01.00 CONTENTS

GENERAL

This section includes the limitations required by the regulations and contained in the Flight Manual.
All references to airspeed, Mach and altitude relate to indicated airspeed, indicated Mach and pressure altitude, unless otherwise noted.

KIND OF OPERATIONS

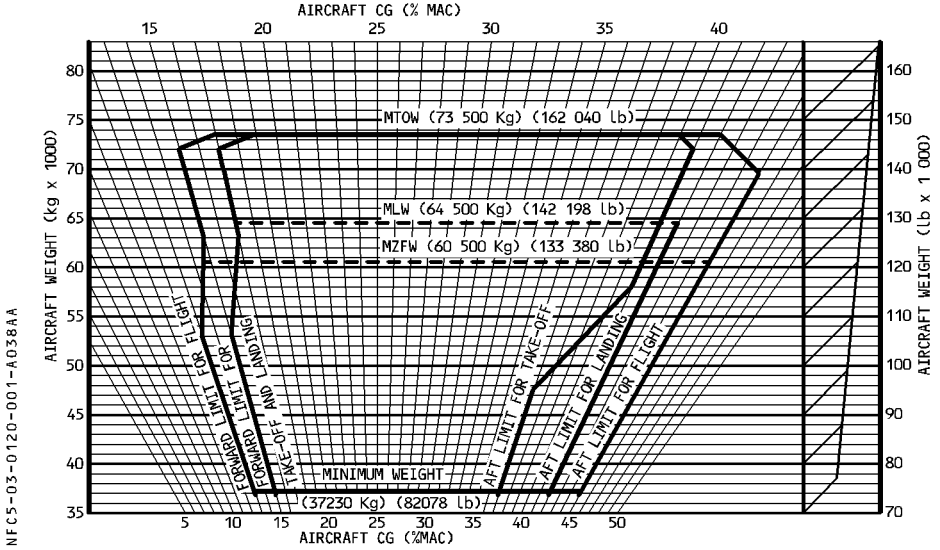
This airplane is certified in the public transport category (passengers and freight) for day and night operations, in the following conditions when the appropriate equipment and instruments required by the airworthiness and operating regulations are approved, installed and in an operable condition :

- VFR and IFR
- Extended overwater flight
- Flight in icing conditions
- Maximum number of passenger seats : 180

MINIMUM FLIGHT CREW

The minimum flight crew consists of 2 pilots.

CENTER OF GRAVITY LIMITS



- CG limits are given in percentage of the reference chord length aft of the leading edge.
- The reference chord length is 4.193 m (13.76 ft). It is 16.31 m (53.51 ft) aft of the aircraft nose.
- The CG must always be within these limits, regardless of fuel load.

WEIGHT LIMITATIONS

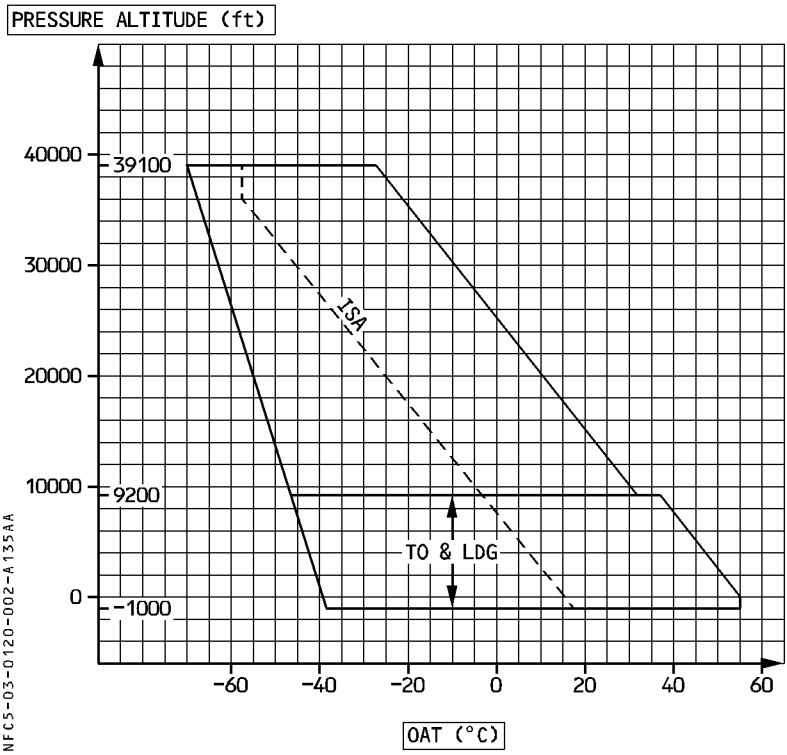
Maximum taxi weight . . . . . 73 900 kg (162 922 lb)
Maximum takeoff weight (brake release) . . . . . 73 500 kg (162 040 lb)
Maximum landing weight . . . . . 64 500 kg (142 198 lb)
Maximum zero fuel weight . . . . . 60 500 kg (133 380 lb)
Minimum weight . . . . . 37 230 kg (82 078 lb)

In exceptional cases (in flight turn back or diversion), an immediate landing at weight above maximum landing weight is permitted, provided the pilot follows the overweight landing procedure.

FLIGHT MANEUVERING LOAD ACCELERATION LIMITS

Clean configuration . . . . . – 1 g to + 2.5 g
Slats and flaps extended . . . . . 0 g to + 2 g
Slats extended and flaps retracted . . . . . 0 g to + 2 g

ENVIRONMENTAL ENVELOPE



AIRPORT OPERATIONS

- Runway slope (mean) . . . . . ± 2 %
- Runway altitude . . . . . 9200 feet
- Nominal runway width . . . . . 45 meters
- Wind for takeoff and landing :
  - · Maximum crosswind demonstrated for takeoff . . 29 knots gusting up to 38 knots*
  - · Maximum crosswind demonstrated for landing . . 33 knots gusting up to 38 knots*
  - · Maximum tailwind . . . . . 10 knots

    * : Maximum crosswind values have been demonstrated with flight controls in normal law, as well as in direct law with and without yaw damper.

R - Wind for passenger / cargo door operation :

R · Maximum wind for passenger door operation : . . . . . 65 knots

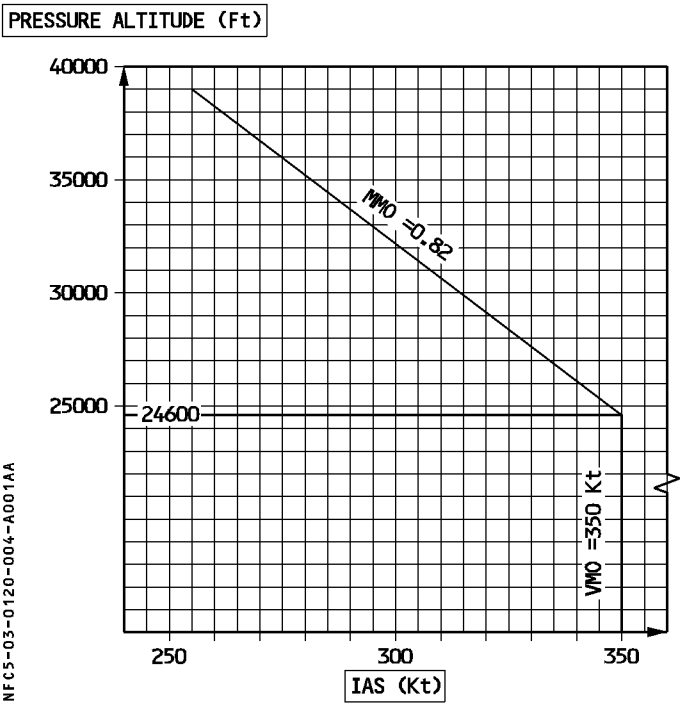
R · Maximum wind for cargo door opening : . . . . . 40 knots

R · The cargo door must be closed, before the wind speed exceeds 65 knots.

SPEED LIMITATIONS

MAXIMUM OPERATING SPEED VMO/MMO

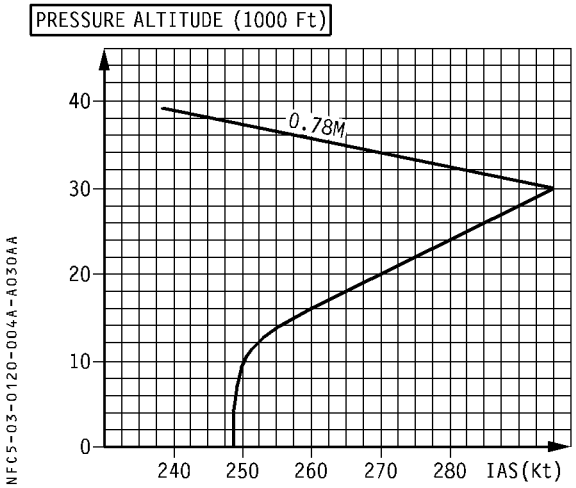
R



The maximum operating limit speed VMO/MMO may not be exceeded deliberately in any regime of flight.

MAXIMUM DESIGN MANOEUVERING SPEED VA

(Applies in alternate or direct flight control laws only).



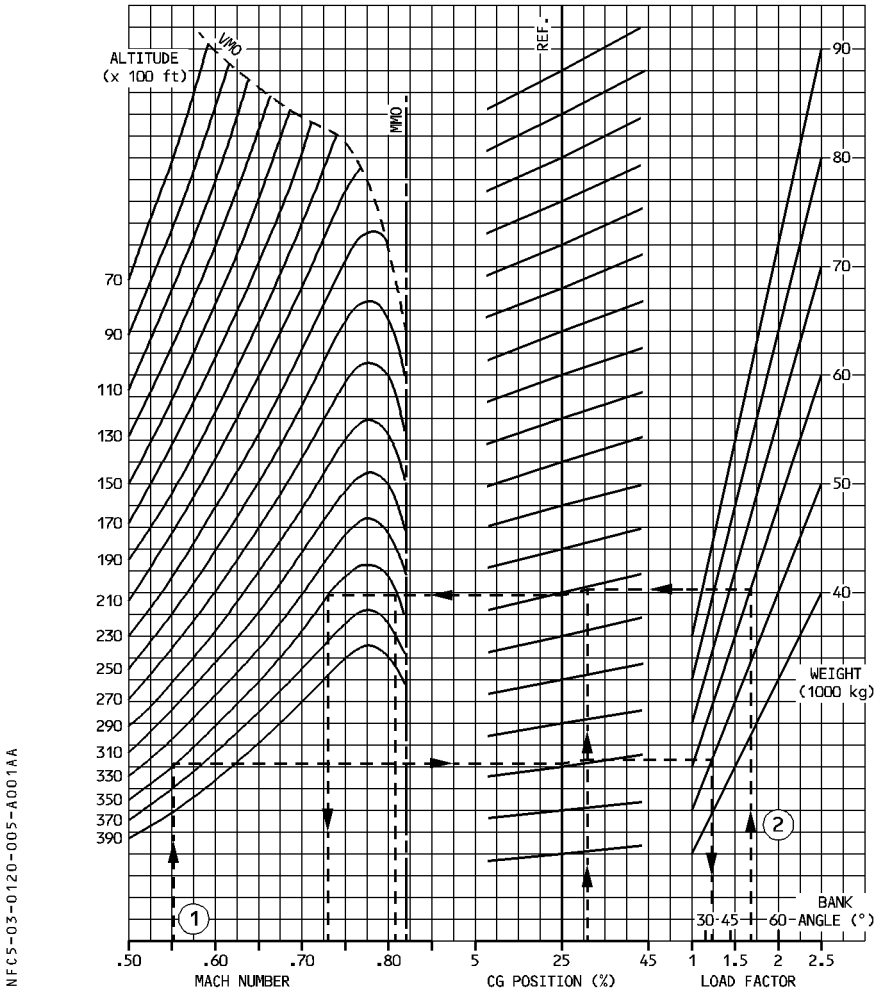
If alternate or direct law is active, full ailerons and rudder application should be confined to speeds below VA.
If alternate or direct law is active manoeuvres involving angle of attack near stall should be confined to speeds below VA.

CAUTION

Rapid and large alternating control inputs, especially in combination with large changes in pitch, roll, or yaw (e.g. large sideslip angles) may result in structural failures at any speed, even below VA.

BUFFET ONSET

R



R Examples :

R 1. Determine Maximum Bank Angle limited by buffet :

R DATA : M = 0.55, FL = 350, CG = 31 %, WEIGHT = 50000 kg

R RESULT : load factor = 1.25 g or 35° bank

R 2. Determine low and high speed limited by buffet :

R DATA : 52° bank or 1.7 g, WEIGHT = 60000 kg, CG = 31%, FL = 350

R RESULT : M = 0.73 (low speed buffet) and M = 0.81 (high speed buffet).

MINIMUM CONTROL SPEEDS

R

Altitude (ft)	VMCA (KT CAS)	VMCG (KT IAS)		
		CONF 1 + F	CONF 2	CONF 3
0	110	109.5	107.5	107
2000	108	107.5	105.5	105
4000	107.5	107	105	104.5
6000	105.5	105	103	102.5
8000	103	102.5	100.5	100
9200	101.2	100.5	98.5	98

MAXIMUM FLAPS/SLATS SPEEDS

LEVER POSITION	SLATS	FLAPS	Ind. on ECAM	MAX SPD	FLIGHT PHASE
1	18	0	1	230	HOLDING
1	18	10	1 + F	215	TAKEOFF
2	22	15	2	200	TAKEOFF/APPROACH
3	22	20	3	185	TAKEOFF/APPROACH/LANDING
FULL	27	35	FULL	177	LANDING

GEAR DOWN SPEEDS

- Maximum speed with landing gear extended (VLE) 280 kt/M.67
- Maximum speed at which the landing gear may be extended (VLO extension) . 250 kt
- Maximum speed at which the landing gear may be retracted (VLO retraction) . 220 kt
- Maximum altitude at which the landing gear may be extended . . . . . 25 000 ft

MAXIMUM TIRE SPEED

- Ground speed . . . . . 195 knots

WINDSHIELD WIPERS IN USE

- Maximum speed . . . . . 230 knots

COCKPIT WINDOW OPEN

- Maximum speed . . . . . 200 knots

TAXI SPEED

R When the taxi weight is higher than 76 000 kg (167 550 lb), do not exceed a taxi speed of 20 kt during a turn.

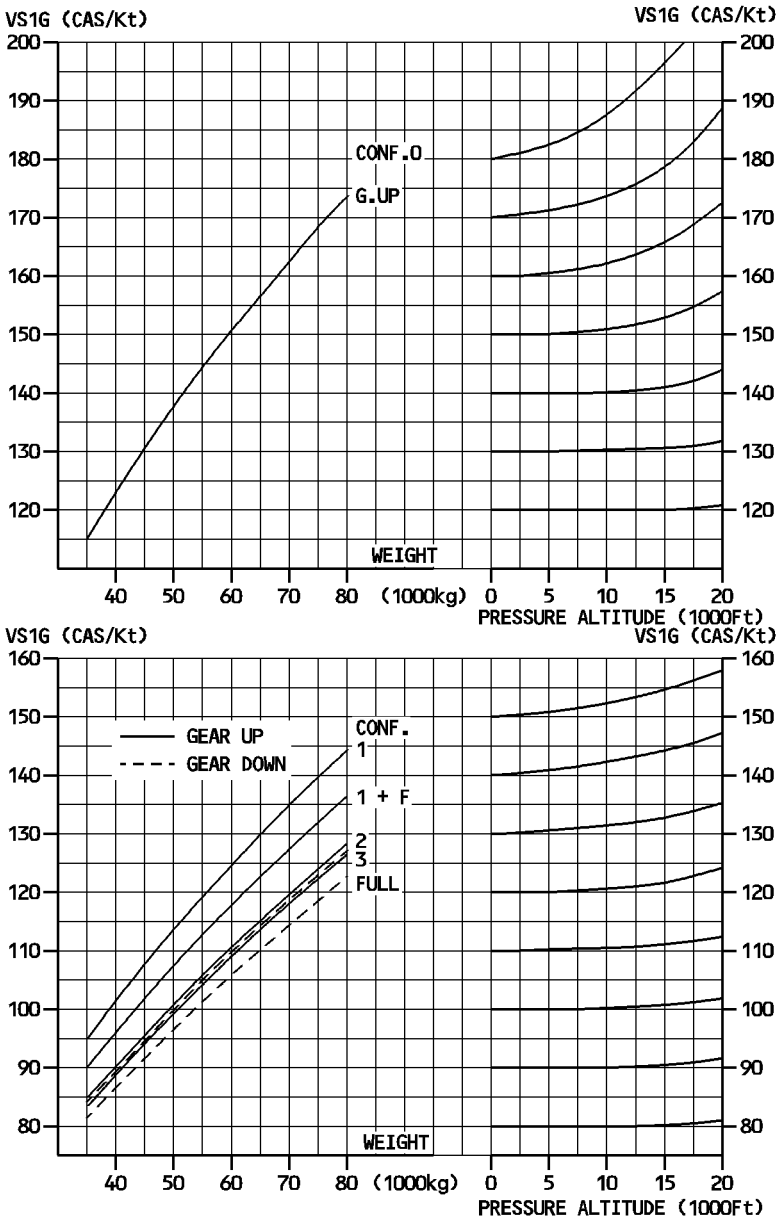
STALLING SPEEDS

The following graphs serve to determine the VS according to the configuration.
These graphs have been established for

- Basic forward CG
  - 23 % CG location in clean configuration
  - 25 % CG location in takeoff, approach and landing configuration
- Alternate forward CG
  - forward CG limit. See 3.01.20 p 1.

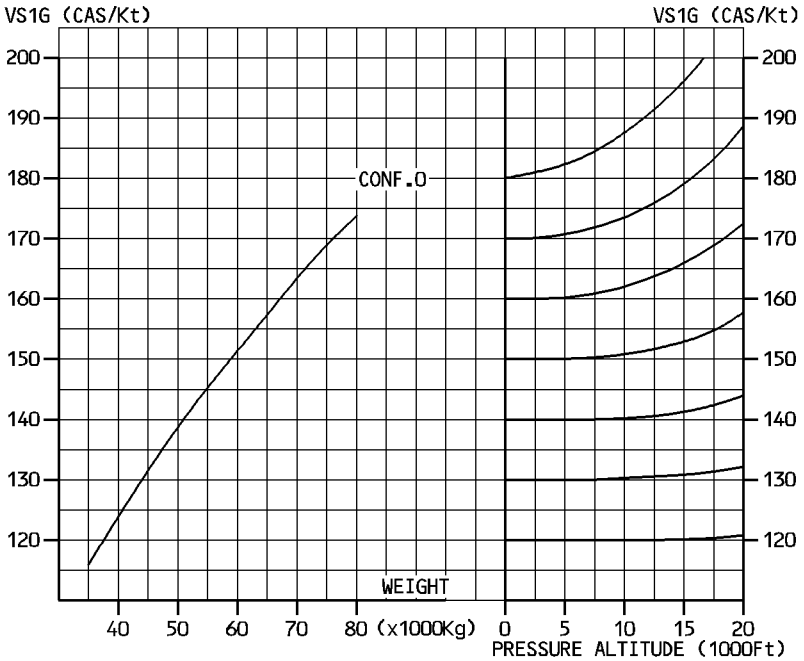
In most cases the CG location remains within the CG envelope below. Consequently the basic forward CG must be retained for any performance determination.
In some rare cases, if more forward CG is anticipated during any part of the flight, the alternate forward CG must be retained for any performance determination.

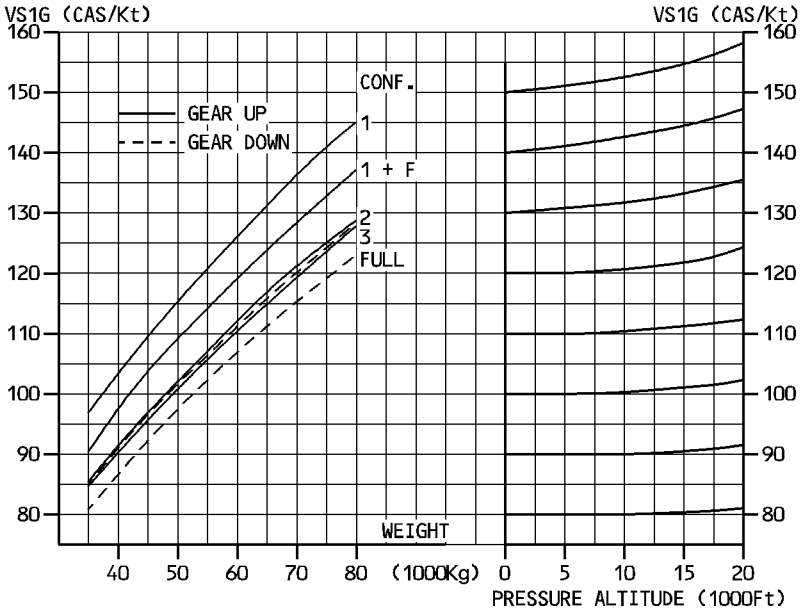
STALLING SPEEDS (BASIC FORWARD C.G.)



NFC5-03-0120-009-A110AA

STALLING SPEEDS (ALTERNATE FORWARD C.G.)

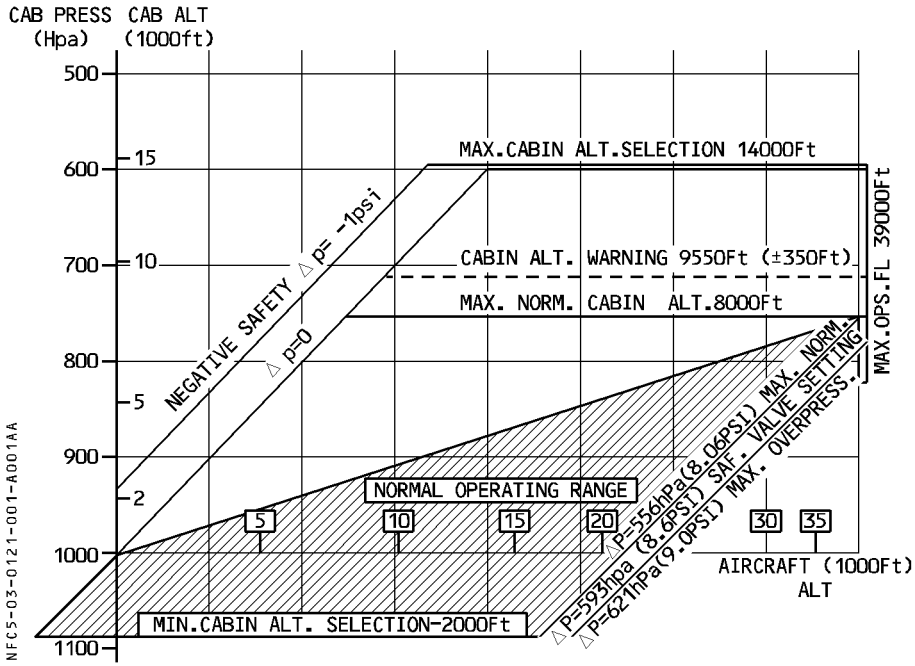




NFCS-03-0120-010-A120AB

CABIN PRESSURE

- Maximum positive differential pressure . . . . . 8.6 psi
- Maximum negative differential pressure . . . . . - 1 psi



Note : Max △p and safety valve setting tolerance = ± 7 hPa (0.1 psi)

RAM AIR INLET

Only open if differential pressure is lower than 1 psi.

AIR CONDITIONING WITH LP GROUND UNIT

- Do not use conditioned air simultaneously from packs and LP ground unit (to avoid chattering of the non return valves).
- Airflow supplied by the ground cart shall not exceed 1.2 kg/s (2.60 lb/s).

R **AIR CONDITIONING WITH HP GROUND UNIT**

R — Do not use HP ground unit when APU supplies bleed air to avoid bleed system damage.

AVIONICS VENTILATION

LEFT INTENTIONALLY BLANK

GENERAL

AUTO PILOT FUNCTION

Minimum height for use of autopilot on takeoff with SRS mode . . . . . 100 ft AGL
(An internal FMGS logic prevents the autopilot from engaging during the 5 seconds after liftoff).
Minimum height for use of the autopilot in :
Straight-in non precision approach . . . . . applicable MDA (MDH)
Circling approach . . . . . applicable MDA - 100 ft (or MDH - 100 ft)
ILS approach with CAT 1 displayed on FMA . . . . . 160 ft AGL
Go-around (AP or FD engagement) . . . . . 100 ft AGL
All other phases . . . . . 500 ft AGL
Use of the AP or FD in OPEN DES or DES mode is not permitted in approach, unless the FCU altitude is set to, or above, MDA (MDH) or 500 feet, whichever is the highest.

AUTOTHRUST FUNCTION

R Use of the autothrust is approved with, or without, AP/FD in selected or managed mode.

FLIGHT MANAGEMENT FUNCTION

FMGS lateral and vertical navigation has been certified for after takeoff, en route, and terminal area operations, for instrument approach procedures (except ILS, LOC, LOC-BC, LDA, SDF and MLS), and for missed approach procedures.
RNP accuracy with GPS PRIMARY, or radio updating, has been demonstrated to be :

	With AP ON in NAV	With AP OFF and FD ON in NAV	With AP OFF and FD OFF
En route	1 NM	1 NM	1.3 NM
In terminal area	0.5 NM	0.56 NM	0.56 NM
In approach	0.3 NM	0.31 NM	Not authorized

Without GPS PRIMARY (or GPS deselected or inoperative), the accuracy has been demonstrated, provided the appropriate RNP value is checked or entered on the MCDU, and HIGH accuracy is displayed.
Without GPS PRIMARY (or GPS deselected or inoperative), navigation accuracy is a function of ground radio navaid infrastructure, or elapsed time since the last radio update.
The FMGS is also certified for navigation within BRNAV, PRNAV, and RNP 10 airspace.
RNP10 oceanic/remote area operations are approved with GPS PRIMARY or, without GPS PRIMARY (or GPS deselected or inoperative), provided time limitations in IRS only navigation (acceptable to operational authorities), are established.
FMGS approval is based on the assumption that the navigation database has been validated for intended use.
Obstacle clearance and adherence to airspace constraints remains the flight crew's responsibility.
Fuel, time predictions/performance information is provided for advisory purposes only.

R NAV mode may be used after takeoff, provided FMGS runway updating has been checked.

TAKEOFF IN GPS PRIMARY

R For certain airports, where the difference between the local coordinate system and WGS
R 84 (geodesic standard used by GPS, FMS) is not negligible, an incorrect NAV guidance may
R occur after takeoff.
R GPS must be deselected for takeoff from these airports, until a safe altitude is reached.

USE OF NAV AND FINAL APP MODES FOR NON PRECISION APPROACH

NAV, or NAV and FINAL APP mode may be used for VOR, VOR/DME, NDB, NDB/DME or RNAV (including GPS) approach, but not for ILS, LOC, LOC-BC, LDA, SDF, or MLS final approach.

GPS must be deselected for instrument approach procedures not coded in the WGS 84 (or equivalent) coordinate system.

FINAL APP mode guidance capability with GPS PRIMARY has been demonstrated down to MDH/DH (barometric) 250 feet.

VOR, VOR/DME, NDB or NDB/DME approach procedures may be performed, in NAV, or NAV and FINAL APP mode, provided AP or FD is used, and :

- GPS PRIMARY is available. In this case, the reference navaid may be unserviceable, or the airborne radio equipment may be inoperative, or not installed, provided operational approval is obtained.
- Without GPS PRIMARY :
  - The reference navaid and the corresponding airborne equipment is serviceable, tuned, and monitored during the approach, or
  - The radio navaid coverage supports the RNP value, specified for the approach procedure, and an operational approval is obtained.

For GPS approach, GPS PRIMARY must be available.

RNAV approach without GPS PRIMARY may be performed only if the radio navaid coverage supports the RNP value and HIGH accuracy is displayed on the MCDU with the specified RNP, and operational approval is obtained.

NAV mode may be used in the terminal area, provided :

- GPS PRIMARY is available, or
- HIGH accuracy is displayed, and the appropriate RNP is checked or entered on the MCDU, or

R - Navaid raw data is monitored.

Non Precision Approaches with engine-out

If one engine is inoperative, it is not permittted to use the autopilot to perform NPAs in the following modes : FINAL APP, NAV V/S, NAV/FPA.

Only FD use is permitted.

AUTOMATIC APPROACH, LANDING AND ROLL OUT

CATEGORY II

Minimum decision height . . . . . 100 feet AGL
At least one autopilot must be engaged in APPR mode, and CAT 2, CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.
If the crew performs an automatic approach without autoland, the autopilot must be disengaged no later than at 80 feet AGL.

CATEGORY III FAIL PASSIVE (SINGLE)

Minimum decision height . . . . . 50 feet
At least one autopilot must be engaged in APPR mode, and CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.
A/THR must be used in selected or managed speed.

CATEGORY III FAIL OPERATIONAL (DUAL)

A/THR must be used in selected or managed speed.
Alert height . . . . . 100 feet
– CAT III with DH :
Minimum decision height . . . . . 20 feet
2 autopilots must be engaged in APPR mode and CAT 3 DUAL must be displayed on the FMA.
– CAT III without DH :
2 autopilots must be engaged in APPR mode and CAT 3 DUAL must be displayed on the FMA.
Minimum Runway Visual Range . . . . . 75 meters

ENGINE OUT

CAT II and CAT III fail passive autoland are only approved in configuration FULL, and if engine-out procedures are completed before reaching 1000 feet in approach.

MAXIMUM WIND CONDITIONS FOR CAT II OR CAT III AUTOMATIC APPROACH LANDING AND ROLL OUT

Headwind : 30 knots
Tailwind : 10 knots
Crosswind : 20 knots

Note : Wind limitation is based on the surface wind reported by the tower. If the wind displayed on ND exceeds the above–noted autoland limitations, but the tower reports a surface wind within the limitations, then the autopilot can remain engaged. If the tower reports a surface wind beyond limitations, only CAT I automatic approach without autoland can be performed.

AUTOMATIC LANDING

CAT II and CAT III autoland are approved in CONF 3 and CONF FULL.
Automatic landing is demonstrated :
– With CAT II and CAT III ILS beam.
– With slope angle within (– 2.5°, – 3.15°) range.
– For airport altitude at or below 2500 feet.
– At or below the maximum landing weight.
R – At approach speed (VAPP) = VLS + wind correction.
R Minimum wind correction 5 knots ; maximum 15 knots.
Automatic rollout performance has been approved on dry and wet runways, but performance on snow-covered or icy runways has not been demonstrated.

AUTOMATIC LANDING IN CAT I OR BETTER WEATHER CONDITIONS

The automatic landing system's performance has been demonstrated on runways equipped with CAT II or CAT III ILS approaches. However automatic landing in CAT I or better weather conditions is possible on CAT I ground installations or when ILS sensitive areas are not protected, if the following precautions are taken :
– The airline has checked that the ILS beam quality and the effect of terrain profile before the runway have no adverse effect on AP/FD guidance. In particular the effect of terrain discontinuities within 300 meters before the runway threshold must be evaluated.
– The crew is aware that LOC or GS beam fluctuations, independent of the aircraft systems, may occur and the PF is prepared to immediately disconnect the AP and take appropriate action, should unsatisfactory guidance occur.
– At least CAT2 capability is displayed on the FMA and CAT II/CAT III procedures are used.
– Visual references are obtained at an altitude appropriate to the performed CAT I approach, otherwise go–around is initiated.
– When the crew does not intend to perform an autoland, they should disconnect the AP at or above 80 feet : this altitude being the minimum to take over and feel comfortable. Nevertheless, for safety purposes, the AP may be disconnected at anytime.

ELECTRICAL

- MAX continuous load per generator . . . . . 100 % (90 kVA)
- MAX continuous load per TR (continuous) . . . . . 200 A

Electrical Outlets

It is forbidden to use the electrical outlets during takeoff and landing.

In Seat Power Supply System (ISPSS)

Airworthiness approval of the ISPSS for Portable Electronic Devices (PED) does not constitute an operational approval to connect a PED to the system. The In Seat Power Supply System (ISPSS) for PED, carried by the passengers, must be switched off during takeoff and landing.

LEFT INTENTIONALLY BLANK

FLIGHT CONTROL

Flaps and slats :
Max operating altitude with slats or slats and flaps extended is 20 000 feet.

LEFT INTENTIONALLY BLANK

GENERAL

FUEL AND ADDITIVE SPECIFICATIONS

– See engine manufacturer specification
– The fuel system has been certified for JET A1, JP 8, JET A, JP 5, RT, TS-1, JET B or JP 4.

MAXIMUM ALLOWED WING FUEL IMBALANCE

· INNER TANKS

Tank Fuel Quantity (Heavier tank)	Maximum allowed imbalance
Full (5 350 kg) (11 795 lb)	1 500 kg (3 307 lb)
4 300 kg (9 480 lb)	1 600 kg (3 520 lb)
2 250 kg (4 960 lb)	2 250 kg (4 960 lb)

R The variation is linear between these values
(No limitation below 2 250 kg/4 960 lb)
· OUTER TANKS

Maximum allowed imbalance	530 kg (1 168 lb)*

R * Maximum outer wing tank imbalance (one full/one empty) is allowed provided :
· Fuel content of one side (outer + inner) is equal to the fuel content of the other side (outer + inner),
or
· On the side of the lighter outer tank, the inner tank fuel quantity is higher than the opposite inner tank quantity, up to a maximum of 3000 kg/6614 lb higher.

FUEL TEMPERATURE

	JET A1/ JP 8	JET A	JP 5	RT	TS-1	JET B	JP 4
MINI	– 43°C	– 36°C (1)	– 42°C	– 45°C	– 45°C	– 46°C	– 54°C
MAXI	54°C					49°C	

(1) : For JET A only, if TAT reaches – 34°C, monitor on ECAM FUEL page that fuel temperature remains higher than – 36°C.

MINIMUM FUEL QUANTITY FOR TAKEOFF : 1 500 kg/3 307 lb

WING TK LO LVL warning must not be displayed on ECAM for takeoff.

WHEN USING JP 4 or JET B

Fuel in center tank is to be regarded as unusable if the wing fuel temperature exceeds the following values before engine start and if the given flight level is exceeded before the center tank fuel has been used :

+ 30°C not above FL 350
+ 40°C not above FL 300
+ 49°C not above FL 250

Reason : At high altitude with high fuel temperature, the pressure delivered by the center tank pumps becomes lower than the pressure delivered by the wing tank pumps.

FUEL MANAGEMENT

- Tanks must be emptied in the following order :
  · center tank then wing tanks
- Takeoff on center tank is prohibited

HYDRAULIC

Normal operating pressure 3000 psi ± 200

LEFT INTENTIONALLY BLANK

GENERAL

BRAKES

Maximum brake temperature for takeoff (brake fans (◁) off) . . . . . 300° C

AUTOBRAKE

Use of the autobrake does not relieve the pilot of his responsibility to safely stop within the available runway length, by taking over brake control with brake pedals, if necessary.
The pilot may disengage the automatic braking system, either by pressing the armed mode pushbutton, or by applying firm action on the brake pedals.

PARKING BRAKE

CAUTION
Do not set N1 above 75 % on both engines with the parking brake ON.

TAXI WITH DEFLATED TIRES

R If tire damage is suspected after landing or after a rejected takeoff, an inspection of the tires is required before taxi. If the tire is deflated but not damaged, the aircraft can be taxied at low speed with the following limitations :

1. If one tire is deflated on one or more gears (ie. a maximum of three tires), the speed should be limited to 7 knots when turning.

R R 2. If two tires are deflated on the same main gear (the other main gear tires not being deflated), speed should be limited to 3 knots and the nose wheel steering angle limited to 30 degrees.

INERTIAL REFERENCE SYSTEM

IRS ground alignment is possible up to 82 degrees latitude.
In NAV mode, the IRS will not provide a valid magnetic heading :

- Above 82 degrees North
- Above 73 degrees North, between 90 degrees and 120 degrees West (magnetic polar region)
- Above 60 degrees South.

Flight outside the above-noted limits is prohibited.

ENHANCED GROUND PROXIMITY WARNING SYSTEM (EGPWS) ◁

- Aircraft navigation is not to be predicated on the use of the terrain display.
  The terrain display is only intended as a situational awareness tool, and may not provide the accuracy on which to solely base terrain avoidance maneuvers.
  The EGPWS database, display, and alerting algorithms, do not currently take into account man-made obstructions.

R - The EGPWS enhanced function should be inhibited (TERR pushbutton to OFF, on the
R GPWS panel) when the aircraft position is less than 15 NM from the airfield :
R — For operations to/from runways not incorporated in the EGPWS database.
R — For specific approach procedures, which have previously been identified as potentially
R producing false terrain alerts.

COCKPIT FIXED OXYGEN SYSTEM

MINIMUM FLIGHT CREW OXYGEN PRESSURE

REF TEMPERATURE *		°C	– 10	0	10	20	30	40	50
		°F	14	32	50	68	86	104	122
MIN ** BOTTLE PRESSURE (PSI)	2 CREW MEMBERS		656	681	706	731	756	781	806
	2 CREW MEMBERS	+1 OBS	861	893	926	959	992	1024	1057
	2 CREW MEMBERS	+2 OBS	1090	1132	1173	1215	1256	1298	1339

* REF TEMPERATURE :
. on ground : (OAT + COCKPIT TEMP) / 2
. in flight : CAB TEMP (°C) – 10°C
or
CAB TEMP (°F) – 18° F

** MINIMUM BOTTLE PRESSURE TO COVER :
– Preflight checks
– Use of oxygen when only one pilot is in the cockpit
– Unusable quantity (to ensure regulator functioning with minimum pressure)
– Normal system leakage
and
· Protection after loss of cabin pressure with mask regulator on NORMAL (diluted oxygen):
– During emergency descent for all crew members for 13 minutes
R – During cruise at FL 100 for 2 crew members for 107 minutes (or during cruise at FL
R 140 for 4 crew members for 103 minutes).
or
· Protection against smoke with 100 % oxygen for all crew members during 15 minutes at 8000 feet cabin altitude.

Note : The above times, which are based on the use of a sealed mask, may be shorter for bearded crew.

GENERAL

OIL QUANTITY

R Minimum before start . . . . . LOW OIL LEVEL ECAM advisory not displayed

R *Note : When the "LOW OIL LEVEL" message appears on the ECAM APU page, sufficient*
R *oil is available to operate the APU for the next 10 hours.*

APU STARTER

After 3 starter motor duty cycles, wait 60 minutes before attempting 3 more cycles.

ROTOR SPEED

· Maximum N (ECAM display) . . . . . 107 %

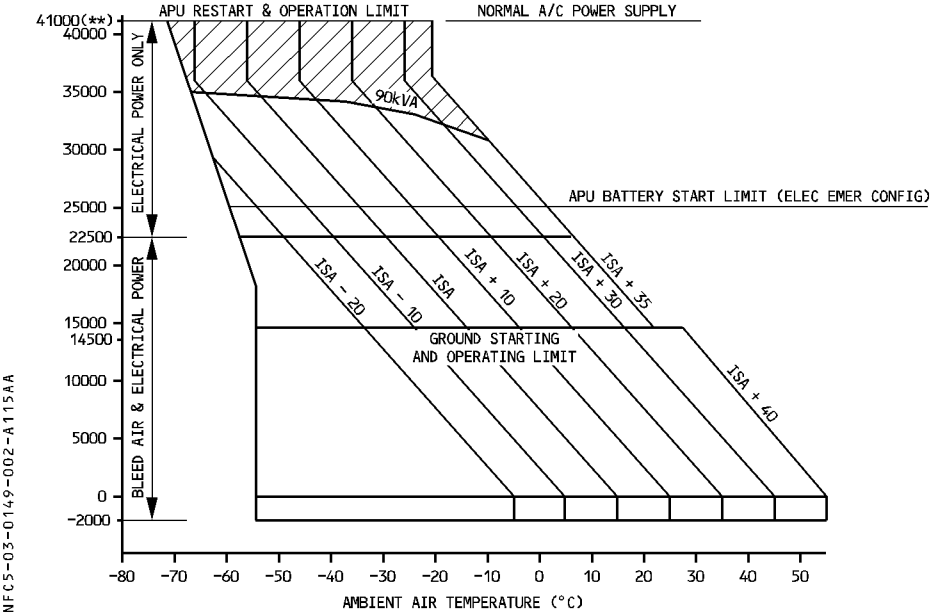
Note : The APU automatically shuts down at 107 % N speed, that appears on the ECAM. This corresponds to an actual N speed of 106 %.

EGT

· Maximum EGT . . . . . 675 degrees C
· Maximum for start (below 35000 feet) . . . . . 1090 degrees C
· Maximum for start (above 35000 feet) . . . . . 1120 degrees C

ENVELOPE

R



GENERATOR LOAD IN FLIGHT					
Altitude (ft)	ISA	ISA + 10	ISA + 20	ISA + 30	ISA + 35
25000	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)
30000	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	98 % (88 KVA)
35000	93 % (84 KVA)	91% (82 KVA)	88 % (79 KVA)	84 % (76 KVA)	79 % (71 KVA)
39000	71 % (64 KVA)	69 % (62 KVA)	68 % (61 KVA)	63 % (57 KVA)	61 % (55 KVA)
41000**	57 % (51 KVA)	55 % (50 KVA)	55 % (50 KVA)	54 % (49 KVA)	53 % (48 KVA)

GENERATOR LOAD ON THE GROUND							
Altitude (ft)	MODE	ISA	IAS + 10	ISA + 20	ISA + 30	ISA + 35	ISA + 40
14500	ENG START	100 % (90 KVA)	100 % (90 KVA)	98 % (88 KVA)	85 % (77 KVA*)	79 % (71 KVA*)	68 % (61 KVA*)
	PACKS	100 % (90 KVA)	100 % (90 KVA)	91 % (82 KVA)	78 % (70 KVA)	70 % (63 KVA)	58 % (52 KVA)
9200	ENG START	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	91 % (82 KVA)	83 % (75 KVA)	72 % (65 KVA)
	PACKS	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	87 % (78 KVA)	78 % (70 KVA)	67 % (60 KVA)
8000	ENG START	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	92 % (83 KVA)	84 % (76 KVA)	74 % (67 KVA)
	PACKS	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	89 % (80 KVA)	79 % (71 KVA)	70 % (63 KVA)
0	ENG START	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	90 % (81 KVA)	81 % (73 KVA)
	PACKS	100 % (90 KVA)	100 % (90 KVA)	100 % (90 KVA)	91 % (82 KVA)	83 % (75 KVA)	75 % (68 KVA)

(*) : Generator load with maximum bleed performance.
(**) : Only for aircraft certified up to that flight level.

– Electric power extraction :
At or below 25000 ft :
· ISA + 35° and below . . . . . 90 kVA
– Air bleed and generator load in flight :

MAXIMUM ALTITUDE FOR BLEED AIR AND GENERATOR LOAD IN FLIGHT			
TEMP ▶ MAX ALT (FT) ▼	ISA	ISA + 20	ISA + 35
ENG START UP TO 20000 ft	92 % (83 KVA)	64 % (58 KVA)	45 % (41 KVA)
ONE PACK UP TO 22500 ft	78 % (70 KVA)	67 % (60 KVA)	63 % (57 KVA)
TWO PACKS UP TO 15000 ft	100 % (90 KVA)	79 % (71 KVA)	64 % (58 KVA)

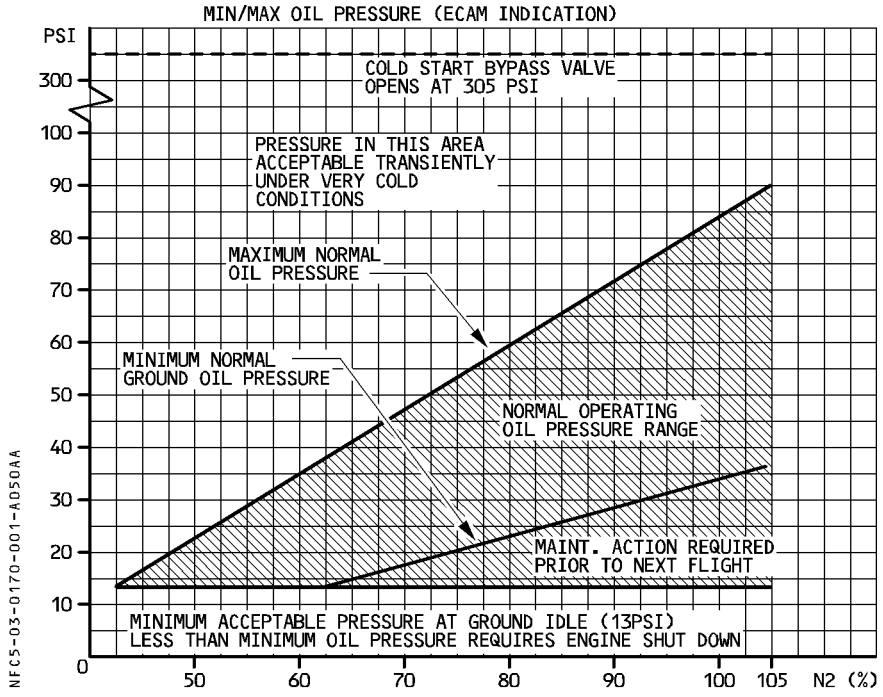
– Air bleed extraction for wing anti-icing is not permitted.

THRUST SETTING/EGT LIMITS

OPERATING CONDITION	TIME LIMIT	EGT LIMIT	NOTE
TAKEOFF and GO-AROUND	5 mn	950° C	
	10 mn		Only in case of engine failure
MCT	Unlimited	915° C	
STARTING		725° C	

OIL

Maximum continuous temperature . . . . . 140° C
Maximum transient temperature (15 minutes) . . . . . 155° C
Minimum starting temperature . . . . . – 40° C
R Minimum temperature for takeoff . . . . . – 10° C
Minimum oil quantity . . . . . refer to 3.03.04



RPM

N1 max . . . . . 104 %

Note : The N1 limit depends upon ambient conditions and engine airbleed configuration. These may limit N1 to a value lower than the one noted above (see 3.05.06).

N2 max . . . . . 105 %

STARTER

- 4 consecutive cycles : Each lasts a maximum of 2 minutes.
- Pause between start attempts : 20 seconds.
- Cooling period, after 4 start attempts : 15 minutes.
- No running engagement of the starter, when N2 is above 20 %.

REVERSE THRUST

- It is not permitted to select reverse thrust in flight.
- It is not permitted to back up the aircraft with reverse thrust.
- Maximum reverse should not be used below 70 knots. (Idle reverse is permitted down to aircraft stop).

REDUCED THRUST TAKEOFF

- Takeoff at reduced thrust is only permitted, if the airplane meets all applicable performance requirements at the planned takeoff weight, with the operating engines at the thrust available for the assumed temperature.
- Thrust reduction must not exceed 25 % of the full rated takeoff thrust. To meet this
R requirement, the flexible temperature must not be higher than ISA + 53 (T MAX FLEX).
- The assumed temperature must not be lower than the flat rating temperature, or the actual OAT.
- Takeoff at reduced thrust is not permitted on contaminated runways.
- Takeoff at reduced thrust is permitted with any inoperative item affecting the performance, only if the associated performance shortfall has been applied to meet all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flex temperature.