Limitations

Table of Contents

General Limitations

- *Certification and operational limitations are conditions of the type and airworthiness certificates and must be complied with at all times as required by law.*

Authorized Operations

- Day
- Night
- VFR
- IFR
- Known icing conditions

Certification Status

- Transport Category (FAR, PART 25)

Documents

- *Display the following documents in the aircraft at all times:*
  - *airworthiness certificate*
  - *registration certificate*
  - *transmitter license(s).*
- *Carry the FAA Approved Airplane Flight Manual in the aircraft at all times.*

Information shown in italics is not included in the AFM Limitations chapter.

Equipment

- *Carry the following equipment in the aircraft at all times:*
  - *microphones and headsets*
  - *flashlight*
  - *first aid kit*
  - *smoke goggles*
  - *oxygen masks.*

Maneuvers

- No acrobatic maneuvers, including spins, are approved.
- No intentional stalls are permitted above 20,000 ft.
- Ditching is not approved for this aircraft under FAR 25.801.

Minimum Flight Crew

- Pilot and Copilot

Crew Seat Shoulder Harness Lock (Optional)

- Use the crew seat shoulder harness lock (locked position) only if the pilot or copilot is incapacitated.

Information shown in italics is not included in the AFM Limitations chapter.

Noise Levels

- *The ICAO Annex 16, Chapter 3, noise values are the same as those for FAR Part 36, Amendment 12, and were obtained with the procedures used to establish compliance with FAR Part 36, Amendment 12. The ICAO Annex 16, Chapter 3, noise levels were obtained by analysis of approved data used to demonstrate compliance with FAR Part 36, Amendment 12, Noise Standards.*
- *This data is applicable only after approval of the Civil Aviation Approving Authority of the country of aircraft registration, including approval of the equivalent procedures used to establish compliance with FAR Part 36, Amendment 12 (**Tables 3-A** and **3-B**, following pages).*
- *No determination has been made by the FAA that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of any airport.*

Seating

- On **units 001 to 104 with Hamilton Standard ECU PACs; 105 and subsequent**, flight above 45,000 ft is prohibited with more than nine passengers on board. No restriction exists on passenger seating during flight at 45,000 ft or below. This limit is due to available airflow on aircraft with Hamilton Standard ECU PACs.
- The maximum seats available are 15 (i.e., pilot, copilot, 13 passengers).
- For all takeoffs and landings, seat belts/shoulder harnesses (if installed) must be in position and fastened, and passenger seats must be in the following positions:
  - all seats fully upright and outboard with headrests fully extended
  - seat backs clear of emergency exits.

Information shown in italics is not included in the AFM Limitations chapter.

Aircraft		Noise Levels (EPNdB)		
		Sideline	Takeoff	Approach
Units 001 to 093 (Not Modified); 001 to 093 with SB650-32-14 (See Table 3-B, Row 1)		92.5	84.9	92.4
Units 001 to 093 with SB650-32-13 and 14 (See Table 3-B, Row 2)		92.5	84.9	92.4
Units 001 to 093 with SB650-32-13, 14, and 15	Configuration A (See Table 3-B, Row 3)	92.9	84.6 (71.6 dB_A)	93.8 (84.8 DB_A)
	Configuration B (See Table 3-B, Row 4)	91.8	79.9 (68.8 DB_A)	90.4 (81.1 DB_A)[1]
Units 094 and Subsequent[2]	Configuration A[3] (See Table 3-B, Row 5)	—	71.6	84.8
	Configuration B[3] (See Table 3-B, Row 6)	—	69.3	81.4
	Certified Noise Levels (See Table 3-B, Row 7)	92.4	80.1	93.8
	Supplemental Noise Levels4 (See Table 3-B, Row 8)	92.9	84.6	90.6

Table 3-A; Effective Perceceived Noise Levels

[1] Configuration B approach provides supplemental noise levels only.

[2] This aircraft complies with FAR Part 36, Stage 3 requirements.

[3] These A-weighted noise levels were established for FAR Part 36 reference conditions.

[4] These noise levels provide information in addition to the certficated noise levels and were obtained by analysis of approved data from actual noise tests; they are within FAR Part 36, Appendix C, Stage 3, noise levels.

NOTE: SB650-32-13; Increased Takeoff and Landing Weight (**units 001 to 093**).

SB650-32-14; Forward Center of Gravity Envelope Expansion (**units 001 to 093**).

SB650-32-15; Main Landing Gear Brake Replacement (**units 001 to 093**).

Row	Sideline/Takeoff					Approach		
	Weight (Lbs)	Climb Speed (KIAS)	Flap Setting	Thrust Reduction Altitude (Ft AGL)	Thrust Reduction From Takeoff N_1 to (% N_1)	Weight (Lbs)	V_{REF}	Flap Setting
1	21,000	140	20°	2,400	87.9	17,000	130	FULL
2	21,500	140	20°	2,400	86.0	19,000	135	FULL
3	21,500	140	20°	2,448	86.0	19,000	130	FULL
4	21,500	150	7°	2,522	80.6	19,000	132	20°
5	22,000	140	20°	2,448	86.0	20,000	130	FULL
6	22,000	150	7°	2,584	81.9	20,000	135	20°
7	22,000	150	7°	2,584	81.9	20,000	130	FULL
8	22,000	140	20°	2,448	86.0	20,000	135	20°

Table 3-B; Effective Perceived Noise Levels – Configurations

Operational Limitations

Altitude Restrictions

Takeoff and Landing Pressure Altitude . . . . . 14,000 FT

Calibrated Operating Altitude . . . . . 51,000 FT

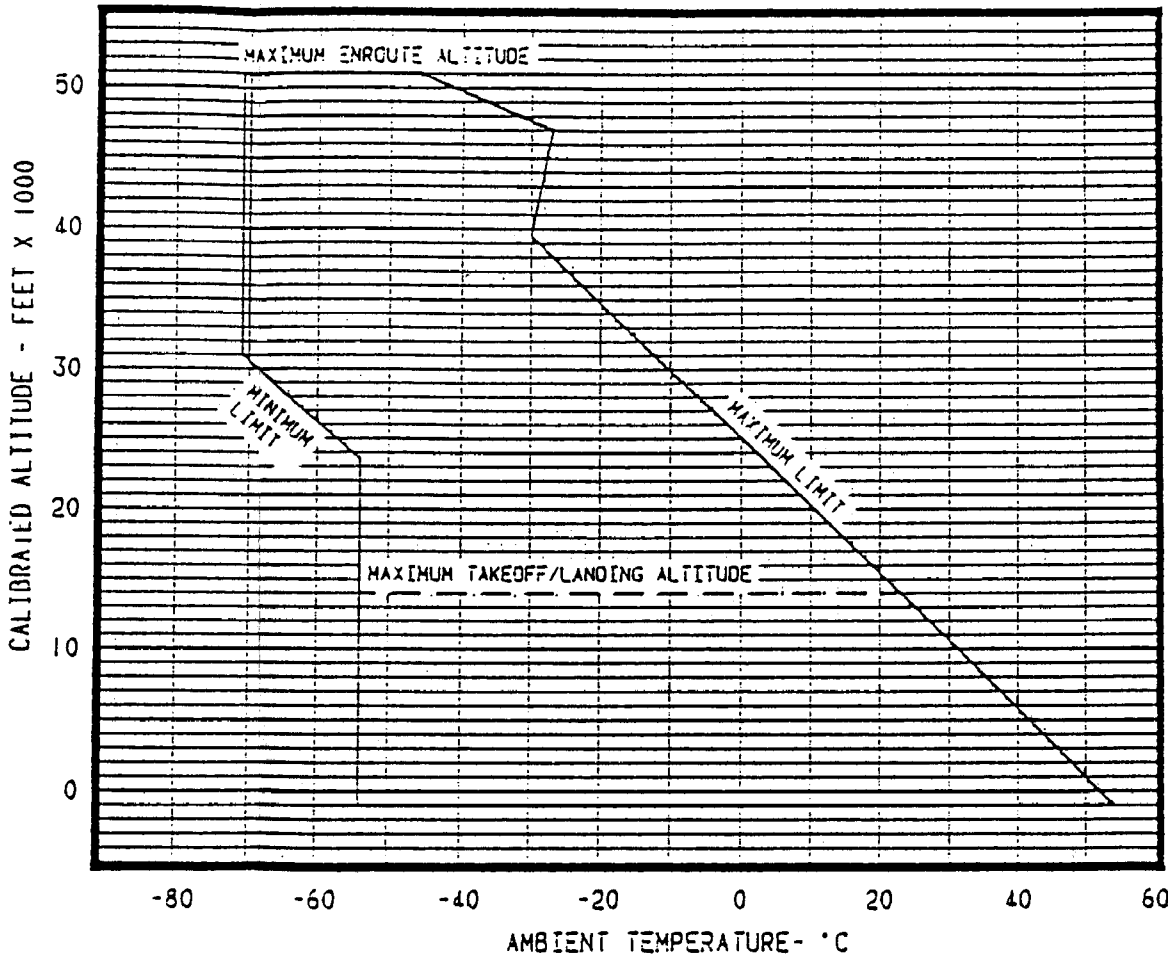
Emergency Pressurization

- For flight above 45,000 ft, both the left and right emergency pressurization systems must be operational, per the preflight test in AFM Section III.

Ambient Temperature Limits

- Observe the limits on **Figure 3-1**, following page.

Ambient Temperature Limits



3-1

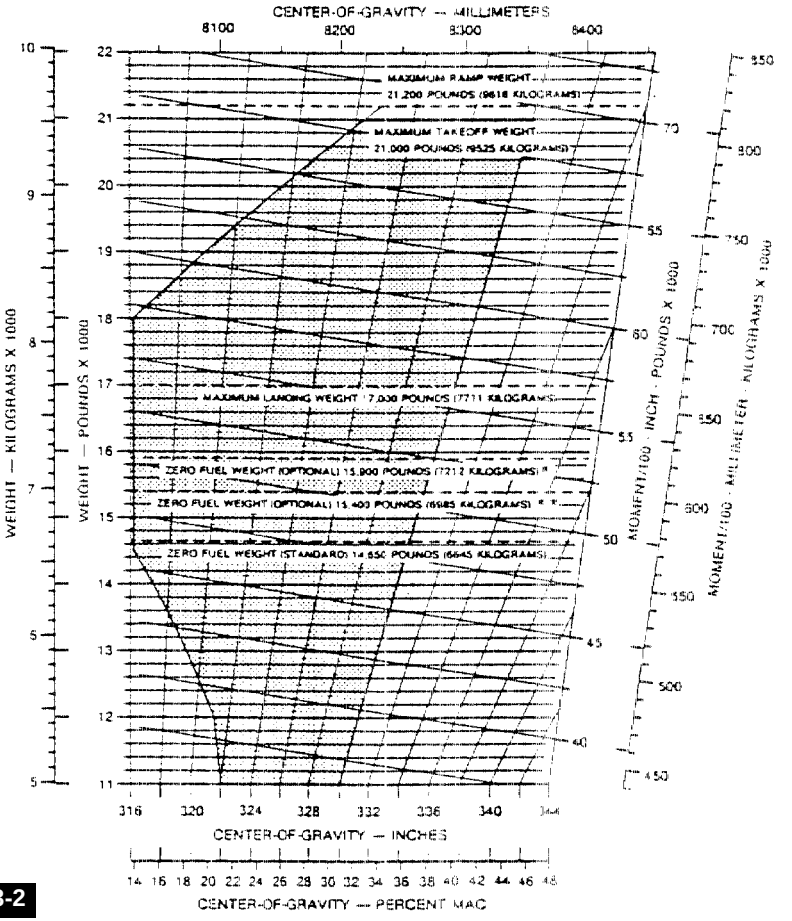
Weight and Balance Limits

- Operate the aircraft in accordance with the approved loading schedule. (Refer to weight and balance data sheets and model 650 Citation III/VI Weight and Balance Manual).

Center-of-Gravity Limits

- Observe the limits depicted in **Figures 3-2, 3-3, 3-4,** and **3-5**, following pages.

Center of Gravity Limits
Units 001 to 093 Without SB650-32-13 and 14



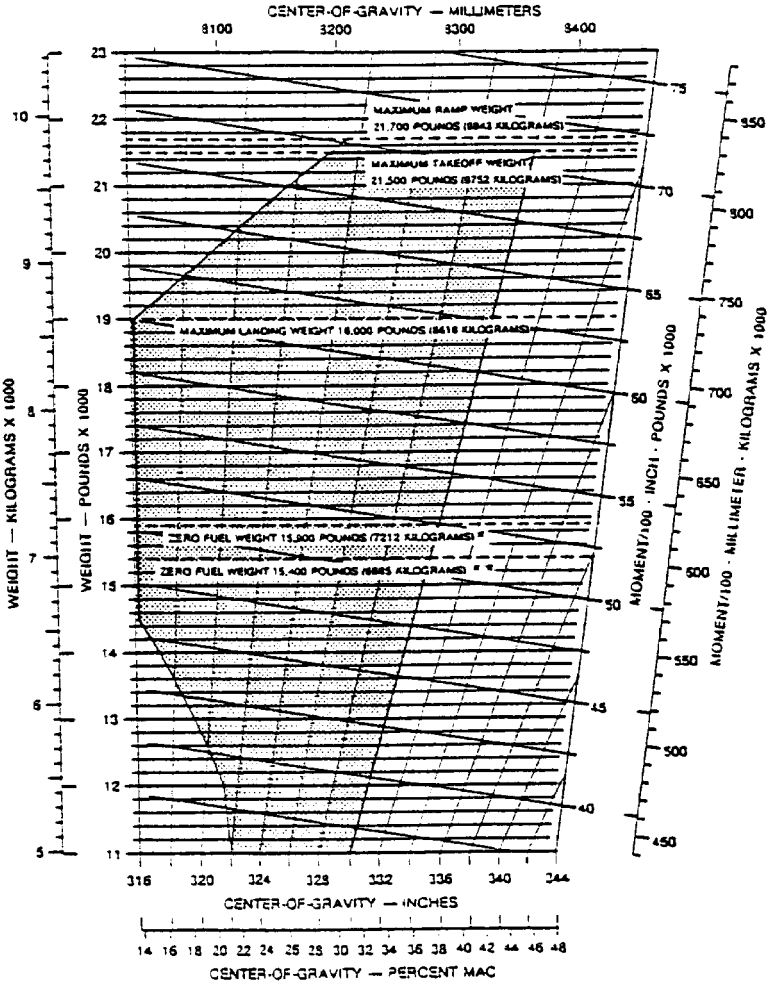
3-2

NOTE: SB650-32-13; Increased Takeoff and Landing Weight (**Units 001 to 093**).

SB650-32-14; Forward Center of Gravity Envelope Expansion (**Units 001 to 093**).

Center of Gravity Limits

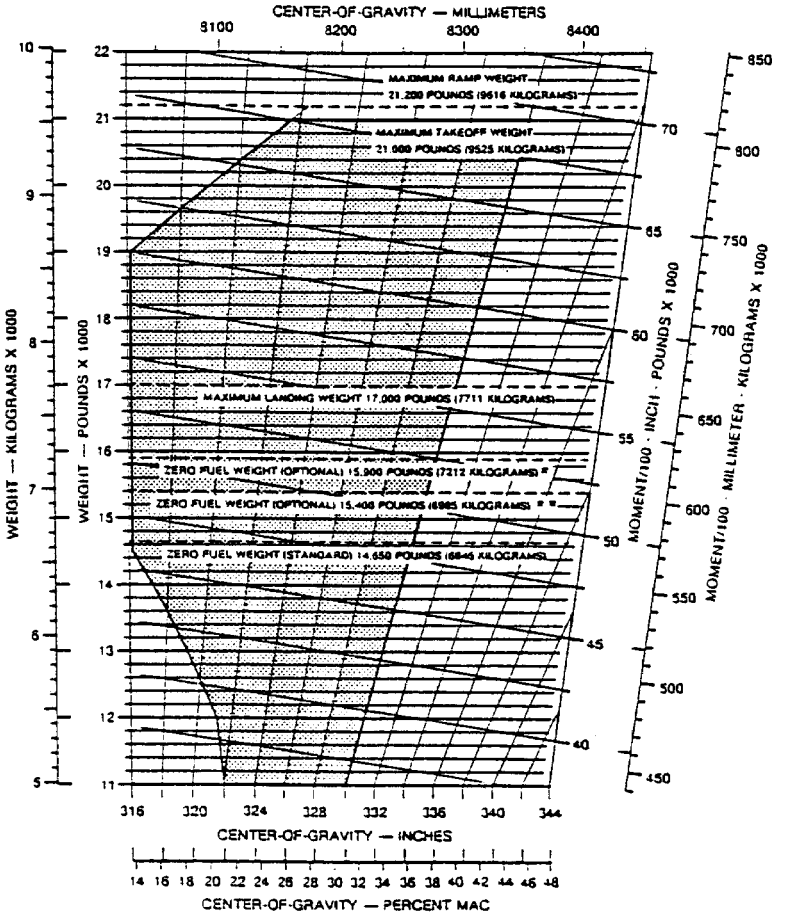
Units 001 to 093 With SB650-32-13 and 14



3-3

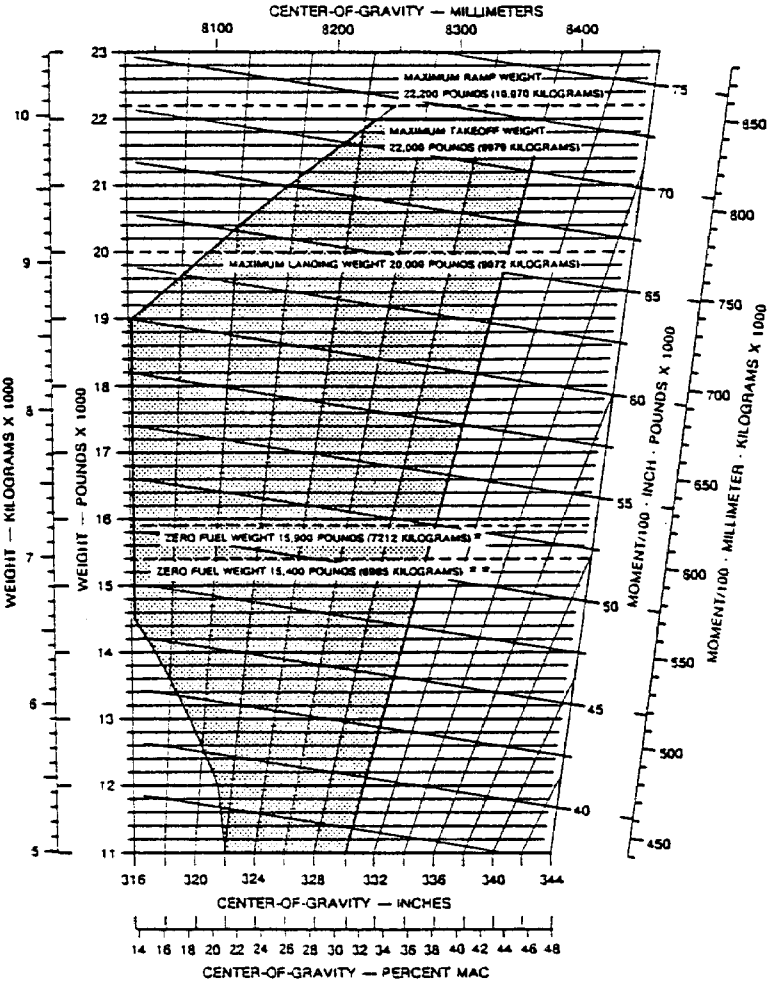
Center of Gravity Limits

Units 001 to 093 Without SB650-32-13 and With SB650-32-14



3-4

Center of Gravity Limits
Unit 094 and Subsequent



3-5

Load Factors

In Flight

Units 001 to 093 Without SB650-32-13:

Flaps UP . . . . . -1.28 TO +3.2G AT 21,000 LBS

Flaps 7° to FULL . . . . . -0.0 TO +2.0G AT 21,000 LBS

Units 001 to 093 With SB650-32-13:

Flaps UP . . . . . -1.0 TO +3.0G AT 21,500 LBS

Flaps 7° to FULL . . . . . 0.0 TO +2.0G AT 21,500 LBS

Unit 094 and Subsequent:

Flaps UP . . . . . -1.0 TO +3.0G AT 22,000 LBS

Flaps 7° to FULL . . . . . 0.0 TO +2.0G AT 22,000 LBS

- *These accelerations limit the angle of bank in turns and limit the severity of pull-up maneuvers.*

Landing

Units 001 to 093 Without SB650-32-13:

Flaps UP, 7°, 20°, or FULL . . . . . +3.5G AT 17,000 LBS

Units 001 to 093 With SB650-32-13:

Flaps UP, 7°, 20°, or FULL . . . . . +3.5G AT 19,000 LBS

Unit 094 and Subsequent:

Flaps UP, 7°, 20°, or FULL . . . . . +3.5G AT 20,000 LBS

- *These accelerations limit the landing gear during ground contacts.*

Information shown in italics is not included in the AFM Limitations chapter.

Performance Configurations

- *Configurations in performance charts correspond to the settings shown in **Table 3-C**.*

Segment	No. of Engines Operating	Thrust	Flap Setting	Gear
First Segment Takeoff Climb	1	Takeoff	7° or 20°	DOWN
Second Segment Takeoff Climb	1	Takeoff	7° or 20°	UP
Third Segment Horizontal Acceleration	1	Takeoff (5 min. maximum) then maximum continuous single engine thrust	7° or 20° to UP	UP
Enroute Climb	1	Maximum continuous single engine thrust	UP	UP
Approach Climb	1	Takeoff	7° or 20°	UP
Landing Climb	2	Takeoff	20° or FULL	DOWN

Table 3-C; Performance Configurations

Information shown in italics is not included in the AFM Limitations chapter.

Speed Limits

V_A, Maximum Maneuvering:

- Observe the limits shown in **Figure 3-6**, page 3-21, **Figure 3-7**, page 3-23, and **Figure 3-8**, page 3-25.
- Confine full application of rudder and aileron controls as well as maneuvers that involve angles-of-attack near the stall to speeds below maximum maneuvering speed.

V_{FE}, Maximum Flaps Extended:

Full Flaps (FULL) . . . . . 170 KIAS

Partial Flaps (7° or 20°) . . . . . 210 KIAS

V_{LO}, Maximum Landing Gear Operating . . . . . 210 KIAS

V_{MCA}, Minimum Control – Air . . . . . 98 KIAS

V_{MCG}, Minimum Control – Ground:

19,000 Lbs and Below . . . . . 99 KIAS

20,000 Lbs . . . . . 103 KIAS

21,000 Lbs . . . . . 108 KIAS

21,500 Lbs . . . . . 111 KIAS

22,000 Lbs . . . . . 113 KIAS

V_{MO}/M_{MO}, Maximum Operating:

- See **Table 3-D**.
- Do not exceed the maximum operating limit speeds in any regime of flight (climb, cruise, or descent) unless a higher speed is authorized for flight test or pilot training.

Zero Fuel Weight (ZFW)	14,650 lbs[1]	15,900 lbs or 15,400 lbs [2,3]
V_{MO}	305 KIAS (Below 8,000 Ft)	305 KIAS (Below 8,000 Ft)
	346 to 293 KIAS[4] (8,000 to 34,275 Ft)	336 to 278 KIAS[4] (8,000 to 36,524 Ft)
M_{MO}	0.851M (Above 34,275 Ft)	0.851M (Above 36,524 Ft)

Table 3-D; V_{MO}/M_{MO} Limits

[1] Units 001 to 093 without SB650-32-13.

[2] Units 001 to 093 with SB650-32-13, 094 and subsequent; units 179 to 199 and 203 to 206 with 15,400 lbs zero fuel weight and dual digital air data computers with SB650-34-64.

[3] With 400 lbs or less fuel in the fuselage tank, the maximum design zero fuel weight is 15,900 lbs. With more than 400 lbs in the fuselage tank, the maximum design zero fuel weight is 15,400 lbs.

[4] Linear decrease between.

NOTE: SB650-32-13; Increased Takeoff and Landing Weight (**Units 001 to 093**).

SB650-34-64; Alternate V_{MO} Schedule Select Switch Installation (**Units 179 to 199 and 203 to 206**).

V_{SB}, Speedbrake Extension:

Maximum . . . . . NO LIMIT

Minimum . . . . . V_{REF} + 15 KIAS

Maximum Landing Light Extend Speed . . . . . 250 KIAS

Maximum Tire Ground Speed . . . . . 165 KTS

Spoiler Extension Speed in Emergency Descent:

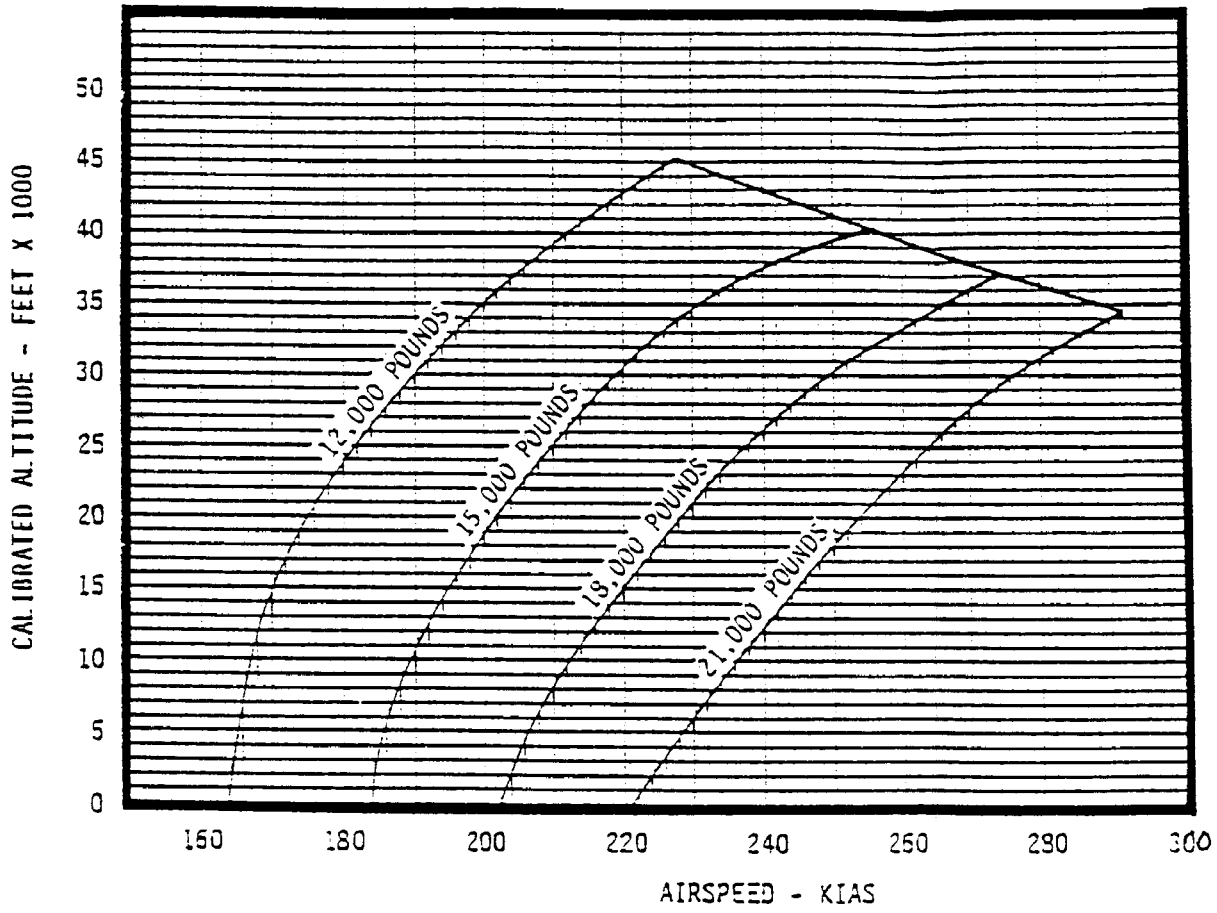
Maximum . . . . . V_{MO}/M_{MO}

Minimum . . . . . 150 KIAS

- Extend spoilers in flight only as part of an emergency descent.

V_A, Maximum Maneuvering Speed

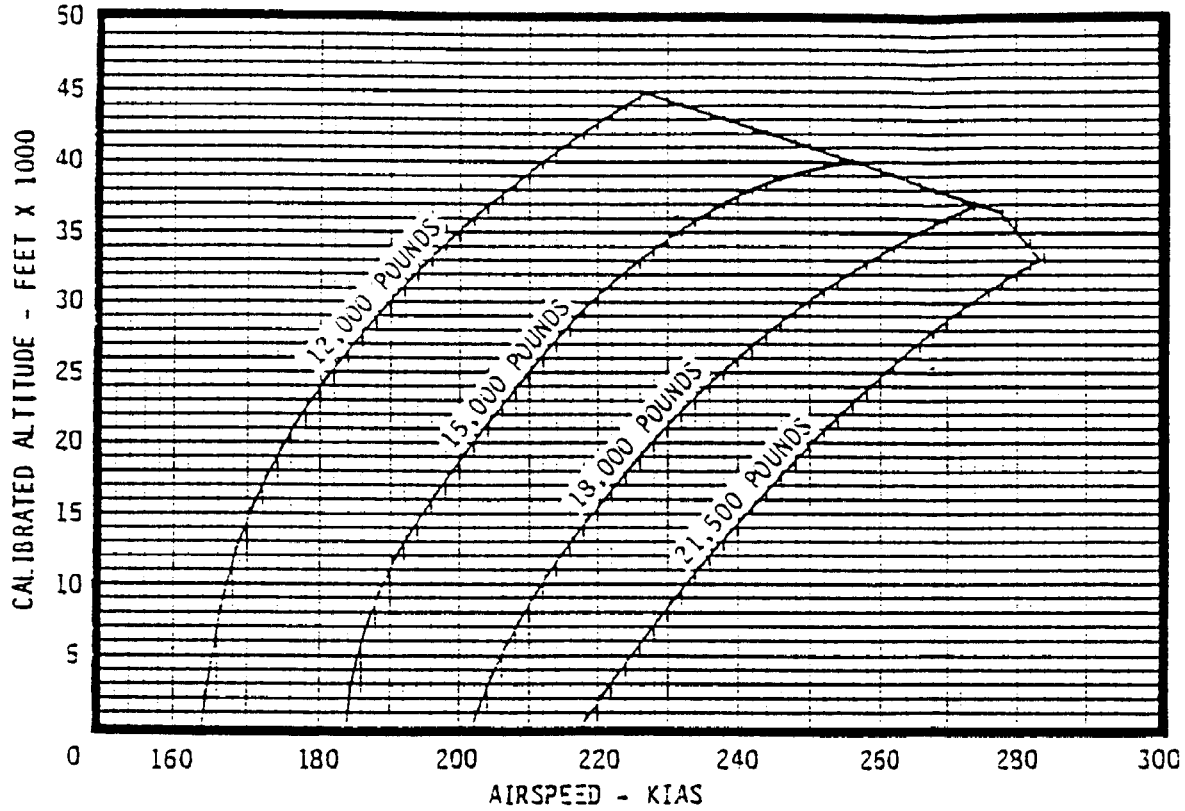
Units 001 to 093 Without SB650-32-13



3-6

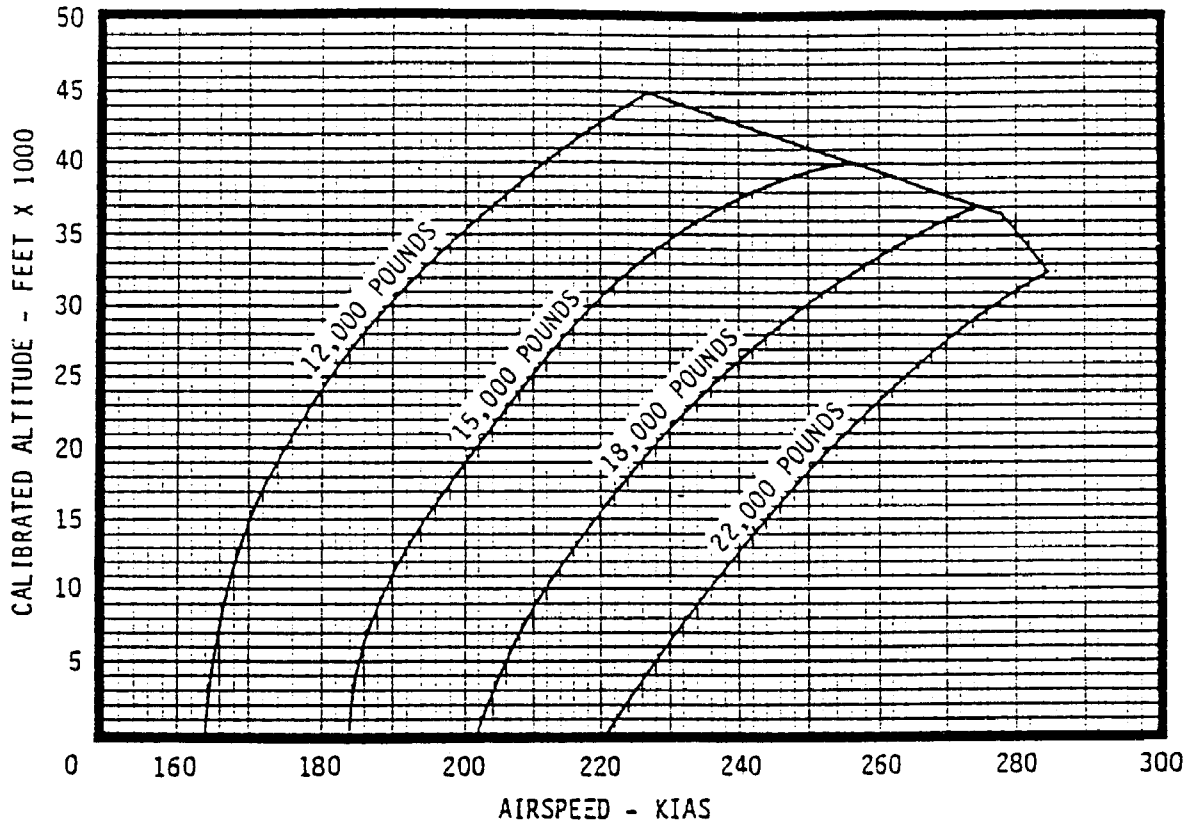
V_A, Maximum Maneuvering Speed

Units 001 to 093 With SB650-32-13



3-7

V_A, Maximum Maneuvering Speed
Unit 094 and Subsequent

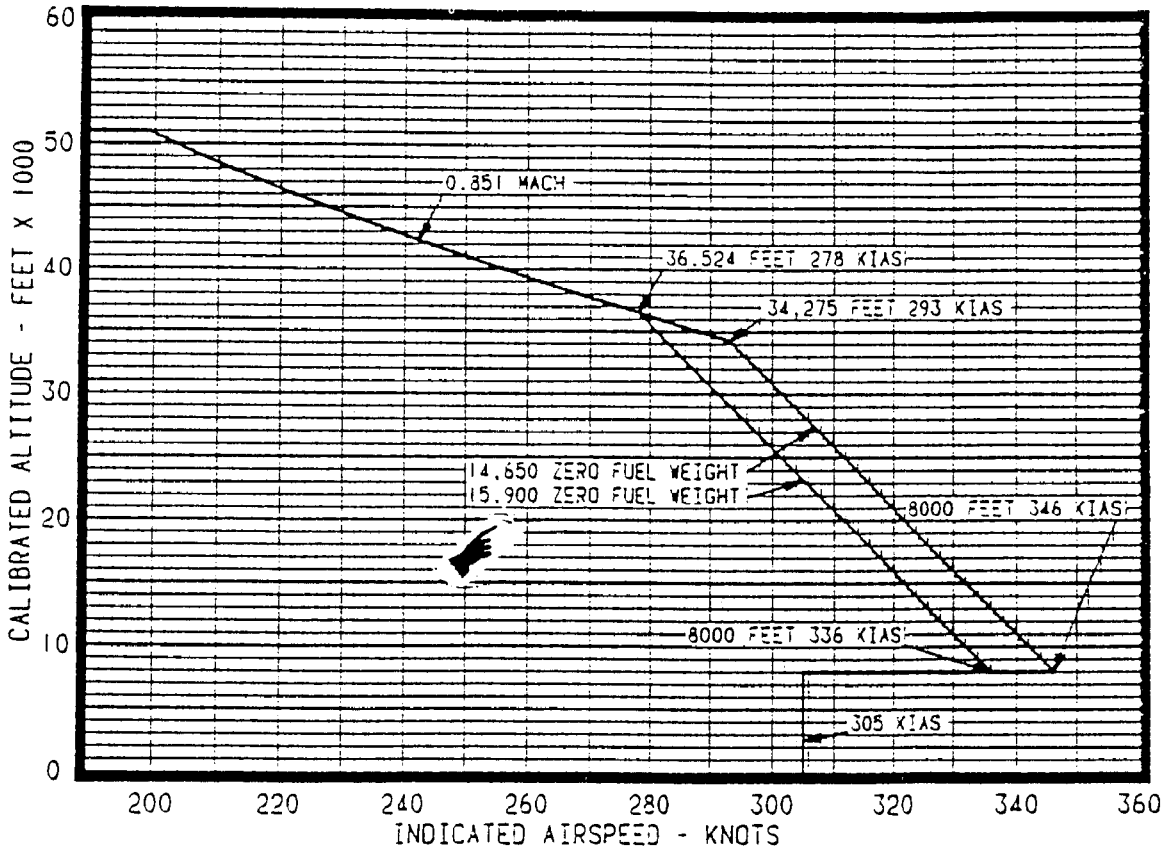


3-8

Design Speed Envelope

With and Without Increased Zero Fuel Weight

- Observe the limits on **Figure 3-9**.



3-9

Maximum Design Weights

Ramp

Units 001 to 093:

Without SB650-32-13 and 32-14 or
With SB650-32-14 Only . . . . . 21,200 LBS

With SB650-32-14 . . . . . 21,200 LBS

With SB650-32-13 and 32-14 . . . . . 21,700 LBS

Unit 094 and Subsequent . . . . . 22,200 LBS

Takeoff

Units 001 to 093:

Without SB650-32-13 and 32-14 or
With SB650-32-14 Only . . . . . 21,000 LBS

With SB650-32-13 and 32-14 . . . . . 21,500 LBS

Unit 094 and Subsequent . . . . . 22,000 LBS

- Takeoff weight is limited by the most restrictive of the following:
  - maximum certified takeoff weight
  - maximum takeoff weight permitted by climb requirements
  - takeoff field length.

Landing

Units 001 to 093:

Without SB650-32-13 and 32-14 or
With SB650-32-14 Only . . . . . 17,000 LBS

With SB650-32-13 and 32-14 . . . . . 19,000 LBS

Unit 094 and Subsequent . . . . . 20,000 LBS

- Landing weight is limited by the most restrictive of the following:
  - maximum certified landing weight
  - maximum landing weight permitted by climb requirements or brake energy limit
  - landing distance.

Zero Fuel

Units 001 to 093:

Without SB650-32-13 and 32-14 or
With SB650-32-14 Only (standard) . . . . . 14,650 LBS

Without SB650-32-13 and 32-14 or With SB650-32-14 Only (optional):

400 Lbs or Less in Fuselage Fuel Tank . . . . . 15,900 LBS

Greater than 400 Lbs in Fuselage Fuel Tank . . 15,400 LBS

With SB650-32-13 and 32-14:

400 Lbs or Less in Fuselage Fuel Tank . . . . . 15,900 LBS

Greater than 400 Lbs in Fuselage Fuel Tank . . 15,400 LBS

Unit 094 and Subsequent:

400 Lbs or Less in Fuselage Fuel Tank . . . . . 15,900 LBS

Greater than 400 Lbs in Fuselage Fuel Tank . . 15,400 LBS

Takeoff and Landing Operational Limits

Altitude (Takeoff and Landing)

Maximum . . . . . 14,000 FT

Anti-Skid

- Anti-skid must be operational for takeoff.

Approach Flap Setting

- Limit approach flap setting to:
  - 7° when landing is scheduled using the 20° flaps
  - 20° when landing is scheduled using the FULL flaps.

Contaminated Runways

- *See **Table 3-E** for takeoff and landing adjustments.*

Crosswind Component (Maximum Demonstrated)

Without T/R Deployment (not limiting) . . . . . 25 KTS

With T/R Deployment (limiting) . . . . . 25 KTS

Ailerons Only (roll spoilers inoperative) . . . . . 10 KTS

Tailwind Component (Maximum)

Wind Speed . . . . . 10 KTS

Vortex Generators

- Do not take off with more than one vortex generator per wing missing.

Water/Slush on Runway

Maximum Contaminant . . . . . 0.75 INCH

Information shown in italics is not included in the AFM Limitations chapter.

Aircraft	Adjustment	Less than 0.01" Water	Less than 0.4" Water	Less than 0.4" Slush	Less than 1.0" Loose, Dry Snow	Ice (Dry)
Units 001 to 093 Without SB650-32-13, 14, or 15	Flight Manual V_1 Adjustment (KIAS) [1,3]	0	+3	+3	+3	Unknown
	Multiply Takeoff Field Length by: [3]	1.35	2.35 [5]	2.30 [6]	2.50 [7]	Unknown
	Multiply Landing Distance by: [4]	1.40	2.05	1.95	2.40	2.50
Units 001 to 093 With SB650-32-14 Units 001 to 093 With SB650-32-13 and 14	Flight Manual V_1 Adjustment (KIAS) [1,3]	0	+3	+3	+3	Unknown
	Multiply Takeoff Field Length by: [3]	1.30	2.30 [5]	2.30 [6]	2.50 [7]	Unknown
	Multiply Landing Distance by: [4]	1.40	2.00	1.95	2.35	2.40
Units 001 to 093 With SB650-32-13, 14, and 15 Unit 094 and Subsequent	Flight Manual V_1 Adjustment (KIAS) [1,3]	0	+3	+3	+3	Unknown
	Multiply Takeoff Field Length by: [3]	1.30	2.30 [5]	2.30 [6]	2.50 [7]	Unknown
	Multiply Landing Distance by: [4]	1.40	2.25	2.05	2.45	2.40

Table 3-E; Contaminated Runway Takeoff and Landing Adjustments

[1] If the adjusted V_1 is greater than V_R, the value of V_R must be used for V_1.

[2] Avoid takeoffs and landings with actual headwinds exceeding 20 kts or actual tailwinds exceeding 10 kts.

[3] Determine normal 20° flap takeoff V_1 speeds and takeoff field lengths from the AFM. Do not use takeoff field lengths for other flap settings or with anti-ice systems on.

[4] The published limiting maximum tailwind component for this aircraft is 10 kts; however, the manufacturer does not recommend landings on precipitation-covered runways with any tailwind component. If a tailwind landing cannot be avoided, add 0.20 to all landing factors. Determine normal full flaps landing distances from the AFM. Do not use landing distance for other flap settings.

[5] Do not attempt takeoffs in headwinds exceeding 10 kts with this condition. Do not attempt takeoffs in water depths greater than 0.4 inches.

[6] Do not attempt takeoffs in slush depths greater than 0.4 inches. Do not attempt takeoffs in slush with headwinds exceeding 10 kts.

[7] Do not attempt takeoffs in snow depths greater than 1.0 inch. Do not attempt takeoffs in snow at altitudes above 5,000 ft.

NOTE: SB650-32-13; Increased Takeoff and Landing Weight (**Units 001 to 093**).

SB650-32-14; Forward Center of Gravity Envelope Expansion (**Units 001 to 093**).

SB650-32-15; Main Landing Gear Brake Replacement (**Units 001 to 093 with SB650-32-13**).

Seating

- The maximum number of seats is 15 (two pilots and 13 passengers).
- For all takeoffs and landings, seat belts/shoulder harnesses (if installed) must be in position and fastened, and passenger seats must be in the following positions:
  - all seats fully upright and outboard with headrests fully extended
  - seat backs clear of emergency exits.

Takeoff Limits

- Takeoff shall not exceed the weight, altitude, temperature, and runway gradients, or any combination thereof, contained in the AFM or Operating Manual.

Wing Vortex Generators

- Of the eleven vortex generators on each wing, no more than one may be missing from either wing to dispatch for flight.

Systems Limitations

Avionics and Communication

Angle-of-Attack System

- The angle-of-attack indicating system may be used as a reference but does not replace the airspeed indicator as a primary instrument.
- The angle-of-attack system is calibrated for accuracy in the 20° flap position (approach and landing configurations) and FULL flap landing configuration.

High Frequency Communication Interference

- Disregard the ADF bearing and left and right engine oil pressure indications during periods of HF transmission.
- Disregard the weather radar display during periods of transmission in the 29.0 MHz frequency band and above.

Honeywell Primus II SRZ-850 Integrated Radio System (if installed)

On **unit 179 and subsequent**:

- The Honeywell Pilot's Operating Handbook, SRZ-850 (Publication Number 21-1146-50-01 dated June 1988 or later revision) must be immediately available to the flight crew.
- The STANDBY COMM 1/NAV 1 control display unit must be installed and operational.

Honeywell SPZ-650 Flight Control System (Autopilot)

- One pilot must remain in his seat with seat belt and shoulder harness fastened during all autopilot operations.
- The Honeywell SPZ-650 autopilot must remain off until satisfactory operation is verified per the preflight test in the AFM.
- Operation of the Honeywell SPZ-650 IFCS autopilot is prohibited if the autopilot torque light is illuminated.

- Aileron boost inoperative or off restricts autopilot operation to the following modes:
  - heading select
  - altitude hold
  - basic autopilot.
- Manual engagement of altitude hold is prohibited when the aircraft descent rate is greater than 5,500 fpm.
- The autopilot and yaw damper must be off during takeoff and landing.
- The autopilot must be off at 200 ft AGL (Category I only).

Honeywell EDZ-600 Electronic Flight Instrument System (EFIS)

- The Honeywell Pilot's Operating Handbook must be immediately available to the flight crew for aircraft equipped with the EDZ-600/800, EDZ-601/801, or EDZ-603/803. See AFM Supplements, Section V for publication numbers.
- Category II operations are approved for the pilot's and copilot's flight directors. See AFM Supplement 22.
- Operating in the composite mode (REV selected) is approved only with the flight director (single cue or crosspointer) selected.
- Limit EFIS ground operation with either EFIS FAN annunciator illuminated to 10 minutes or until either the EADI HOT or EHSI HOT annunciator illuminates, whichever occurs first.
- Dispatch is prohibited if any EADI HOT or EHSI HOT annunciator illuminates.

- Dispatch is prohibited if both EFIS FAN annunciators illuminate. Dispatch is allowed, however, in visual meteorological conditions with one EFIS FAN (pilot or copilot) illuminated, provided the EFIS FAN Light Illuminated on Ground abnormal procedures are followed.
- Dispatch is prohibited following a flight where either an EADI HOT or EHSI HOT annunciator illuminates until the condition is identified and corrected.
- Both the pilot and copilot EADIs and EHSIs must be installed and operational in the normal (non-reversionary) mode for takeoff.
- The EDZ-6XX system must be verified to be operational by a satisfactory preflight test as contained in the normal procedures.
- "T" speed display in the EADI (EDZ 603/803 only) may be used for reference but does not replace the airspeed indicator as a primary instrument.

Honeywell SPZ-8000 Avionics System (with or without optional MDZ Multifunction Display)

- Crew qualification is required to conduct Category II approaches. Refer to AFM Supplement 40, Sperry SPZ-8000 Avionics System Category II.

On **unit 179 and subsequent**, the following limitations apply.

- The following Honeywell Pilot Manual must be immediately available to the flight crew: SPZ-8000 Digital Integrated Flight Control System for the Citation III (Publication Number 28-1146-45-00, dated January 1987 or later revision).
- Dispatch is approved with any combination of two of the following symbol generators (SG) operational: pilot's SG, copilot's SG, MFD SG. The hot annunciator associated with the two operational symbol generators must be extinguished.

- Dispatch with an EFIS FAN annunciator illuminated is allowed in visual meteorological conditions when the Fan Light Illuminated on Ground abnormal procedures are followed. Dispatch with an EFIS FAN annunciator illuminated is prohibited under all other circumstances.
- Verify that the following systems are operational per the AFM Normal procedures test:
  - AHRS auxiliary battery (AHRS AUX PWR annunciator)
  - EDZ-8XX EFIS system.
- Ground operation with either the pilot's or copilot's EFIS FAN or MDS FAN annunciator illuminated is limited to 10 minutes.
- Both the pilot's and copilot's EADIs and EHSIs must be installed and operational in the normal (Non-Composite) mode for takeoff.
- The flight director is approved for Category I operations only.
- Flight director and autopilot coupled Category II operations are approved.
- The autopilot must be off at 200 ft AGL (Category I).
- Movement of the aircraft is prohibited until the AHRS ground alignment is complete (approximately three minutes).
- When operating in the Composite mode, the flight director must be selected.
- When operating with standby airspeed indicator, do not exceed the following V_{MO} airspeeds.

  Sea Level to 35,000 Ft . . . . . 275 KIAS

  35,000 Ft to 45,000 Ft . . . . . 225 KIAS

  45,000 Ft to 51,000 Ft . . . . . 199 KIAS

- Approaches using VOR MAP display are prohibited.
- “T” SPEED display in the EADI may be used for reference but does not replace the airspeed indicator as a primary instrument.

Radio Altimeter

- The radio altimeter must be on, operative, and tested to dispatch with 7° flap takeoff performance or to land using 20° flap landing performance.

Standby Attitude Indicator

- An operative standby altitude indicator is required. Verify the standby attitude indicator is operational per the preflight test in AFM Section III.

Standby Magnetic Compass

- The error in the standby magnetic compass reading is greater than 10° with the landing lights on.

Vertical Navigation (VNAV)

- VNAV operation below 500 ft AGL is prohibited.

Electrical (and Lighting)

Avionics AC Power Distribution System

- For takeoff, verify the avionics AC power distribution is operational per the preflight test in AFM Section III.

Battery

- Verify the battery temperature warning system is operational for all ground and fight operations per the preflight test in AFM Section III.
- If the BATT O'TEMP light illuminates during ground operation, do not takeoff until after accomplishing the proper battery maintenance procedures.
- Three engine starts per hour are permitted.
- *If more than three engine starts are conducted in a one-hour period, accomplish a deep cycle that includes a capacity check to detect possible cell damage.*
- *Three generator-assisted cross-starts equal one battery start.*
- *A ground external power unit start does not count as a battery cycle.*
- *If the optional onboard APU is running, ensure the APU generator is off the preflight battery check.*

Dual Generator Output

Up to 41,000 Ft 300A

Above 41,000 Ft 250A

Above 47,000 Ft 200A

Information shown in italics is not included in the AFM Limitations chapter.

Single Generator Output

Up to 25,000 Ft 365A

Above 25,000 Ft 300A

Above 41,000 Ft 250A

Above 47,000 Ft 200A

Starter/Generator

- Three engine starts per 30 minutes are permitted.
- Three cycles of operation are permitted with a one-minute rest period between cycles.
- The starter/generator is limited to 365A for takeoff and 300A for all other ground operations.
- *Starter cycle limits are independent of starter power source (i.e., battery, generator-assisted cross-start, external power unit).*
- *Use of a ground external power source with voltage in excess of 28V DC or current in excess of 2,000A may damage the starter.*

Information shown in italics is not included in the AFM Limitations chapter.

Environmental Systems

Emergency Pressurization

- Both the left and right emergency pressurization systems must be operational, per the preflight test in AFM Section III, for flight above 45,000 ft.

Cabin Differential

Normal Cabin Pressure . . . . . 0.0 TO 9.7 PSID

PAC Selector Switches (Cockpit and Cabin)

- Operation in HIGH (flow) mode is not approved for takeoff and landing and flight above 45,000 ft.
- Operation in HIGH (flow) mode is not approved during normal operation when any of the following systems are on:
  - windshield bleed air
  - wing anti-ice
  - engine anti-ice.
- During emergency operations, HIGH (flow) mode is approved when the bleed air anti-ice systems are on.
- Operation in HIGH (flow) mode is not approved above 25,000 ft when the isolation valve is open and either left or right engine bleed air switch is off.

PAC Bleed Air Select Switch

- Operation in HP mode (high pressure bleed air – PAC HP VLV OPEN light illuminated) is not approved for normal take-off and landing operations.
- Operation in HP mode (high pressure bleed air – PAC HP VLV OPEN light illuminated) is prohibited when any of the following systems are on:
  - windshield bleed air
  - wing anti-ice
  - engine anti-ice.
- The PAC BLD SELECT switch must be in NORM or HP for flight above 45,000 ft.

Approved Oils – Environmental Control Unit (PACs)

- See Servicing chapter.

Flight Controls

Aileron Boost

- Aileron boost inoperative or off restricts autopilot operation to the following modes:
  - Heading Select
  - Altitude Hold
  - Basic Autopilot.
- The aileron boost system must remain off until it is verified operational per the preflight test in AFM Section III.

Flaps

- *After landing on runways covered with snow or slush, do not retract flaps to UP until an inspection verifies flap tracks are free of snow or slush accumulation.*
- Flap extension is prohibited above 20,000 ft.

Rudder Bias

- The rudder bias system must be on and operative for take-off.
- Verify the rudder bias heater is operational per the preflight test in AFM Section III.

Speedbrake/Spoiler System

- The speedbrake/spoiler system must be operational and verified by the preflight test in AFM Section III.
- Restrict spoilers to emergency descent and ground operation only.
- Spoiler extension is prohibited in flight with flaps in any position other than UP.

Information shown in italics is not included in the AFM Limitations chapter.

- On **units 001 to 151 without SB650-27-23**, extension of the speedbrakes is prohibited in flight with flaps in any position other than UP.
- On **units 001 to 151 with SB650-27-23; unit 152 and subsequent**, speedbrake extension with the flaps in any position other than UP is prohibited below 500 ft AGL. Above 500 ft AGL, the speedbrakes may be extended with the flaps in any position.
- The roll control spoilers must be operational and verified by the preflight test in AFM Section III.

Stabilizer Takeoff Trim

- Set the stabilizer takeoff trim per the Primary Trim Takeoff Setting vs. Airplane Center-of-Gravity chart in AFM Section IV.

Stabilizer Trim Systems

- Verify the primary and secondary stabilizer trim system is operational per the preflight check in AFM Section III.

Stall Warning System

- Verify the stall warning system is operational for takeoff per the preflight test in AFM Section III.

Takeoff Flap Setting

- On **units 001 to 093 without SB650-32-13 and SB650-32-14**, takeoff with 7° flaps is not approved with the CG forward of 23.89% MAC at 21,000 lbs and 14% MAC at 18,000 lbs; there is a straight line variation between these points.

Fuel

Approved Fuels

- Fuels that conform to specifications of the following (including equivalent NATO fuels) are approved for use.
  - ASTM D1655 Jet A, A-1
  - MIL-T-83133 (JP-8)
  - ASTM D1655, Jet B (JP-4)
  - MIL-T-5624 (JP-4 and JP-5)
- Mixing of fuels is permissible, JP-4, JP-5, and JP-8 fuels contain factory-blended anti-icing additive (**Table 3-F**).

Condition	Jet A JP-5	Jet A-1 JP-8	Jet B JP-4
Fuel Temperature (Start, Takeoff, Enroute)	-31 to +46°C	-43 to +46°C	-50 to +42°C
Minimum Enroute Fuel Temperature (Engine Fuel Computer Manual Mode)	-31°C	-43°C	-50°C
Maximum Altitude	51,000 ft	51,000 ft	45,000 ft[1]
Maximum Assymetric Fuel	200 lbs	200 lbs	200 lbs
Emergency Assymetric Fuel	800 lbs	800 lbs	800 lbs
Fuel Computer Setting[2]	5	5	5
Minimum Fuel per Tank for Takeoff[3]	350 lbs	350 lbs	350 lbs

Table 3-F; Fuel Limitations

[1] When using Jet B or JP-4 fuel at 45,000 to 51,000 ft, fuel temperature must not exceed 13°C.

[2] Position numbers are not on control; count detents clockwise.

[3] When operating in low fuel configuration, operate the fuel boost pumps or engines for three minutes prior to obtaining initial fuel quantity readings for takeoff.

Fuel Additives

- *Although the use of anti-ice additive is not necessary for icing conditions on aircraft equipped with fuel heaters, its use is recommended for non-treated fuel to control bacteria and fungi.*
- *The approved anti-ice additive is biocidal, which controls micro-organisms such as rapidly multiplying bacteria and fungi. These micro-organisms can cause serious corrosion in tanks and may block filters, screens, and fuel metering equipment.*
- See the Servicing chapter for more information on fuel additives.

WARNING: Anti-icing additives containing ethylene glycol monomethyl ether (EGME) cause eye irritation and are harmful if inhaled, swallowed, or absorbed through the skin. EGME is combustible. Before using this material, refer to all safety information on the container.

Ballast (Unusable) Fuel

- Ballast fuel is that remaining in the wing fuel tanks that cannot be used without exceeding the aft CG limit; ballast fuel is nonusuable fuel. Determine ballast fuel requirements prior to flight.

Fuel Capacity

Maximum Usable . . . . . APPROXIMATELY 7,384 LBS (1,095 GALLONS)

Information shown in italics is not included in the AFM Limitations chapter.

Fuselage Fuel Tank/Transfer

- The fuselage fuel tank unusable quantity is 3.0 lbs.
- The fuselage fuel tank may be filled, provided the wing fuel quantity is 2,500 lbs (or greater) per side (5,000 lbs minimum total wing fuel).
- The fuselage fuel tank transfer must be starter at or prior to the wing fuel quantity reaching 2,500 lbs per side (5,000 lbs total wing fuel).
- To preclude pump cavitation and ensure proper fuselage fuel tank transfer, switch on the transfer pumps prior to 30,000 ft.
- *For the wing tanks to accommodate the fuselage tank fuel, it is recommended that fuel transfer not be started until fuel in each wing tank is reduced to approximately 2,900 lbs.*
- On **units 001 to 093 with SB650-32-13; unit 094 and subsequent**, maximum fuselage fuel quantity is limited to 400 lbs when the zero fuel weight is greater than 15,400 lbs. No limitation exists when the zero fuel weight is 15,400 lbs or less.

Single Point Refueling

- Accomplish single point refueling operations per the procedures contained on the placard on the single point refueling access door.

Unusable Fuel

- Fuel remaining in the fuel tanks when the fuel quantity indicator reads zero is not usable in flight.

Wing Tank Fuel Transfer

- Boost pump on the receiving tank must be off during wing tank fuel transfer.

Information shown in italics is not included in the AFM Limitations chapter.

Hydraulics

Approved Hydraulic Fluid/Capacity

- Hydraulic fluid per MIL-H-83282 with a system capacity of 6.58 quarts.

Hydraulic Pressure – Ground Operations

- *The hydraulic pressure may operate in the yellow arc during single engine ground operations when the turbine RPM (N_2) is less than 65%.*

Information shown in italics is not included in the AFM Limitations chapter.

Ice and Rain Protection

Alcohol

- The aircraft must leave icing conditions within 15 minutes after the windshield alcohol is turned on.
- Use TT-I-735 isopropyl alcohol for windshield anti-ice.

Alcohol Reservoir Capacity

Capacity . . . . . 2 QUARTS

Engine Ice Protection

- All of the following engine ice protection systems must be operating to provide a satisfactory level of protection:
  - pitot heaters
  - windshield bleed air system
  - wing leading edges
  - engine bleed air heated inlets.
- Turn on all anti-ice systems when operating in visible moisture and when the total air temperature (TAT/RAT) is between +10 and -30°C (ground and flight operations).
- Utilize all anti-ice systems during ground operations when OAT is between +10 and -30°C and the temperature dew point spread is less than 4°C.
- Operation of the engine bleed anti-ice system for longer than 10 seconds in static air temperature of +10°C or greater is prohibited.
- Avoid fan speeds (N_1) between 85 and 92% RPM when the engine ice protection systems are on and the altitude is above 25,000 ft. No limitation exists with only the windshield bleed air on or when the altitude is below 25,000 ft.

Information shown in italics is not included in the AFM Limitations chapter.

Horizontal Stabilizer Anti-Ice System

- Turn on the horizontal stabilizer anti-ice system when operating in visible moisture and the total air temperature (TAT/RAT) is between +10 and -30°C.
- Operation of the horizontal stabilizer anti-ice system above 41,000 ft is prohibited.

Operation in Humid Conditions After Landing

- *Leave the windshield anti-ice on.*
- *Increase engine power as required for external defogging.*
- *Close copilot's windshield bleed air valve for improved pilot's external defogging.*

Power Settings

- *To reduce the time required for the thermal bleed air anti-ice systems to reduce operating temperature, turn on those systems prior to reducing engine power for descent.*
- *Engine power must be kept above flight idle to keep the wing, windshield, and engine anti-ice lights extinguished.*

Information shown in italics is not included in the AFM Limitations chapter.

Landing Gear

Maximum Altitude (Extension) . . . . . 20,000 FT

Nose Tire Inflation – Approved Tires

Gross Weights to 21,000 Lbs, Unloaded . . . . 125 ±5 PSIG

Gross Weights Above 21,000 Lbs, Unloaded . . . . 138 PSIG

Gross Weights Above 21,000 Lbs, Loaded . . . 125 ±5 PSIG

- *Pressures identified as unloaded are pressures with the aircraft on jacks. Pressures identified as loaded are pressures with the aircraft weight on the tires.*

Parking Brake

- *Do not set the parking brake if the brakes are hot.*

Information shown in italics is not included in the AFM Limitations chapter.

Oxygen System

WARNING: Do not smoke when oxygen is in use or following use of passenger oxygen until lanyards are reinstalled.

- Service oxygen system with Aviator's Breathing Oxygen per MIL-O-27210.
- The use of medical oxygen is not approved.
- Refer to Servicing chapter for bottle capacities.
- Refer to AFM or SimuFlite Technical Manual Oxygen Supply Chart for oxygen duration.

Oxygen Masks

- Check, adjust, and properly stow the pressure demand oxygen mask prior to flight. (The EROS mask requires no size adjustment.)
- Crew and passenger oxygen masks are not approved for operation at a cabin altitude greater than 40,000 ft.
- Remove headsets and/or hats prior to donning oxygen masks. Headsets, eyeglasses, or hats worn by the crew may interfere with the quick-donning capabilities of the oxygen masks.
- If removing the headset, position the audio amplifier AUTO SEL/COMM switch(es) to SPKR to receive communication radios audio.
- *The passenger oxygen masks deploy automatically at a cabin altitude of approximately 13,500 ft when the passenger oxygen switch is in AUTO.*

Information shown in italics is not included in the AFM Limitations chapter.

Powerplant

Bypass Ratio . . . . . 3.1 TO 1

Engine Type

- Garrett TFE731-3B-100S
- Garrett TFE731-3BR-100S
- Garrett TFE731-3C-100S
- Garrett TFE731-3CR-100S

APR Engine Cycles

- Whenever APR operation results in exceeding 890°C or 100% N_2, record four engine cycles in the engine log.

APR Limitations

- Arming the automatic performance reserve (APR) system at takeoff weights less than 17,500 lbs is prohibited (**Citation III**).
- Scheduled performance predicated upon automatic performance reserve (APR) is not approved until a satisfactory test, as contained in the Normal Procedures, has been accomplished.

APR Takeoff Performance Limitations

- APR takeoff shall not exceed the weight, altitude, and temperature or any combination thereof as contained in the Maximum Takeoff Weight – Pounds Permitted by Climb Requirements and Takeoff Field Length – Feet tables contained in the applicable AFM Supplement.

Covers

- *Install engine covers after engines are cool.*

Information shown in italics is not included in the AFM Limitations chapter.

Engine and Flight Data Monitoring

- *Airworthiness Directive 92-12-09 requires recording and comparing flight data on engines with more than 500 hours since new.*
- *Discontinue further flight if ITT changes 20°C or more between engines within the last 10 flights of data.*
- *Discontinue flight if the N_1 is locked up after a shutdown time of one hour or more.*

Fan Speeds and Ice Protection Systems

- Avoid fan speeds (N_1) between 85 and 92% RPM when the engine ice protection systems are on and the altitude is above 25,000 ft.
- No limitation exists with only the windshield bleed air on or when the altitude is below 25,000 ft.

Fuel Computer

- *Establish position numbers for fuel computer adjustment by counting detents (i.e., clicks) from the fully counterclockwise stop on the control. This stop is position 1; the first click clockwise from the stop is position 2, etc., through position 11 (fully clockwise stop). Position numbers do not appear on the control.*
- Engine fuel computers must be on and operational for takeoff.

Fuel Control Manual Governor

- Verify the manual governor is operational per the preflight test in AFM Section III.

Ground Idle

- The ground idle switch must be in HIGH when conducting touch and go landings.

Information shown in italics is not included in the AFM Limitations chapter.

Ground Start Ambient Temperature

- The engine may be started in ambient temperatures from -54°C to ISA +37°C.
- Adequate cranking torque (1,000 amps minimum) must be available. Use of ground external power is recommended.
- The fuel must be within limits.

Oils Approved for APU

See Servicing chapter.

Oils Approved for Engine

- The following oils are approved for the engine. Do not mix brands of oil.
  - Mobil Jet Oil 254 (Type II)
  - Mobil Jet Oil II (Type II)
  - Exxon/Esso 2380 Turbo Oil (Type II)
  - Castrol 5000 (Type II)
  - Aeroshell/Royco Turbine Oil 500 (Type II)

Oil Capacities

Each Engine . . . . . 11.6 QUARTS

Optional Onboard APU . . . . . 3.0 QUARTS

Environmental Control Unit ACM . . . . . 3.4 OUNCES

Oil Level Check

- *Check engine oil within one hour after engine shutdown to obtain an accurate oil level.*

Information shown in italics is not included in the AFM Limitations chapter.

Oil Pressure and Temperature Limits

- Observe the limits in **Table 3-G**.

Thrust Setting	Operating Limits	
	Oil Pressure (PSIG)[1]	Oil Temperature (°C)
Takeoff	38 to 46	30 to 127[2]
Maximum Continuous	38 to 46	30 to 140[2]
Starting	See Note 3	-54 Minimum[4]

Table 3-G; Oil Pressure and Temperature Limits

[1] Idle oil pressure of 25 to 38 PSIG may occur during ground and flight operations.

[2] Up to 30,000 ft, maximum oil temperature is 127°C. Above 30,000 ft, maximum oil temperature is 140°C. Maximum transient oil temperature is 149°C for two minutes.

[3] During cold starts, oil pressure transients up to 55 PSIG for three minutes are allowed.

[4] Starting at ambient temperature of -40°C or less, preheating of engine and oil is recommended. Power settings above idle are not recommended until engine oil temperature is 30°C or warmer.

Powerplant Operating Limits – 3B-100S Engines

Thrust Setting	Operating Limits			
	Time Limit (Minutes)	ITT (°C)	N_2% Turbine RPM	N_1% Fan RPM
Takeoff	5	890	100	101.5
Maximum Continuous	Continuous	890	100	101.5
Starting	—	890	—	—

Table 3-H; Engine Operating Limits – Garrett TFE731-3B-100S Engines (Units 001 to 226; 001 to 226 with SB650-72-02)

Interturbine Temperature (ITT) Limits:

- The maximum normal start limit is 890°C.
  - – 890°C – When ITT limit is exceeded, immediately abort start. Determine cause and correct before attempting restart.
  - – 890 to 910°C less than 10 seconds – Abort start. Enter maximum ITT and duration in excess in engine log. Determine cause and correct.
  - – 890 to 910°C more than 10 seconds or over 910°C less than 5 seconds – Enter maximum ITT and duration in excess of limit in engine log. Determine cause and correct. Perform static takeoff power check.
  - – Over 910°C more than 5 seconds – Conduct hot section inspection before further engine operation.
  - – 950°C is attained and exceeded – Conduct overtemperature inspection.

- The maximum normal flight limit is 890°C.
  - 890 to 900°C less than 10 seconds – Reduce power, enter maximum ITT, and duration above limit in engine log.
  - 890 to 900°C for more than 10 seconds – Conduct hot section inspection prior to next engine start.
  - 950°C is attained and exceeded – Shut down engine and conduct overtemperature inspection.

NOTE: TFE731-3B-100S engines on both sides or mix of -3B-100S and -3C-100S engines.

Powerplant Operating Limits – 3BR-100S Engines

Thrust Setting	Operating Limits			
	Time Limit (Minutes)	ITT (°C)	N_2% Turbine RPM	N_1% Fan RPM
Takeoff	5	916	101	101.5
Maximum Continuous	Continuous	890	101	101.5
Starting	—	890	—	—

Table 3-I; Engine Operating Limits – Garrett TFE731-3BR-100S Engines (APR) (Unit 001 and Sub. with SB650-72-02)

Interturbine Temperature (ITT) Limits:

- The maximum normal ITT start limit is 890°C.
  - 890°C – When ITT limit is exceeded, immediately abort start. Determine cause and correct before attempting restart.
  - 890 to 910°C less than 10 seconds – Abort start. Enter maximum ITT and duration in excess of limit in engine log. Determine cause and correct.

- 890 to 910°C more than 10 seconds or over 910°C less than 5 seconds – Enter maximum ITT and duration in excess of limit in engine log. Determine cause and correct. Perform static takeoff power check.
- Over 910°C more than 5 seconds – Conduct hot section inspection before further engine operation.
- 960°C is attained or exceeded – Conduct overtemperature inspection.

- APR takeoff limit is 916°C and maximum normal flight limit is 890°C.
  - 916 to 926°C less than 10 seconds – Reduce power, enter maximum ITT and duration above limit in engine log.
  - 916 to 926°C more than 10 seconds – Conduct hot section inspection prior to next engine start.
  - 960°C is attained or exceeded – Shut down engine and conduct overtemperature inspection in accordance with engine light maintenance manual.

Powerplant Operating Limits – 3C-100S Engines

Thrust Setting	Operating Limits			
	Time Limit (Minutes)	ITT (°C)	N_2% Turbine RPM	N_1% Fan RPM
Takeoff	5	910	101	101.5
Maximum Continuous	Continuous	910	100	101.5
Starting	—	910	—	—

Table 3-J; Engine Operating Limits – Garrett TFE731-3C-100S Engines (Units 001 to 226 with SB650-72-01; 227 and Sub.)

Interturbine Temperature (ITT) Limits:

- The maximum normal ITT start limit is 910°C
  - 910°C – When ITT limit is exceeded, immediately abort start. Determine cause and correct before attempting restart.
  - 910 to 929°C less than 10 seconds – Abort start. Enter maximum ITT and duration in excess of limit in engine log. Determine cause and correct.
  - 910 to 929°C more than 10 seconds or over 929°C less than 5 seconds – Enter maximum ITT and duration in excess of limit in engine log. Determine cause and correct. Perform static takeoff power check.
  - Above 929°C more than 5 seconds – Conduct hot section inspection before further engine operation.
  - 971°C is attained or exceeded – Conduct overtemperature inspection.

- The maximum normal flight limit is 910°C.
  - 911 to 939°C for less than 5 seconds or 940 to 949°C less than 2 seconds – Reduce power, enter maximum ITT and duration above limit in engine log.
  - 940 to 949°C for more than 2 seconds – Shut down engine, enter maximum ITT in engine log. Conduct hot section inspection.
  - 950°C is attained or exceeded – Shut down engine and conduct overtemperature inspection.

NOTE: TFE731-3C-100S engines both sides.

Powerplant Operating Limits – 3CR-100S Engines

Thrust Setting	Operating Limits			
	Time Limit (Minutes)	ITT (°C)	N_2% Turbine RPM	N_1% Fan RPM
Takeoff	5	929	101.5	101.5
Maximum Continuous	Continuous	910	101.5	101.5
Starting	—	910	—	—

Table 3-K; Engine Operating Limits – Garrett TFE731-3CR-100S Engines (APR) (Unit 001 and Sub. with SB650-72-01)

Interturbine Temperature (ITT) Limits:

- The maximum normal ITT start limit is 910°C.
  - 910°C – When ITT limit is exceeded, immediately abort start. Determine cause and correct before attempting restart.

- 910 to 929°C less than 10 seconds – Abort start. Enter maximum ITT and duration in excess of limit in engine log. Determine cause and correct.
- 910 to 929°C more than 10 seconds or over 929°C less than 5 seconds – Enter maximum ITT and duration in excess of limit in engine log. Determine cause and correct. Perform static takeoff power check.
- Above 929°C more than 5 seconds – Conduct hot section inspection before further engine operation.
- 971°C is attained or exceeded – Conduct overtemperature inspection in accordance with engine light maintenance manual.

■ APR takeoff limit is 929°C and maximum normal flight limit is 910°C.

- 930°C to 939°C less than 5 seconds or 940 to 949°C less than 2 seconds – Reduce power. Enter maximum ITT and duration in engine log.
- 940 to 949°C for more than 2 seconds – Shut down engine, enter maximum ITT and duration in engine log. Conduct hot section inspection in accordance with engine light maintenance manual.
- 950°C is attained or exceeded – Shut down engine and conduct overtemperature inspection in accordance with engine light maintenance manual.

Powerplant Overspeed Limits

- Observe the limits in **Tables 3-L** and **3-M**.

Condition	One Minute[1]		Five Seconds[1]	Instantaneous[2]
	N_2 % RPM	N_1 % RPM	N_2/N_1 % RPM	N_2/N_1 % RPM
Transient	100.0 to 103.0	101.5 to 103.0	103.0 to 105.0	Exceeds 105.0
Steady State	—	—	—	Exceeds 105.0

Table 3-L; Garrett TFE731-3B-100S/-3C-100S

[1] Reduce power settings to bring within limits. Make necessary fuel control adjustment prior to next flight.

[2] Refer to engine maintenance manual.

Condition	One Minute[1]		Five Seconds[1]	Instantaneous[2]
	N_2 % RPM	N_1 % RPM	N_2/N_1 % RPM	N_2/N_1 % RPM
Transient	101.0 to 103.0	101.5 to 103.0	103.0 to 105.0	Exceeds 105.0
Steady State	—	—	—	Exceeds 105.0

Table 3-M; Garrett TFE731-3BR-100S/-3CR-100S

[1] Reduce power settings to bring within limits. Make necessary fuel control adjustment prior to next flight.

[2] Refer to engine maintenance manual.

Preheating

- *If exposed to temperatures of -18°C or lower for a prolonged period of time, heat the engine prior to start; the use of external power is recommended.*

Information shown in italics is not included in the AFM Limitations chapter.

Prolonged Ground Operations

- Continuous engine ground static operation up to and including five minutes at takeoff thrust is limited to ambient temperatures not to exceed the ambient temperature limits depicted in **Figure 3-1**, page 3-10.

Restart (Ground)

- *If engine restarts are required within 20 to 45 minutes after engine shutdown, rotate the fan by hand several times, or use the starter to motor the engine for five seconds, approximately 10 minutes after shutdown.*

Restart (In Flight)

- A windmilling airstart requires a stabilized minimum turbine speed of 15% turbine RPM (N_2).
- *If turbine speed is not stabilized or if airspeed results in a turbine speed less than 15%, starter assist is recommended.*
- *Use starter assist airstarts when stabilized turbine RPM (N_2) is below 15%.*
- Maximum altitude for manual mode airstarts is 20,000 ft.
- *The Engine Start procedure does not change with the engine fuel computer in manual mode.*
- Observe the limits shown in the Airstart Envelope (**Figure 3-10**, following page).

Synchronization

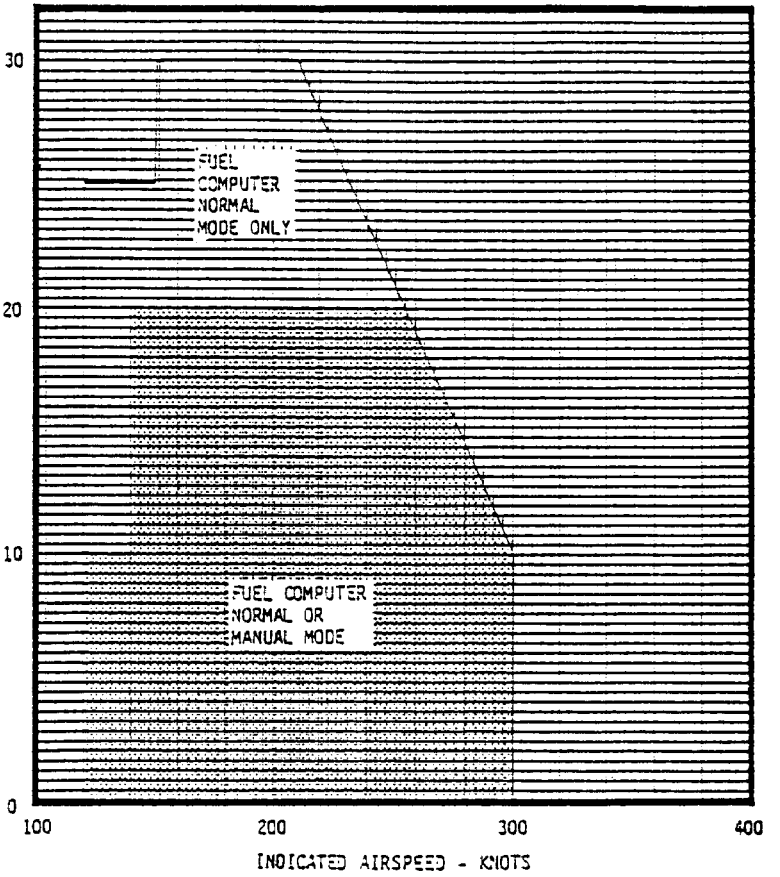
- The use of the engine synchronization system is prohibited during takeoff, landing, and single engine operations.

Thrust Rating

Takeoff, Standard Day at Sea Level . . . . . 3,650 LBS

Information shown in italics is not included in the AFM Limitations chapter.

Airstart Envelope



3-10

Thrust Reversers

- Maximum reverse thrust is limited to takeoff thrust.
- Reverse thrust must be reduced to idle reverse (detent) at 65 KIAS during landing rollout.
- Verify that the thrust reverser(s) are operational per the preflight test in AFM Section III.
- Thrust reverser usage during touch and go landings is prohibited.
- Thrust reversers are restricted to ground operation only on paved surfaces.

CAUTION: Immediately after stowing thrust reversers after landing, do not advance throttles until the thrust reverser UNLOCK lights extinguish.