A320 LIMITATIONS

Last Updated 01st SEP 2023

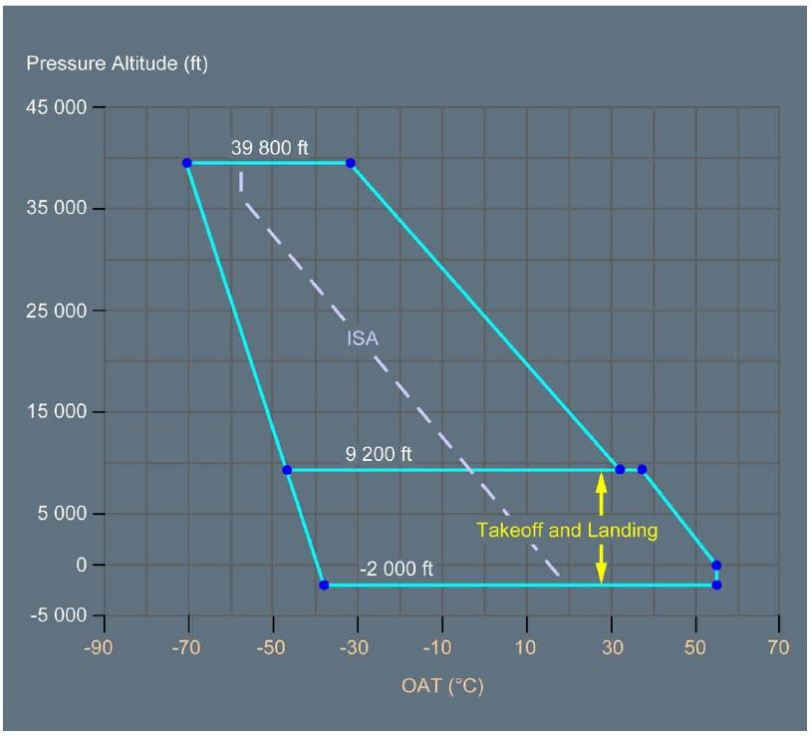
TheAirlinePilots.com

AIRCRAFT GENERAL

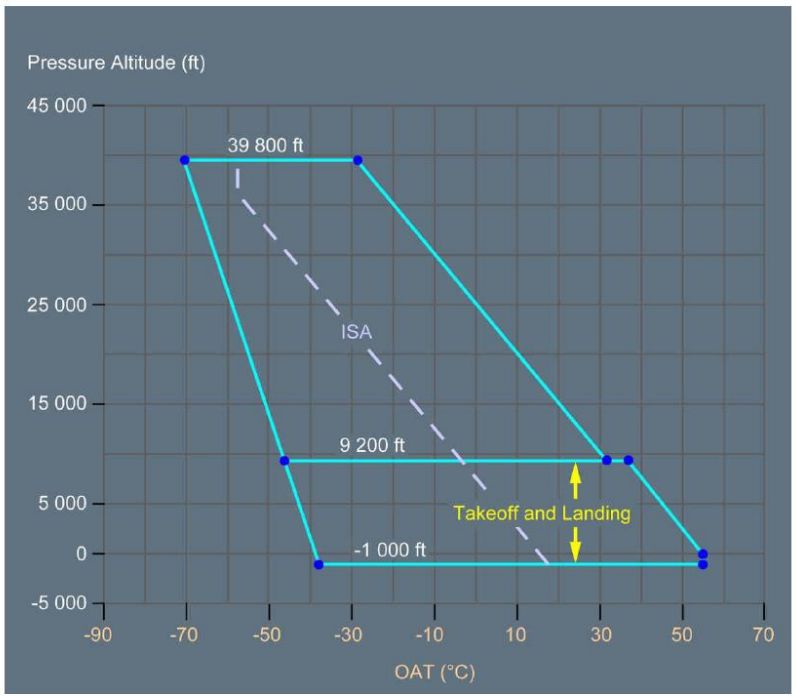
MSN	Registratior	Model
02155	AP-BLB	320-214
02212	AP-BLC	320-214
02719	AP-BLU	320-214
02758	AP-BLV	320-214
02789	AP-BLW	320-214
02926	AP-BLY	320-216
02944	AP-BLZ	320-216
03031	AP-BLA	320-214
03060	AP-BLS	320-214
03097	AP-BLT	320-214
04392	AP-BMX	320-214
05152	AP-BMV	320-214
05162	AP-BMY	320-214
05253	AP-BOM	320-214
05746	AP-BON	320-214
07784	AP-BOK	320-214
07792	AP-BOL	320-214

ENVIRONMENTAL ENVELOPE

Ident.: LIM-AG-OPS-00021818.0027001 / 27 JUL 17
Applicable to: MSN 02719-03097



Applicable to: MSN 02155-02274



FLIGHT MANEUVERING LOAD ACCELERATION LIMITS

Clean configuration: -1 g to +2.5 g

Other: 0 g to +2 g

ENVIRONMENT LIMITS

Runway slope (mean): ±2 %

Runway altitude: 9 200 ft

Nominal runway width: 148 feet

Minimal runway width for AP-BLU, BLV, BLW: 98 feet

Maximum demonstrated crosswind (takeoff and landing): 38 knots (gust included)

Maximum tailwind for Takeoff – BLY & BLZ = 15 knots, Others 10 knots.

Maximum tailwind for Landing – BLY & BLZ = 15 knots, Others 10 knots.

For landing with a tailwind greater than 10 knots, use FLAPS FULL only.

Maximum tailwind for Automatic Landing and Rollout = 10 knots.

Maximum wind for passenger door operation is 65 kt.

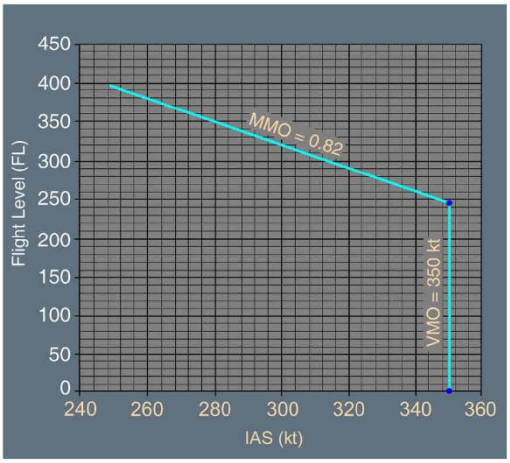
Maximum wind for FWD and AFT cargo door operation is 40 knots (or 50 knots, if the aircraft nose is into the wind, or if the FWD and AFT cargo doors are on the leeward side). The FWD and AFT cargo doors must be closed before the wind speed exceeds 65 kt.

WEIGHT LIMITATIONS

Weight Limits (Kgs)	MSN 21 / MSN 22	MSN 29	MSN 27	MSN 30	Approx. values to keep in mind
	BLB – BLC –BLD	BLY –BLZ	BLU – BLV – BLW	BLA – BLS – BLT	
Max Taxi	77,400	75,900 / 73,900	77,400 / 75,900 / 73,900		400 above MTOW
MTOW (brake release)	77,000	75,500 / 73,500	77,000 / 75,500 / 73,500		75 tons
MLW	64,500	66,000	66,000		65 tons
MZFW	61,000	62,500	62,500		60 tons
Min Weight	37,230	37,230	37,230		37 tons

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. For dual or multiple max weights, a/c placard reflects the current limit.

SPEED LIMITS



MINIMUM CONTROL SPEEDS

- VMCL – 108 Knots for BLY and BLZ and 113 Knots for others.
- VMCA – 110 Knots IAS at Sea Level, decreasing with increase in altitude.
- VMCG – 111 Knots IAS at Sea Level with CONF 1+F, decreasing with increase in altitude and flap setting.
- For AP-BLY and AP-BLZ, same as above except the speed is 105 instead of 110 for VMCA and 106 instead of 111 for VMCG.
- So as a rule of thumb **115 KNOTS IS THE RED LINE** for all models and for all minimum control speeds.
- For exact values see the table given in FCOM Limitations – LIM-AG-SPD.

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

- VLE – 280 / 0.67
- VLO Extension – 250 / 0.60
- VLO Retraction – 220 / 0.54

TYRE SPEED: Maximum Ground Speed – 195 Knots

WIPERS IN USE: Max Speed – 230 Knots (applicable when the wipers are sweeping).

COCKPIT WINDOW OPEN: Max Speed – 200 Knots.

TAXI SPEED:
If takeoff weight > 76,000 kg – Do not exceed a taxi speed of 20 knots during a turn.

AIR BLEED, CONDITIONING, PRESSURIZATION AND VENTILATION

With passengers on board, it is not recommended to exceed 20 min without air conditioning supply.

APU WITH HP GROUND UNIT

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

AIR-CONDITIONING WITH LP GROUND UNIT

Do not use conditioned air simultaneously from packs and LP ground unit.

AVIONICS VENTILATION

During ground operations, limit the aircraft electric power supply with avionics ventilation system in normal configuration as follows: OAT = 49°C No Limitation. Above that just go home or open FCOM LIM AIR (For 55°C – 2 hours, 60°C – 1 hour & 64°C – ½ hour).

CABIN PRESSURE

Maximum positive differential pressure: 9.0 PSI

Maximum negative differential pressure: -1 PSI

Safety relief valve setting: 8.6 PSI

RAM AIR INLET

Open if Differential Pressure < 1psi.

AUTOFLIGHT

AUTOPILOT FUNCTION

Minimum values for use of autopilot:

Takeoff with SRS mode: 100 feet AGL and at least 5 seconds after liftoff.

ILS CAT I: 160 feet AGL

ILS CAT II or CAT III: 0 ft AGL

In approach with FINAL APP, V/S or FPA mode: 250 feet AGL

PAR approach (Precision Approach Radar): 250 ft AGL

Circling Approach: 500 feet AGL for CAT C and 600 feet AGL for CAT D

After Manual Go-around: 100 ft AGL

All other phases: 500 ft AGL. (The AP or FD in OP DES or DES mode can be used in approach. However, its use is only permitted if the FCU selected altitude is set to, or above, the higher of the two: MDA/MDH or 500 ft AGL)

Note: So basically 100 for takeoff and go-around, 160 for Precision approaches, 250 for non-precision approaches and 500 otherwise.

FLIGHT MANAGEMENT FUNCTION

RNP accuracy with GPS PRIMARY ✻ is:

	With AP ON (1)	With AP OFF and FD ON (1)	With AP OFF and FD OFF
En route	1 NM	1 NM	1.1 NM
In terminal area	0.5 NM	0.51 NM	0.51 NM
In approach	0.3 NM	0.3 NM	0.3 NM with F-LOC ✻ deviation Not authorized without F-LOC ✻ deviation

(1) - *In NAV (all phases), or*
- *In F-LOC ✻ (approach phase)*

DEGRADED SITUATION

If GPS PRIMARY LOST is displayed, the navigation accuracy remains sufficient for RNP operations provided that, the RNP value is checked or entered on the MCDU and HIGH ACCURACY is displayed.

PREREQUISTES FOR USE OF NAV MODE AT TAKEOFF

- GPS Primary available
- FMGS Takeoff Updating Checked

PREREQUISTES FOR USE OF NAV MODE IN TERMINAL AREA

- GPS PRIMARY is available, or
- HIGH Accuracy is displayed, and the appropriate RNP is checked or entered on the MCDU, or
- FMS navigation is cross-checked with NAVAID Raw Data

APPROACH BASED ON RADIO NAVAIDS

A NAVAIDS approach performed in NAV, APP NAV or FINAL APP, with AP or FD engaged:

- GPS PRIMARY available – NAVAID unserviceable or airborne equipment inoperative – Approval Required.
- GPS PRIMARY not available – NAVAID and airborne equipment serviceable – Monitor Raw Data during approach.

  Note: FLS is the recommended managed lateral and vertical guidance mode for radio navaids approach.

RNAV APPROACH

1) AN RNAV(RNP) APPROACH:

   - GPS PRIMARY available – RNAV(GNSS) approach may be performed.

   - GPS PRIMARY not available – RNAV(GNSS) approach may be performed if:

     - Radio NAVAID coverage supports RNP value.
     - HIGH accuracy is displayed.
     - Approval obtained.

   Note: FLS is the recommended managed lateral and vertical guidance mode for RNAV approach

2) APPROACH BASED ON RADIO NAVAIDS:

   VOR / DME flown with FLS
   - F-APP Displayed on FMA – Navaids & airborne equipment may be inoperative subject to approval.
   - F-APP + Raw Capability Displayed on FMA – Navaids & airborne equipment must be operative tuned and monitored.

   ILS (G/S Out) or LOC APP flown with LOC and F-GS mode of FLS.
   - F-APP Displayed on FMA – Ref navaids for vertical path validation must be tuned and checked at FDP.
   - F-APP + Raw Capability Displayed on FMA – Ref navaids for vertical path validation must be tuned and checked at FDP & monitored during approach.

3) RNAV(GNSS) APPROACH

   - With LNAV Minimum & F-APP capability Displayed on FMA – MAY be flown with FLS
   - With LNAV/VNAV Minimum & F-APP capability Displayed on FMA – MUST be flown with FLS

   Note: The RNAV(GNSS) approach limitations and procedures must be used to perform an RNAV approach for which the GNSS is not required.

NON-PRECISION APPROACHES WITH ENGINE-OUT

For AP-BLY and BLZ: If one engine is inoperative, it is not permitted to use the autopilot to perform NPAs in:

- FINAL APP mode, or
- NAV V/S, or
- NAV FPA.

Only FD use is permitted.

ILS CAT II

Minimum decision height: 100 ft AGL

At least one autopilot must be engaged in APPR mode.

CAT 2, CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.

For manual landing, the autopilot must be disengaged not later than 80 ft AGL.

SPECIAL AUTHORIZATION OR OTHER THAN STANDARD CAT II

Same as ILS CAT II except:

- With HUD: use HUD to monitor the approach and perform an automatic or manual landing.
- Without HUD: Must perform an automatic landing.

BASIC DEFINITIONS

Fail-Operational Automatic Landing System:

An automatic landing system is fail-operational if, in the event of a failure, the approach, flare and landing can be completed by the remaining part of the automatic system. In the event of a failure, the automatic landing system will operate as a fail-passive system.

The following are typical arrangements:

(i) Two monitored automatic pilots, one remaining operative after a failure.

(ii) Three automatic pilots, two remaining operative (to permit comparison and provide necessary failure detection and protection) after a failure.

Fail-Passive Automatic Landing System:

An automatic landing system is fail passive if, in the event of a failure, there is no significant out-of-trim condition or deviation of flight path or attitude but the landing is not completed automatically. For a fail-passive automatic landing system the pilot assumes control of the aircraft after a failure.

The following are typical arrangements:

(i) A monitored automatic pilot in which automatic monitors will provide the necessary failure detection and protection.

(ii) Two automatic pilots with automatic comparison to provide the necessary failure detection and protection.

Fail-Operational Hybrid Landing System:

A system which consists of a primary fail-passive automatic landing system and a secondary independent guidance system enabling the pilot to complete a landing manually after failure of the primary system. A typical secondary independent guidance system consists of a monitored head-up display providing guidance which normally takes the form of command information, but it may alternatively be situation (or deviation) information.

Alert Height:

It is a specified radio height, based on the characteristics of the aeroplane and its fail-operational landing system. In operational use, if a failure occurred above the alert height in one of the required redundant operational systems in the aeroplane (including, where appropriate, ground roll guidance and the reversionary mode in a hybrid system), the approach would be discontinued and a go-around executed unless reversion to a higher decision height is possible. If a failure in one of the required redundant operational systems occurred below the alert height, it would be ignored and the approach continued.

ILS CAT III SINGLE (FAIL PASSIVE)

Minimum decision height: 50 ft AGL

A/THR must be used in selected or managed speed.

At least one autopilot must be engaged in APPR mode.

CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.

ILS CAT III DUAL (FAIL OPERATIONAL)

A/THR must be used in selected or managed speed.

Both autopilots must be engaged in APPR mode.

CAT 3 DUAL must be displayed on the FMA.

Alert height: 100 ft.

- CAT III with DH:
    - Minimum Decision Height: 20 ft
- CAT III without DH:
    - Minimum RVR: 75m

ENGINE OUT CAT II AND CAT III SINGLE APPROACH

Only approved in:

- Configuration FULL.
- Engine-out procedures completed before reaching 1,000 ft.

MAXIMUM WIND CONDITIONS FOR CAT II / III AUTOMATIC APPROACH, LANDING AND ROLLOUT

- 🡻 30 knots headwind.
- 🡸 20 knots crosswind.
- 🡹 10 knots tailwind.

Wind limitation above is ATC reported wind. If wind on ND exceeds the above limits but the tower report is within the above limits, then autopilot can remain engaged. If tower reports is beyond these limits then only CAT I automatic approach without autoland can be performed.

AUTOMATIC LANDING CONFIGURATION

Approved in CONF 3 and CONF FULL for:

- ILS /MLS CAT II and CAT III.
- GLS CAT I.

AUTOMATIC LANDING DEMONSTRATION

Automatic landing is demonstrated:

- With CAT II/III ILS/MLS beam and CAT I GLS Beam.
- With slope angle within –2.5 ° and –3.15 °.
- For airport elevation:
    - At or Below 9200 ft for AP-BLU, BLV, BLW, BLA, BLS, BLT.
    - At or Below 2500 ft for AP-BLB, BLC, BLD, BLY, BLZ.

AUTOMATIC LANDING WITH AUTOMATIC ROLLOUT

- Automatic landing is not allowed below -1 000 ft pressure altitude.
- Automatic rollout performance has been approved on dry and wet runways.
- During automatic rollout with one engine inoperative or one thrust reverser inoperative, the flight crew can use the remaining thrust reverser, provided that the wind does not exceed the maximum wind conditions for automatic rollout.

AUTOLAND IN ILS CAT I

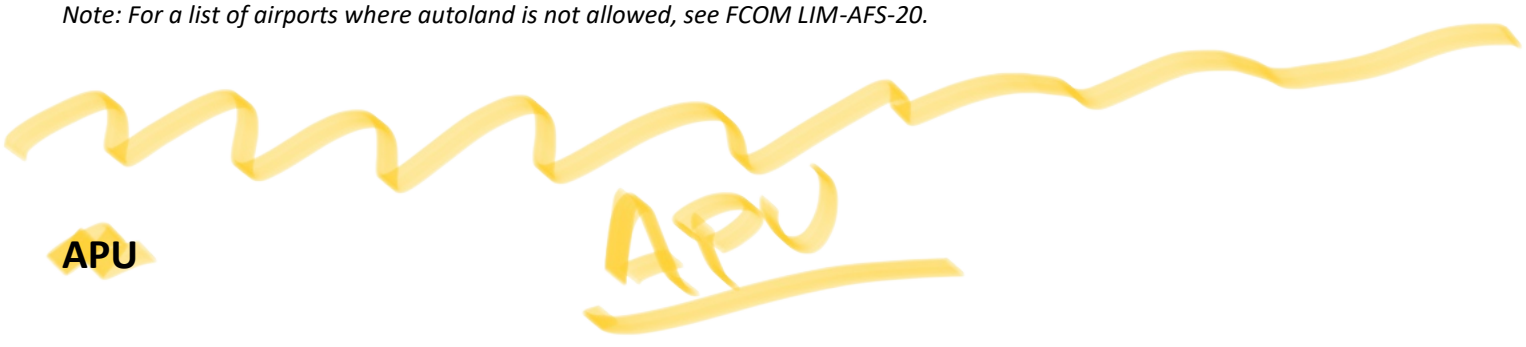
Automatic landing in CAT I or better weather conditions is possible on:

- CAT I ground installations.
- CAT II/III ground installations when ILS/MLS sensitive areas are not protected.

However, following precautions are required:

- Airline must check the ILS/MLS beam quality and the effect of the terrain profile (especially 300 m) before the runway threshold. It should have no adverse effect on AP/FD guidance.
- Aircraft weight should be below the maximum landing weight.
- FMA should show CAT2 capability at least and crew should use CAT II/III procedures.
- Crew awareness that LOC or G/S beam fluctuations may occur.
- Be prepared to disconnect the autopilot in case of unsatisfactory guidance.
- Visual references are obtained at an altitude appropriate for the CAT I approach, if not then go-around.

Note: For a list of airports where autoland is not allowed, see FCOM LIM-AFS-20.



APU

APU OIL QUANTITY

APU may be operated with LOW OIL LEVEL ECAM advisory. Maintenance action is required within next 10 h of APU operation.

APU START

After 3 consecutive start attempts, wait 60 min before a new start attempt.

APU ROTOR SPEED

Maximum N: 107 %

APU automatically shuts down at 107 % N speed, that appears on the ECAM. This corresponds to an actual N speed of 105% for AP-BLB, BLC, BLD or 106% for others.

APU EGT (AP-BLB, BLC, BLD)

Max EGT for APU start:

- Below 25 000 ft: 900 °C
- Above 25 000 ft: 982 °C

Maximum EGT for APU running:

- With 5 seconds confirmation for shutdown: 682 °C
- For Immediate shutdown: From 700 – 742 °C

APU EGT (Other than AP-BLB, BLC, BLD)

Max EGT for APU start:

- Below 35 000 ft: 1090 °C
- Above 35 000 ft: 1120 °C

Maximum EGT for APU running:

- 675 °C

APU START/SHUTDOWN DURING REFUELING/DEFUELING

Permitted with the following restrictions:

- APU failed to start – Do not start again.
- APU automatic shutdown – Do not start again.
- Fuel spill occurs – Perform a normal APU shutdown.

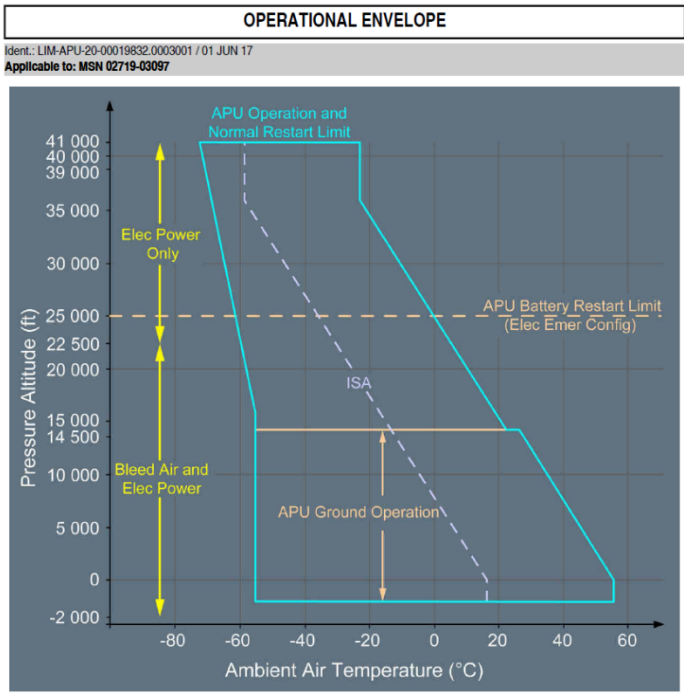
APU BLEED

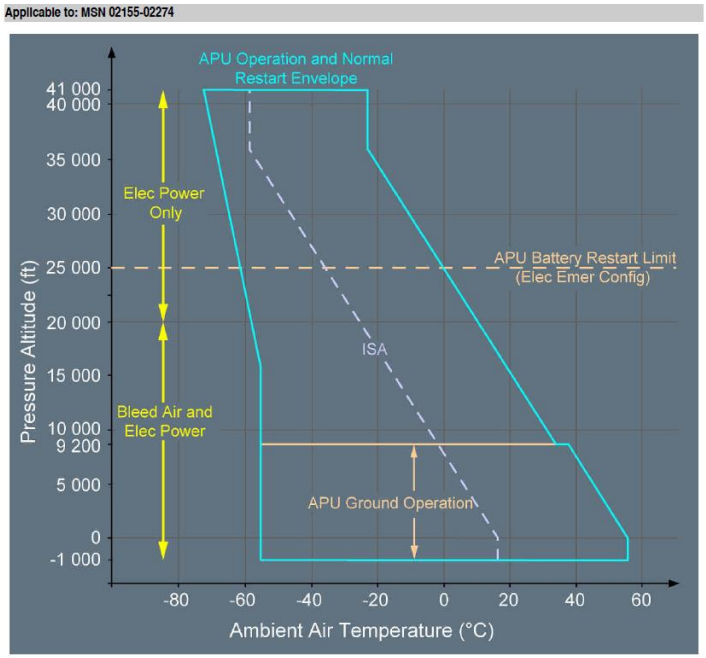
Max altitude to assist engine start: 20,000 ft

Max altitude for air conditioning & pressurization:

- Single Pack Operation:
    - AP-BLB, AP-BLC, BLD: 20,000 ft
    - Other than AP-BLB, BLC, BLD: 22,500 ft
- Dual Pack Operation: 15,000 ft.

Use of APU bleed air for wing anti-ice is not permitted.





ENGINES

THRUST / EGT LIMITS

Takeoff (TOGA, FLEX, DERATES) or Go Around:

- EGT: 950°C
- Time Limit:
    - All Engine Operative: 5 mins
    - One Engine Inoperative: 10 mins

MCT:

- EGT: 915°C.
- Time: Unlimited

Starting: EGT 725°C

SHAFT SPEEDS

N1 max: 104 % (ambient conditions / bleed configuration may limit N1 to a lower value).

N2 max: 105 %

OIL

Max continuous temperature: 140 °C

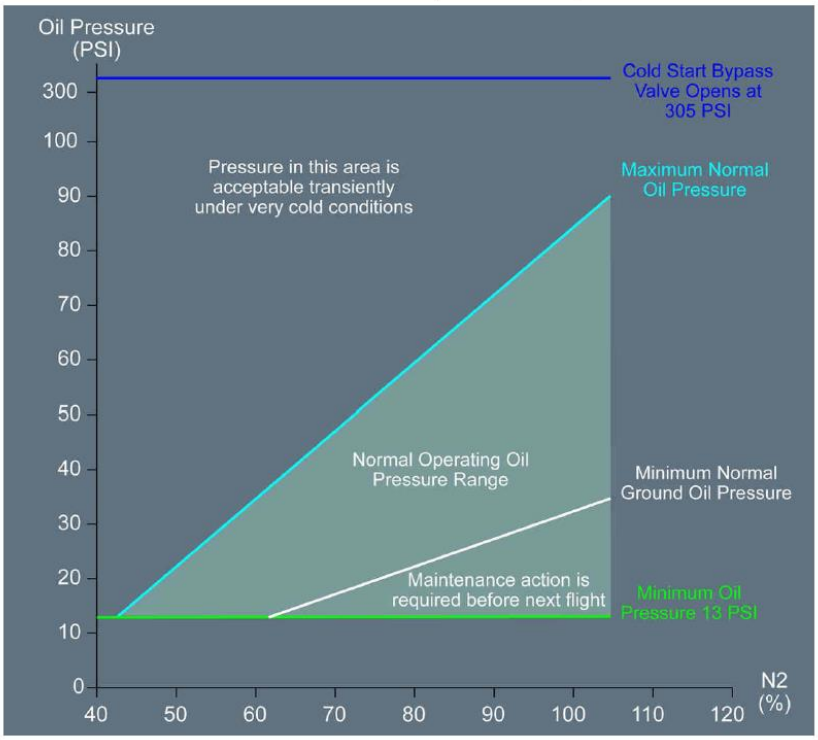
Max transient temperature (15 min): 155 °C

Minimum starting temperature: -40 °C

Minimum temperature for takeoff: -10 °C

Minimum oil quantity: >9.5qt + Estimated Consumption (average consumption is 0.5 qt/h)

MIN/MAX Oil Pressure (ECAM Indication)



STARTER

Auto start with up to 3 start attempts is 1 cycle.

Between successive cycles – 20 seconds pause (for auto or manual ground starts).

After 4 failed cycles – 15 min cooling period.

Starter must not be run when N2 is above 20 % (i.e. no running engagement of starter).

REVERSE THRUST

It is not permitted to select reverse thrust in flight *(oh really! I didn't know that).*

It is not permitted to back up the aircraft with reverse thrust.

No Max reverse below 70 kt (Idle reverse permitted down to aircraft stop).

REDUCE THRUST TAKEOFF

Flex Temperature:

- Upper Limit:
  - ISA+53°C (25 % thrust reduction).
  - ISA+70°C (for AP-BLY and BLZ)
- Lower Limit: TREF & OAT.

Permitted with inoperative items if associated performance shortfall has been applied.

Not permitted on contaminated runways.

DERATED TAKEOFF

Derated takeoff permitted regardless of the runway condition (dry, wet, or contaminated).

FLEX not permitted in association with derated takeoff.

TOGA thrust not permitted when a derated takeoff is performed, except when requested by an abnormal/emergency procedure.

FLIGHT CONTROLS

Maximum operating altitude with flaps and/or slats extended is 20,000 ft.

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.

FUEL

JET A1 – TEMPERATURE LIMITS:

- Max: 54°C
- Min: -43°C

Note: The above values are applicable if fuel is not mixed with some other types. For other fuel types see FCOM-LIM-FUEL.

WHEN USING JP 4 AND 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

e.g. If before engine start the wing fuel temperature is > +30 C and you takeoff in this condition and without finishing center tank fuel you climb above FL350, then the remaining center tank fuel will be not be usable, because:

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 IMBALANCE AT TAKEOFF

INNER TANKS (OUTER TANKS BALANCED)

Tank Fuel Quantity (Heavier Tank)		Maximum Asymmetry	
Full	Full	500	500 kg
3 000 kg	Half	1000	1 050 kg
1 450 kg	Quarter	1500	1 450 kg

The variation is linear between these values.

OUTER TANKS (INNER TANKS BALANCED)

Maximum Asymmetry	50% of its capacity	370 kg

Approx. Quantity for Outer Tank is 700 Kgs and Inner Tank is 5500 Kgs

FUEL IMBALANCE IN FLIGHT AND AT LANDING

INNER TANKS (OUTER TANKS BALANCED)

Tank Fuel Quantity (Heavier Tank)		Maximum Asymmetry	
Full	Full to 3 Quarters	1500	1 500 kg
4 300 kg			1 600 kg
2 250 kg	Half	50% of its capacity	2 250 kg

The variation is linear between these values, and there is no limitation below 2 250 kg

OUTER TANKS

Maximum Asymmetry	690 kg (1 521 lb)(1)

(1) *The maximum fuel imbalance in the outer wing fuel tanks (one full/one empty) is allowed provided that:*

- *The fuel quantity of the outer and inner wing fuel tanks of one side is equal to the fuel quantity of the outer and inner wing fuel tanks on the other side, or*
- *On the side of the lighter outer tank, the fuel quantity of the inner tank is more than the fuel quantity of the opposite inner tank. The difference between the fuel quantity in the inner tanks should not be more than 3 000 kg (6 613 lb).*

Note: In exceptional conditions (i.e. fuel system failure), the above-mentioned values for maximum fuel imbalance may be exceeded without significant effect to the aircraft handling qualities. The aircraft remains fully controllable in all flight phases.

MINIMUM QUANTITY FOR TAKEOFF

- 1500 KG
- WING TK LO LVL warning must not be displayed on ECAM for takeoff.

FUEL MIXABILITY

Various types of fuel can be mixed in all proportions. The freezing point of a fuel mixture varies, based on non-linear laws.

ICE AND RAIN PROTECTION

ICING CONDITIONS

- OAT / TAT < 10^{o}C
- Visible Moisture – Fog (visibility < 1600m), Clouds, Rain, Snow, Sleet, Ice Crystals
- Ramp, Taxiways and Runways with – Standing Water, Snow, Slush

SEVERE ICING

- Ice accumulation on the airframe reaches approximately 5 mm or more.

TAKEOFF LIMITATIONS ON CONTAMINATED RUNWAYS

Takeoff is not recommended on the following runway conditions:

- Wet ice
- Water on top of Compacted Snow
- Dry Snow or Wet Snow over Ice

MAXIMUM RECOMMENDED CROSSWIND ON WET AND CONTAMINATED RUNWAYS

Runway Surface Conditions		Maximum Crosswind for Takeoff (Gust included)	Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	**ESF(1) or PIREP(2)**		
Damp **Wet** Up to 3 mm (1/8") of water **Slush** Up to 3 mm (1/8") **Dry snow** Up to 3 mm (1/8") **Wet snow** Up to 3 mm (1/8") **Frost**	**Good**	38 kt	38 kt
Compacted snow OAT at or below -15 °C	**Good to Medium**	29 kt	29 kt
Dry snow More than 3 mm (1/8"), up to 100 mm (4") **Wet snow** More than 3 mm (1/8"), up to 30 mm (6/5") **Compacted snow** OAT above -15 °C **Dry snow over compacted snow** **Wet snow over compacted snow** **Slippery when wet**	**Medium**	25 kt	25 kt
Water More than 3 mm (1/8"), up to 13 mm (1/2") **Slush** More than 3 mm (1/8"), up to 13 mm (1/2")	**Medium to Poor**	20 kt	20 kt
Ice (cold & dry)	**Poor**	15 kt	15 kt

(1) *ESF: Estimated Surface Friction*

(2) *PIREP: Pilot Report of Braking Action*

Note: The maximum crosswind values given in the above table are recommended values based on computations.

LANDING GEAR

BRAKING SYSTEM

- Not designed to hold the aircraft in a stationary position with high thrust level.
- Max brake temperature for takeoff (fans off): 300°C
- Towing and pushback: Max NWS angle ±95°
- Towbarless towing and pushback: Max NWS Angle ±85°
- Taxing with handwheels: Max NWS ±75°

TAXI WITH DEFLATED TIRES

To vacate the runway/taxi at low speed:

- Max 1 tire per gear deflated (consider three gears): Max taxi speed during turn: 7 knots.
- Two tires deflated on the same main gear (maximum one main gear): Max taxi speed: 3 knots.
- Maximum NWS angle: 30°

TAXI WITH DAMAGED TIRES

If tire damage is suspected:

- Ask for aircraft inspection prior to vacating the runway/taxiway.
- Suspecting that a tire burst may damage the landing gear: Maintenance action is due.

OXYGEN

MINIMUM FLIGHT CREW OXYGEN PRESSURE

See the table given in FCOM LIM-OXY (2nd Last Chapter PDF Page #3995).

GPWS

- Aircraft navigation is not to be predicated on the use of the terrain display.
- For runways not incorporated in the predictive GPWS database:
    - 15 nm short of airfield – TERR Pb OFF
- Procedures identified to cause spurious terrain alerts:
    - 15 nm short of airfield – TERR Pb OFF

NAVIGATION

INERTIAL REFERENCE SYSTEM