Airbus A320-232 Limitations (IAE V2527-A5)

Compiled by Matt Zagoren

SELECTED LIMITATIONS

All references to airspeed or Mach number relate to Indicated Airspeed or Indicated Mach Number, unless otherwise noted. All references to altitude relate to Pressure Altitude, unless otherwise noted.

AVIONICS

Autoland

Autoland is permitted using full flaps only.

Autoland - Maximum Winds

Headwind - 25 kts
Tailwind - 10 kts
Crosswind other than CAT II/III - 15 kts
Crosswind CAT II/III (AFM) - 10 kts

Autopilot Engaged - Minimum Altitude

After Takeoff/Go-Around - 30' AGL
Enroute - 500' AGL
Non-Precision Approaches - 50' Below MDA
Coupled Approaches - 50' AGL
Autoland (One or Two Autopilots) - Touchdown

ILS Approaches (AFM)

Do not arm the ILS APPR mode above 8200' AGL.

Inertial Reference System

In the NAV mode the IRU will not provide valid magnetic heading above 73° North and below 60° South. Flights above/below these latitudes are not permitted.

ENGINES (IAE V2527-A5)

EGT and Thrust - Maximum

	Time Limit (minutes)	Instrument Marking	EGT (°C)
Start	None	Red	635
Takeoff/Go-Around	5	Red	635
Maximum Continuous	Unlimited	Amber	610

Oil Quantity and Consumption (Quarts)

Minimum Before Engine Start (warm)	17.0 + est. consumption
Minimum Before Engine Start (cold/30°C)	10.5 + est. consumption
Minimum When Engine is at Idle rpm	12.0
Estimated Consumption per Hour	.6

Reverse Thrust

Reverse levers must remain in forward thrust range while in flight.
Prohibited for power back on the ground.

RPM - Maximum
N1 - 100%
N2 - 100%

FUEL

Fuel Capacity (pounds)

Outer Wing Tanks	3,100
Inner Wing Tanks	25,000
Center Tank	14,900
Total	43,000

Fuel Imbalance - Maximum
Maximum difference between wing tanks for takeoff and landing - 4410 lbs.

Fuel Temperature
Maximum: 54°C
Minimum: -36°C
If fuel temperature is below minimum temp limit, change to a warmer altitude.

Fuel Usage
Takeoff with center tank supplying the engines is prohibited.

Landing Fuel - Minimum (Pounds)
Fuel At Touchdown: Ensures adequate fuel boost pump coverage during reverse thrust and landing roll.

To Execute Go-Around: The required amount of fuel to execute go-around at runway threshold to 1000' AGL, fly a VFR pattern, intercept a 3° glideslope at approx 2 1/2 miles from the runway and continue to landing.

Fuel Quantity Indicator Error: The maximum design quantity error for all tanks.

Minimum Desired Landing Fuel: Ensures sufficient fuel on board at the threshold in a worst case scenario with max fuel quantity indicator error.

Fuel At Touchdown	400
To Execute Go-Around	800
Fuel Quantity Indicator Error	400
Minimum Desired Landing Fuel (Indicated)	1600

Operating Fuel Values (Pounds)

Taxi Fuel Per Minute (not included in takeoff weight)	25
Minimum for Dispatch (not including taxi fuel)	6800
Minimum Hold for Contingencies (AFM Limit)	1000
Minimum Alternate Fuel	1200
Holding Fuel Per Hour	5000
APU Fuel Per Hour	290

HYDRAULICS

Brake Temperature
Maximum Brake Temperature for Takeoff - 300°C

Flaps/Slats Extended Altitude
Maximum - 20,000 MSL

Speed Brakes (AFM)

IMC	Do not use from FAF inbound.
VMC	Do not use below 1000' AGL.
Inflight With Flaps Retracted	Do not use below 200 KIAS.

ICE AND RAIN

Engine Anti-Ice

- Engine anti-ice must be ON during all ground and flight operations when icing conditions exist or are anticipated, except during climb and cruise when temperature is below -40°C SAT.
- Engine anti-ice must be ON prior to and during descent in icing conditions, including temperatures below -40°C SAT.

Wing Anti-Ice

- Wing anti-ice is not permitted on the ground (AFM), or in flight when TAT exceeds 10°C.
- Use of APU bleed air for wing anti-ice is not permitted.

SPEEDS

Cockpit Window Open Speed
Maximum - 200 KIAS

Design Maneuvering Speeds - Va (KIAS/Mach)

* Only when in alternate or direct flight control laws.								
Speed	Pressure Altitude (1000 Feet)							
	SL	10.0	16.0	20.0	24.0	28.0	30.0	39.0
* Va	248	250	260	270	280	290	295	.78

Flaps/Slat Extended Speeds - Vfe (KIAS)

Config	1	1 + F	2	3	FULL
Vfe	230	215	200	185	177
Slats	18	18	22	22	27
Flaps	0	10	15	20	40
Remarks	Initial Approach	Takeoff	Takeoff/ Approach	Takeoff/Approach Landing	Landing

Takeoff with Flaps 1
When Flaps 1 is selected for takeoff (1 + F), the flaps automatically retract to 0 at 210 KIAS.
Takeoff or Go-Around with Flaps 2 or 3
When Flaps 1 is selected, the 1+F configuration is obtained if airspeed is less than 210 KIAS. The flaps automatically retract to configuration 0 at 210 KIAS.
Flaps Selection in Flight
When the flaps lever is moved from 0 to 1 in flight, only the slats are extended.

Landing Gear Limit Speeds - Vlo/Vle (KIAS/MACH)

Retraction - Vlo	220
Extension - Vlo	250
Extended - Vle	280 / .67
Maximum Tire Speed	195 Knots Groundspeed

Maximum Operating Limit Speeds - Vmo/Mmo

Speed	Pressure Altitude	
	SL - 25,000	25,000 - 39000
Vmo/Mmo	350	.82

Minimum Control Speed Air - Vmca
Vmca - 119 KIAS

Minimum Control Speed Ground - Vmcg
Vmcg - 114 KIAS

Operating Speeds (KIAS/Mach)

Optimum Climb (FMGC Operative)	ECON CLIMB
Standard Climb (FMGC Inoperative) FL 290 and above 10,000' to FL 290	 .78 290
Best Climb Rate	280
Best Climb Angle	220
Optimum Cruise (ECON)	Cost Index = 35
Standard Cruise FL 310 and above 10,000' to FL 310	 .80 300
Optimum Descent (FMGC Operative)	ECON DES
Standard Descent (FMGC Inoperative) 10,000' and above	.78 280

Stall Speeds

Stall speeds apply to takeoff and landing altitudes only.						
Gross Weight (1000 lbs)	Flap Position					
	0	1	1 + F	2	3	FULL
170	179	140	134	125	124	121
160	170	136	130	120	119	117
150	161	132	125	116	115	113
140	154	127	119	112	111	109
130	144	121	115	108	107	105
120	138	116	110	104	103	101
110	132	111	105	99	98	96
100	126	106	100	95	94	92
90	119	100	95	90	89	87
80	114	95	90	85	84	82

Taxi Speed - Maximum

When takeoff weight is higher than 167,550 lbs, do not exceed 20 kts in a turn.

Structural Weights (Pounds)

Maximum Taxi	170,600
Maximum Takeoff	169,750
Maximum Landing	142,200
Maximum Zero Fuel	134,400

GENERAL LIMITATIONS AND SPECIFICATIONS

Center of Gravity Limits
The A320 has two certified CG envelopes. One is a curtailed (normal) envelope with a forward limit of 25%. The other is a full envelope with a forward limit of 15%. Most airplane combinations of fuel and passenger loading will operate in the curtailed envelope. When load planning identifies an aircraft as having a forward CG use the Forward Center of Gravity procedure in the takeoff section.

Flight Load Acceleration Limits (G Load)

Clean Configuration	-1.0 to +2.5
Flaps Retracted and Slats Extended	-1.0 to +2.5
Flaps and Slats Extended	0.0 to +2.0

Pressure Altitude - Maximum
Takeoff and Landing - 8000'
Operating Altitude - 39,100'

Runway Slope
Maximum - +/- 2%

Winds - Maximum (Knots)

The following are the maximum demonstrated crosswinds with flight controls in normal and direct law (with or without the yaw damper).	
Crosswind -Takeoff	29
Crosswind -Landing	33
Crosswind with Gusts	38
Tailwind - Takeoff and Landing	10