM MEMO. LDG NO BLUE
 LDG GEAR DN
 SIGNS ON
 CABIN READY (✉)
 SPLRS ARM
 FLAPS SET

AFTER LANDING

FLAPS. RETRACTED
 SPOILERS. DISARMED
 APU. START
 RADAR. OFF/STBY
 PREDICTIVE WINDSHEAR SYSTEM. . . . OFF

PARKING

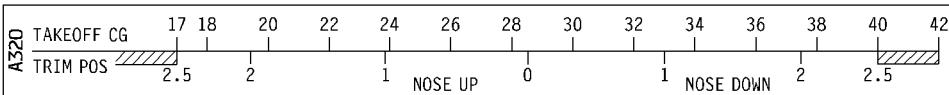
APU BLEED. ON
 ENGINES. OFF
 SEAT BELTS. OFF
 EXT LT. AS RQRD
 FUEL PUMPS. OFF
 PARK BRK and CHOCKS. AS RQRD
 Consider HEAVY RAIN

SECURING THE AIRCRAFT

ADIRS. OFF
 OXYGEN. OFF
 APU BLEED. OFF
 EMER EXIT LT. OFF
 NO SMOKING. OFF
 APU AND BAT. OFF
 Consider COLD WEATHER

EMERGENCY EVACUATION

REFER TO 7.00



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