3

CJ2 Limitations

Contents

CJ2 Limitations

Operating Limitations

NOTICE

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

Certification Status

This airplane is certified in accordance with FAR, Part 23 (normal category), 36 (noise). Takeoff and Landing performance special condition certification requirements are equivalent to FAR 25.

Weight Limitations

Maximum Design Ramp Weight . . . . . 12,500 lbs (5,670 Kg)

Maximum Design Takeoff Weight . . . . . 12,375 lbs (5,613 Kg)

Maximum Design Landing Weight. . . . . .11,500 lbs (5,216 Kg)

Maximum Design Zero Fuel Weight . . . . . 9,300 lbs (4,218 Kg)

Takeoff weight is limited by the most restrictive of the following requirements:

Maximum Certified Takeoff Weight . . . . . 12,375 lbs (5,613 Kg)

Maximum Takeoff Weight
Permitted by Climb Requirements . . . . . Refer to Procedures for Use of Takeoff Performance Tables in Section IV

Takeoff Field Length . . . . . Refer to Procedures for Use of Takeoff Performance Tables in Section IV

Landing weight is limited by the most restrictive of the following requirements:

Maximum Certified Landing Weight. . . . . .11,500 lbs (5,216 Kg)

Maximum Landing Weight Permitted by Climb
Requirements or Brake Energy Limit. . . . . Refer to Procedures for Use of Approach and Landing Performance Tables in Section IV

Landing Distance. . . . . Refer to Procedures for Use of Approach and Landing Performance Tables in Section IV

Center-of-Gravity Limits

Center-of-Gravity Moment Envelope . . . . . Refer to figure 3-1

Weight and Balance Data

The airplane must be operated in accordance with the approved loading schedule. (Refer to Weight and Balance Data, Section VI).

Center-of-Gravity Moment Envelope

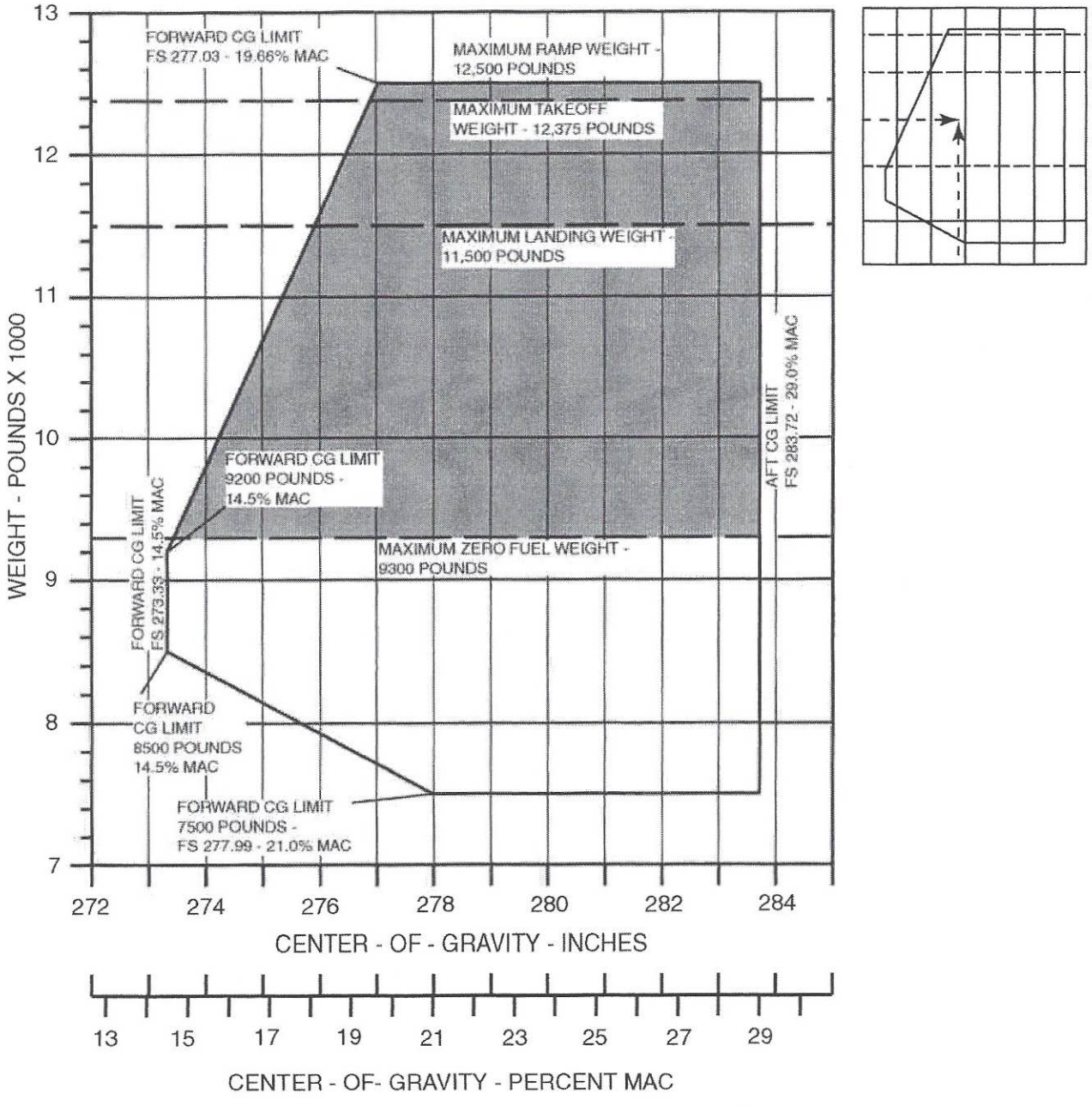

Figure 3-1: Center-of-Gravity Limits

Powerplant Limitations

Engine Type . . . . . .Williams International FJ44-2C Turbofan
Engine Operating Limits . . . . . Refer to Table 3-1
Engine Temperature (ITT) Limits . . . . . Refer to Figures 3-2 and 3-3
Engine Overspeed Limits . . . . . Refer to Figures 3-4 and 3-5
Takeoff/Go Around Thrust . . . . . Refer to Figure 4-8, AFM Section IV
Maximum Continuous
Thrust Single-Engine . . . . . .Refer to Figures 4-9 and 4-10, AFM Section IV
Maximum Continuous Thrust Multi-Engine . . . . . Refer to Figure 4-11, AFM Section IV

Engine Operating Limits

Operating Conditions	Operating Limits					
Thrust Setting	Time Limit (Minutes)	ITT Temperature °C	N_2% Turbine RPM	N_1% Fan RPM	Oil Pressure PSIG	Oil Temperature °C
Start	–	Refer to figure 3-3	–	–	–	-40 to 135 (Note 7)
GND Idle	Continuous	–	53.4 ±2.5	–	35 Min. 100 Max (Note 6)	-40 to 135 (Note 7)
FLT Idle	Continuous	–	64.3 ±2.5	–	35 Min. 100 Max (Note 6)	-40 to 135 (Note 7)
Takeoff	5 (Note 1)	820 Max	98.8	105.2 (Note 1)	45 - 90 (Note 3)	10 - 135
Maximum Continuous	Continuous	805 Max	98.8	105.2 (Note 2)	45 - 90 (Note 3)	10 - 135
Transient	–	Refer to figure 3-2	Refer to figure 3-4	Refer to figure 3-5	23 Min (Note 4) 100 Max (Note 5)	149 (Note 8)

Table 3-1: Engine Operating Limits

NOTE:

1. Takeoff ratings that are nominally limited to 5 minutes duration may be used for up to 10 minutes for One Engine Inoperative operations. Time limit begins when throttle lever is advanced for takeoff thrust. The takeoff thrust (N_1) for the airplane is defined in Figure 4-8, AFM Section IV and is more limiting than engine rotational limits, and must be observed. Performance data, including V_{MCA} and V_{MCG} in Section IV, is based on use of the takeoff thrust setting.
2. Maximum Continuous Thrust (MCT) for the airplane is defined by Figures 4-9 and 4-10, AFM Section IV (single engine) and Figure 4-11, AFM Section IV (multi-engine). These thrust limits (N_1) are more limiting than engine rotational limits and must be observed. Performance data in Section IV is based on the use of the appropriate MCT setting.
3. Minimum oil pressure is 45 PSIG when operating at or above 80% N_2; 35 PSIG when operating below 80% N_2.
4. Minimum allowable oil pressure is 23 PSIG for up to 5 minutes when operating below 80% N_2.
5. Maximum allowable oil pressure is 100 PSIG for up to 5 minutes when operating at or above 80% N_2.
6. Maximum allowable oil pressure is 100 PSIG for up to 5 minutes with oil pressure returning to normal range.
7. The engine should not be operated above 80% N_2 until oil temperature is above 10°C.
8. Maximum oil temperature is 149°C for up to 5 minutes when operating below 80% N_2.

Temperature Limits (Except Starting)

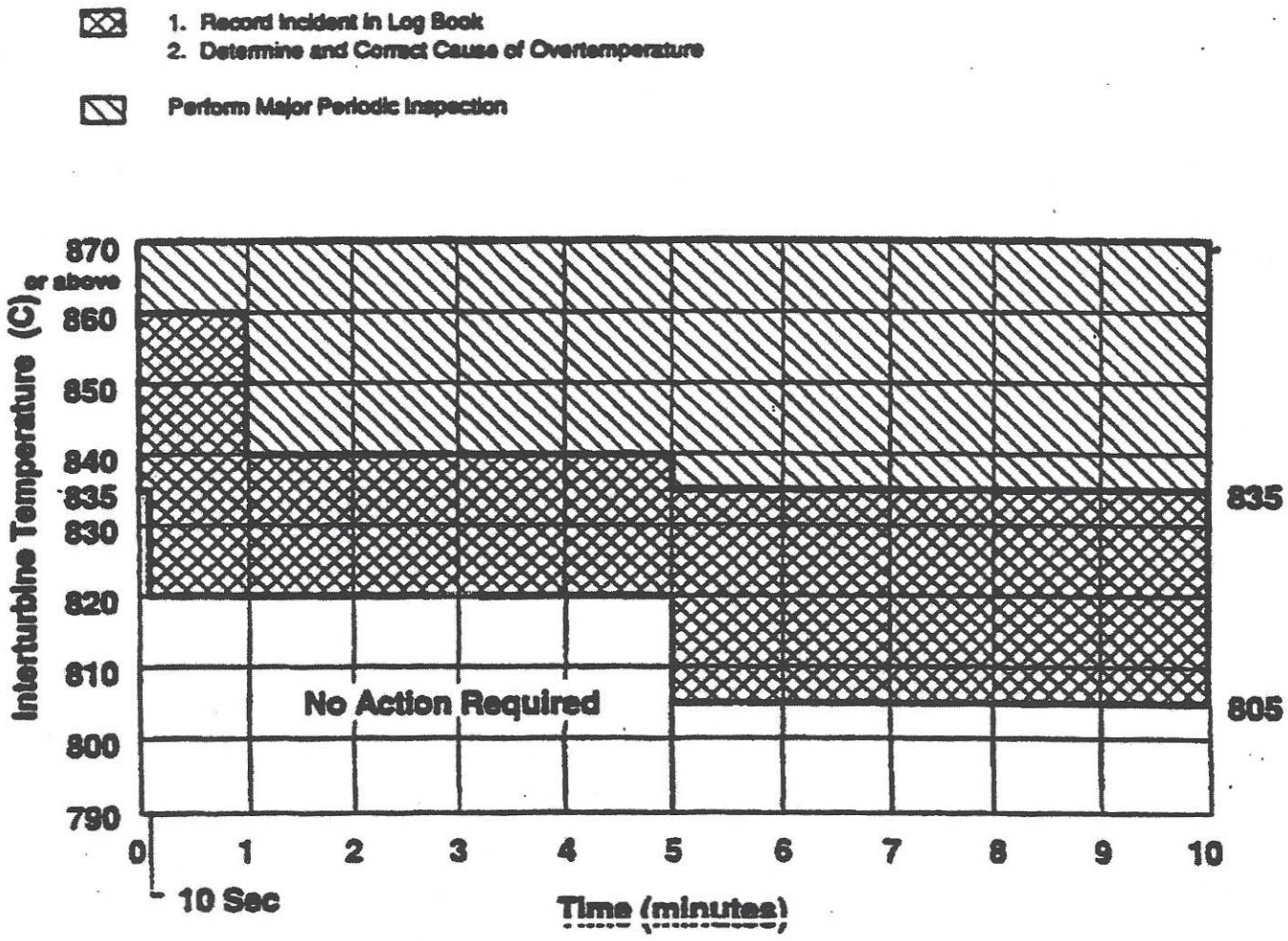

Figure 3-2: Temperature Limits (Except Starting)

Temperature Limits (Starting)

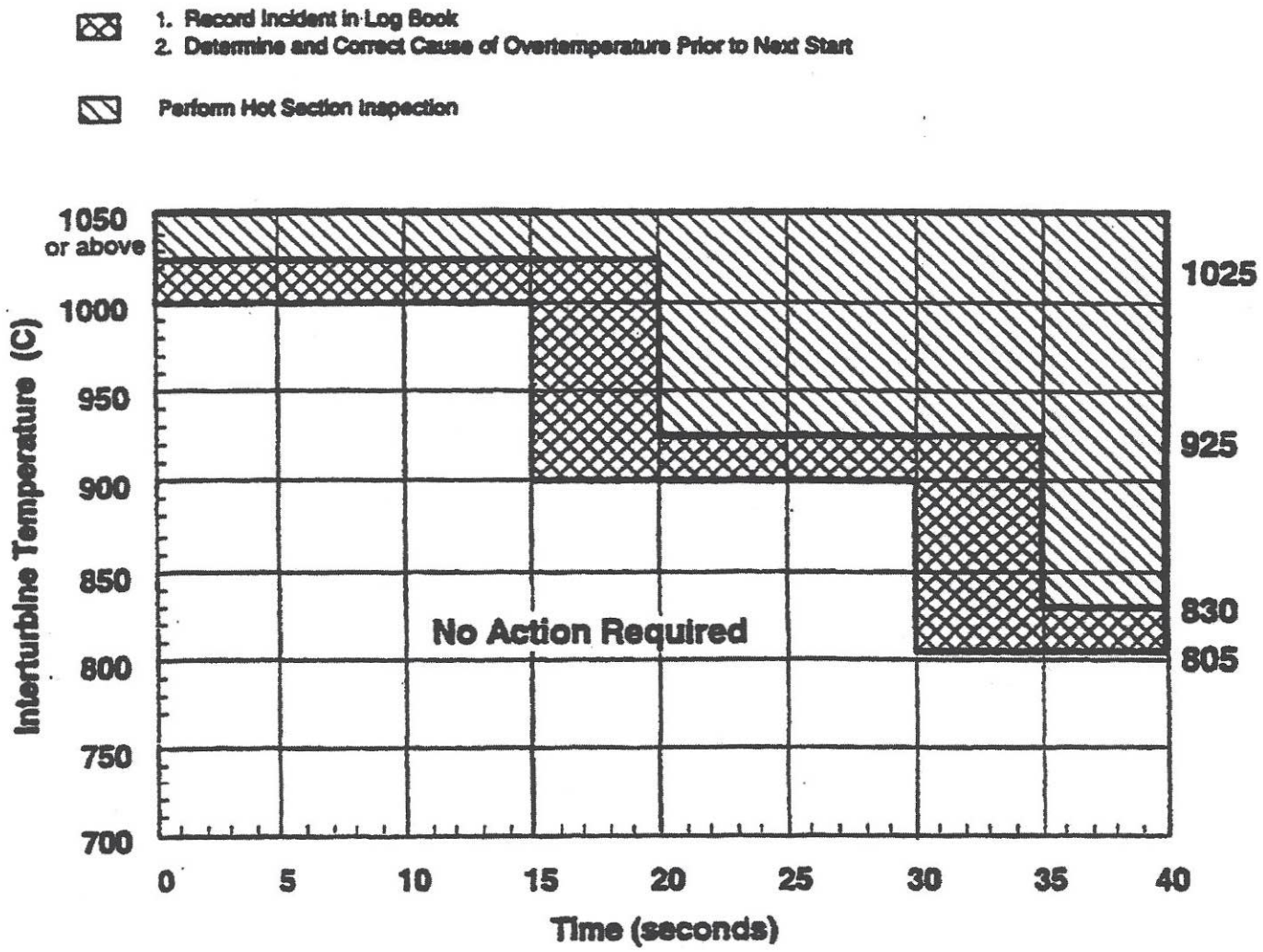

Figure 3-3: Temperature Limits (Starting)

N_2 Engine Overspeed Limits

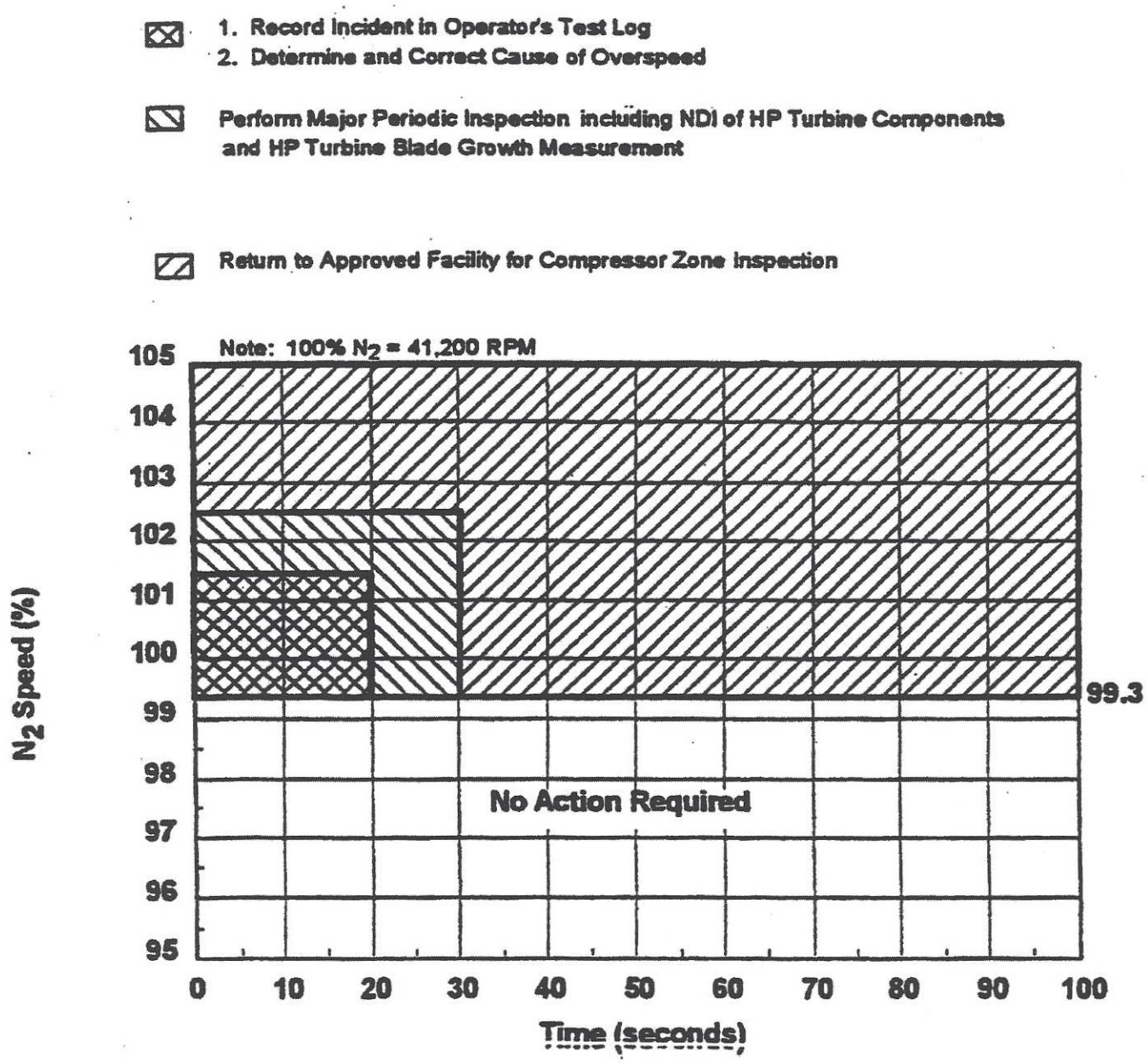

Figure 3-4: N_2 Engine Overspeed Limits

N_1 Engine Overspeed Limits

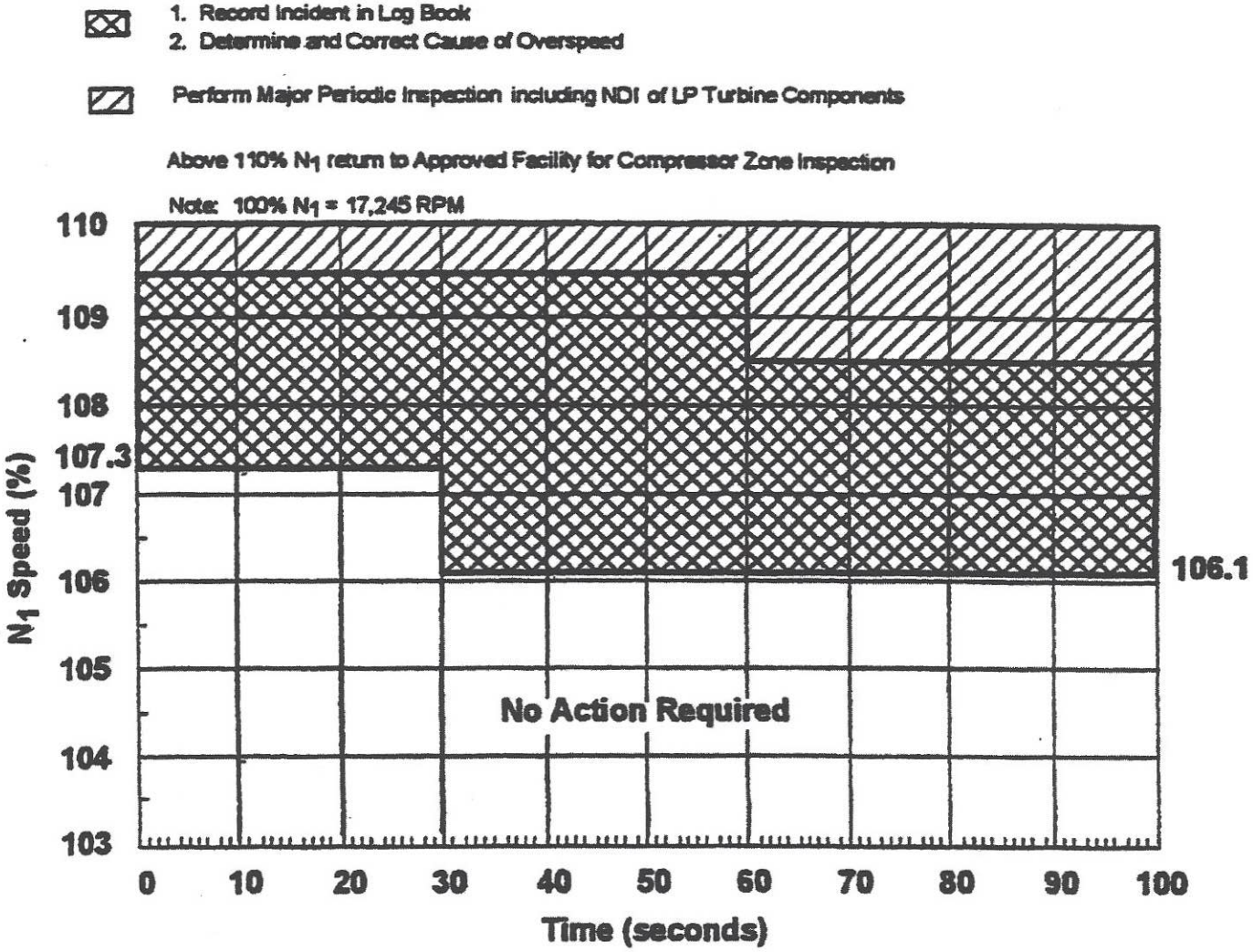

Figure 3-5: N_1 Engine Overspeed Limits

Engine Start Limitations (Ground)

Temperature (ITT) Limits . . . . . .Refer to Figure 3-3

Maximum Tailwind Component
(airport elevation 10,000 ft or lower. . . . . .16 Kts

Maximum Tailwind Component
(airport elevation above 10,000 ft). . . . . .0 Kts

> ***NOTE:*** Thrust attenuator switch must be in AUTO for tailwind within ± 30° of the tail.

Maximum Time to Light-off . . . . . 10 Seconds

> ***NOTE:*** Time to light-off is defined as the time after the throttle lever is moved from off to idle position until light-off is indicated.

Minimum Ambient Temperature For
Engine Start (If Airplane Is Cold Soaked) . . . . . -33°C

> ***NOTE:***
>
> 1. If the airplane is cold soaked below -33°C, it must be preheated prior to engine start.
> 2. If the battery is cold soaked below -18°C it must be preheated to above -18°C prior to start.
> 3. The Engine Indicating System (EIS) may take 1 to 6 minutes to become usable after power is applied when cold soaked below -10°C.

Maximum Temperature For Engine Start . . . . . .Refer to Figure 3-7

Maximum Airport Elevation For Ground Battery Start . . . . . 14,000 Ft

Maximum Airport Elevation for
Ground External Power Start. . . . . 14,000 Ft

Minimum Battery Voltage For Battery Start. . . . . 24 VDC

Minimum/Maximum External Power
Current Capacity For Start . . . . . 800/1,100 AMPS

> ***NOTE:*** Normal starter current draw is approximately 1,000 amps peak. External power units with variable maximum current shutoff should be set to 1,100 amps. Use of an external power sources with voltage in excess of 29 VDC or current in excess of 1,100 amps may damage the starter.

Engine Start Limitations (Air)

Temperature (ITT) Limits . . . . . Refer to Figure 3-3

Airspeed/Altitude Limits . . . . . Refer to Figure 3-1, AFM Section III

Engine Operation In Hail Or Heavy Rain

Engine parameters may fluctuate during flight through areas of hail and/or heavy rain, but will return to normal after exiting these conditions. If hail and/or heavy rain is encountered:

- Ignition must be ON
- Flight at or below 15,500 ft: Turbine speed must be maintained at 70% N_2 or greater
- Flight above 15,500 ft: Turbine speed must be maintained at 76.5% N_2 or greater

Engine Fan Inspection

Prior to engine start the Engine Fan Duct and Fan inspection in Section III, Normal Procedures, must be satisfactorily completed.

Starter Cycle Limitations

Starter Cycle Limitation: Three engine starts per 30 minutes. Three cycles of operation with a 60 seconds rest period between cycles is permitted.

NOTE: This limitation is independent of starter power source: i.e. battery, generator assisted cross start, or external power unit.

Battery Limitations

The battery temperature warning system must be operational for all ground and flight operations.

The battery temperature warning system preflight test in Section III, Normal Procedures, must be satisfactorily completed.

If the BATT O'TEMP light illuminates during ground operation, do not take off until the proper maintenance procedures have been accomplished.

Battery Cycle Limitations: Three engine starts per hour.

NOTE:

1. If battery limitation is exceeded, ground maintenance procedures are required. Refer to Chapter 24 of the Maintenance Manual for procedure.
2. Three generator assisted cross starts are equal to one battery start.
3. If an external power unit is used for start, no battery cycle is counted.

Ground Operation

Continuous engine ground static operation up to and including five minutes at takeoff thrust is limited to ambient temperatures defined in Figure 3-7.

Generator Current . . . . . .250 Amps

Limit ground operation of pitot/static heat to two minutes to preclude damage to the pitot tubes and angle of attack vane.

Prolonged ground operation at high engine RPM with engine, wing, and/or windshield anti-ice on is prohibited. Do not operate with the wing anti-ice on more than one minute after the WING ANTI-ICE L/R annunciators have extinguished.

Avionics ground operation temperature limitations (OAT greater than ISA + 5°C):

- Avionics cooling fans must be operational and verified by checking for airflow at glareshield exit vents
- With air conditioning OFF - Avionics operation is limited to 30 minutes and OAT less than ISA+32°C
- With air conditioning ON - Avionics operation is limited to OAT less than or equal to ISA + 35°C, with no time limit
- Avionics operation above ISA + 35°C is prohibited

Windshield Ice Protection Fluid

Use TT-I-735 isopropyl alcohol for windshield anti-ice.

Hydraulic Fluid

Use MIL-H-83282 Type fluids only.

Fuel Limitations

Approved anti-icing additive must be added to all approved fuels not presently containing the additive.

Fuel Boost - ON; when L and/or R FUEL LOW LEVEL caution lights illuminate or at 220 lbs or less indicated fuel.

NOTE: If fuel transfer is required, turn Fuel Boost OFF on side opposite selected tank. (Refer to table below for fuels that are approved for use).

Grade (type) (refer to Caution and Note 1 below)	Specification	Minimum fuel temperature °C/°F	Maximum fuel temperature °C/°F
JET A		-40/-40	57.2/135
JET A1	ASTM-D1655	-40/-40	57.2/135
JP-8	MIL-T-83133	-40/-40	57.2/135

CAUTION

Fuel not having anti-icing additive pre-blended at the refinery must have anti-icing fluid added.

Fuel must contain 0.10 to 0.15 % (by volume) anti-icing additive per MIL-I-27686 (EGME), or MIL-I-85470 (DIEGME).

NOTE:

1. Dupont Stadis 450 anti-static additive or equivalent is permitted to bring fuel up to 300 conductive units, but not to exceed 1 ppm (parts per million).
2. SOHIO Biobor JF biocide additive is approved at a concentration not to exceed 20 ppm (270 ppm total additive) of elemental boron.
3. EGME/DIEGME additive is approved at a concentration not to exceed 0.15% volume.

Approved Oils

Approved brand	Specification
Mobil Jet II	MIL-L-23699
Mobil 254	MIL-L-23699
Exxon 2380 (Emergency only)	MIL-L-23699

NOTE: Mixing of approved oils is permissible. Exxon 2380 oil may be used pure or mixed with approved oil only for a maximum of 25 hours run time between major periodic inspections. Record in the engine log book the total amount of run time with Exxon 2380 oil. Following any usage of Exxon 2380 oil, the oil tank must be drained, flushed with approved oil, and serviced with pure approved oil. (Definition of oil flush is removal of chip collector screens, and pouring one quart of approved oil through the oil fill port)

Unusable Fuel

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

Speed Limitations

Maximum Operating Limit Speeds

M_{MO} (Above 29,300 ft) . . . . . 0.720 Mach (Indicated)
V_{MO} (Between 8,000 and 29,300 ft) . . . . . 275 KIAS
V_{MO} (Below 8,000 ft) . . . . . 260 KIAS

The maximum operating limit speeds may not be deliberately exceeded in any regime of flight (climb, cruise or descent) unless a higher speed is authorized for flight test or pilot training.

Maximum Maneuvering Speeds - V_A . . . . . Refer to Figure 3-6

Full application of rudder and aileron controls as well as maneuvers that involve angle-of-attack near the stall should be confined to speeds below maximum maneuvering speed. Refer to LOAD FACTOR limitations for pitch maneuvering limitations.

Maximum Flap Extended Speed - V_{FE}

TAKEOFF & APPROACH Position (15°) . . . . . 200 KIAS

LAND Position (35°) . . . . . 161 KIAS

Maximum Speed With Flaps Failed to Ground Flaps (60°) . . . . . 140 KIAS

Maximum Landing Gear Extended Speed - V_{LE} . . . . . 200 KIAS

Maximum Landing Gear Operating Speed· V_{LO} (Extending). . . . . 200 KIAS

Maximum Landing Gear Operating Speed - V_{LO} (Retracting) . . . . . 200 KIAS

Maximum Speed Brake Operation Speed - V_{SB}. . . . . No Limit

Maximum Autopilot Operation Speed . . . . . 275 KIAS or 0.720 MACH

NOTE: For minimum control speeds (V_{MCA} and V_{MCG}) refer to the respective definition in Section IV, Performance - General.

Ground Flaps Limitations

Intentional selection of Ground Flaps in flight is prohibited.

WARNING

THE GROUND FLAPS POSITION IS NOT LOCKED OUT IN FLIGHT. SELECTION OF GROUND FLAPS WILL SIGNIFICANTLY INCREASE DRAG AND SINK RATE

Takeoff and Landing Operational Limits

Maximum Altitude Limit . . . . . .14,000 ft

Maximum Tailwind Component . . . . . 10 Kts

Maximum Ambient Temperature . . . . . Refer to Figures 3-7 and 4-7, AFM Section IV

Minimum Ambient Temperature. . . . . -33°C

The maximum asymmetric fuel differential is 200 lbs, however, controllability for safe return and landing has been demonstrated with an emergency asymmetrical difference of 600 lbs.

Rudder Bias must be operational for takeoff, and a satisfactory preflight test must be performed in accordance with Section III, Normal Procedures.

The Angle-of-Attack and Stall Warning System must be operational for takeoff and a satisfactory preflight test must be performed in accordance with Section III, Normal Procedures.

The autopilot and yaw damper must be OFF for takeoff and landing.

Prior to takeoff, the Elevator Trim check in Section III, Normal Procedures must be satisfactorily completed.

Engine synchronizer must be OFF for takeoff and landing.

Anti-Skid must be operational for takeoff.

Cabin must be depressurized for takeoff and landing.

Takeoffs and Landings are limited to paved runway surfaces.

Landings on other than dry runway surfaces must be conducted with 15° flaps as the landing flap setting and use of Ground Flaps is prohibited. Refer to Section VII for landing distance corrections applicable to runway surfaces other than dry.

Speed brakes must be retracted prior to 50 ft on landing.

Touch and go landings utilizing 15° flaps for the landing flap setting are prohibited.

Extending Ground Flaps during touch and go landings is prohibited.

The Ground Idle switch must be in the High position when conducting touch and go landings.

Goodyear tire part number 184F68-1, and tire part numbers 030-611-0 and 031-613-8 (manufactured by BFGoodrich/Michelin) are the only nose tires approved. The nose tire must be inflated to 120 PSI + 5 or -5 PSI.

Maximum Tire Ground Speed . . . . . .165 Kts

Enroute Operational Limits

Maximum Operating Altitude . . . . . .45,000 ft

Maximum Ambient Temperature . . . . . .Refer to Figure 3-7

Minimum Ambient Temperature. . . . . .Refer to Figure 3-7

Generator Load . . . . . 300 Amps Up to 41,000 ft

250 Amps Above 41,000 ft

Maximum Maneuvering Speeds

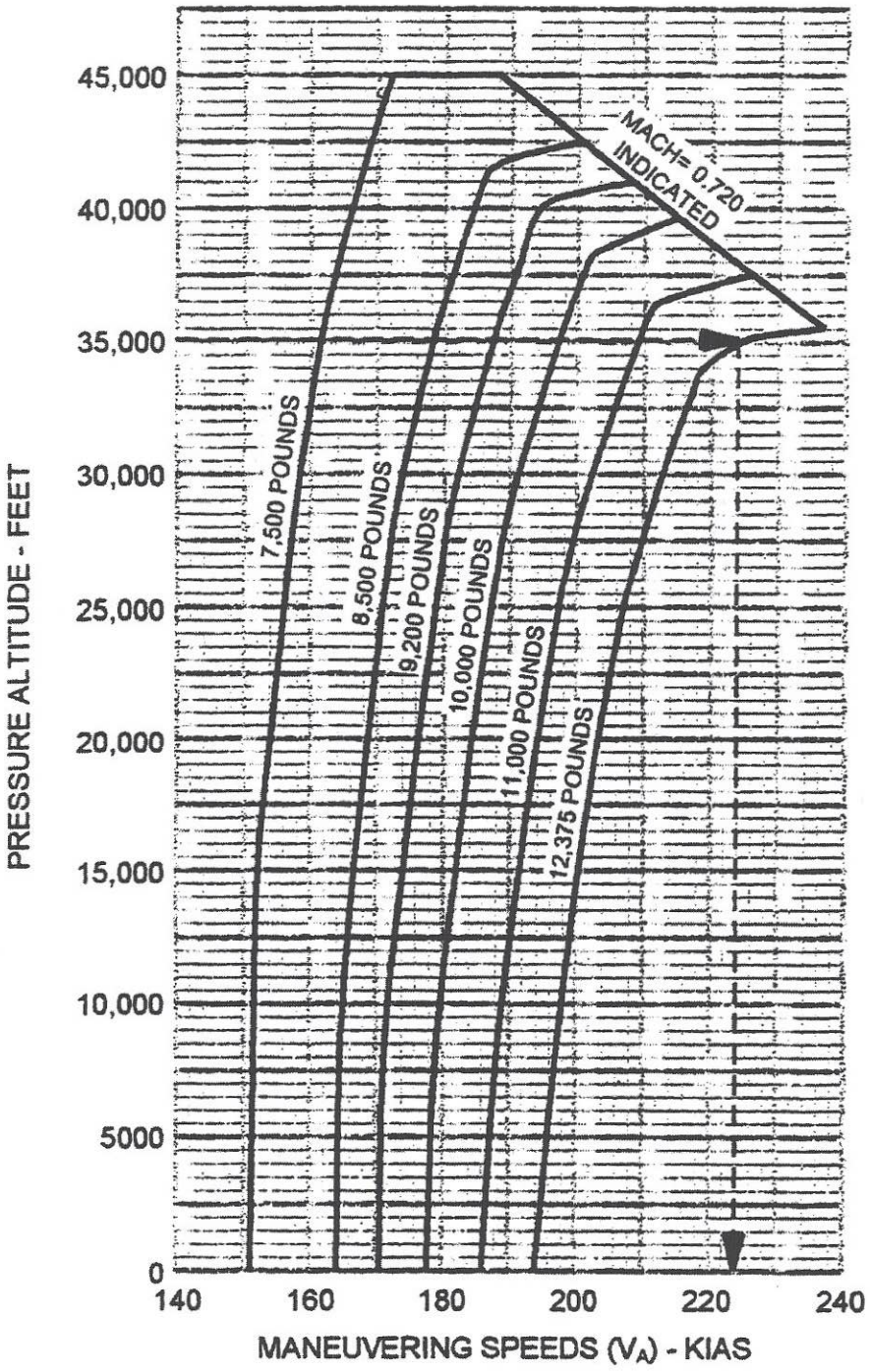

Figure 3-6: Maximum Maneuvering Speeds

Example:

Pressure Altitude: 35,000 ft

Weight: 12,375 lbs

Maximum Maneuvering Speed: 224 Kts

Takeoff/Landing/Enroute Temperature Limitations

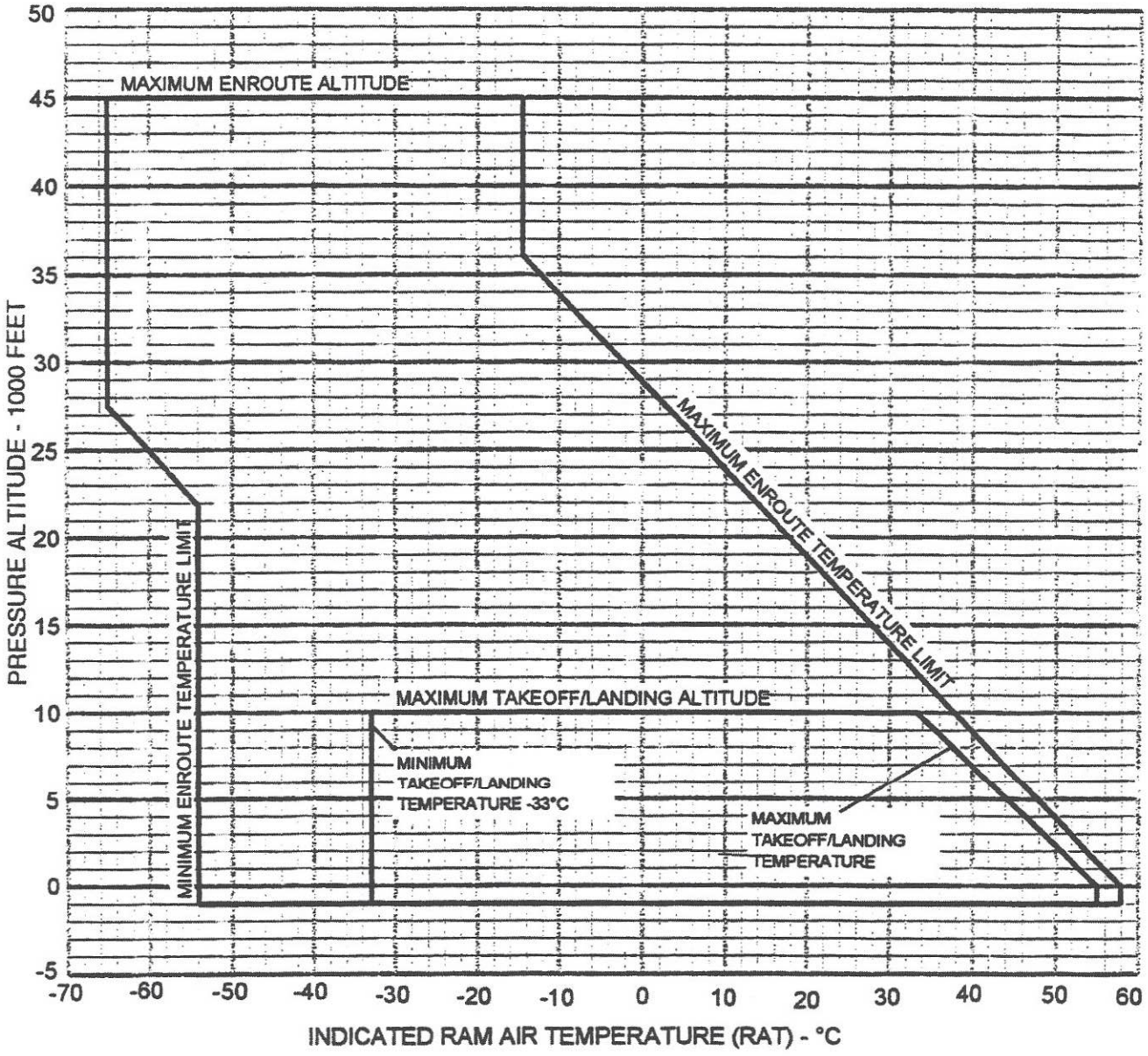

Figure 3-7: Takeoff/Landing/Enroute Temperature Limitations

* Maximum Enroute Operating Temperature Limit is the Indicated RAM Air Temperature (RAT) from Figure 3-7.

Operations Authorized

This airplane is approved for day and night, VFR and IFR and flight into known icing conditions when the required equipment is installed as defined within the KINDS OF OPERATIONS EQUIPMENT LIST.

Acrobatic maneuvers, including spins, are prohibited. Intentional stalls are prohibited above 18,000 ft.

Minimum Crew

Except where otherwise prescribed by applicable operating limitations,

Minimum crew for all operations:

1 Pilot, provided:

a. The pilot holds a CE525(S), single pilot, type rating.

b. The airplane is equipped for single pilot operation as specified in the Kinds of Operations Equipment List.

c. The pilot must occupy the left pilot's seat.

or

1 Pilot and 1 Copilot provided:

a. The pilot in command holds a CE525(S) or CE525 (second-in-command required) type rating.

Load Factor

In Flight

Flaps UP Position (0°) . . . . . -1.52 to + 3.6G at 12,375 lbs

Flaps TAKEOFF & APPROACH to LAND Position (15° to 35°) . . . . . 0.0 to + 2.0G at 12,375 lbs

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

Cabin Pressurization Limitations

Normal Cabin
Pressurization Limitations . . . . . 0.0 to 8.9 PSI ± 0.1 PSI Differential

Passenger Seating

For all takeoffs and landings, adjustable seats must be fully upright and outboard.

Maximum passenger seating, not including 2 crew seats, is seven (eight with optional belted toilet installed).

Instrument Markings

Engine Indicating System

Fan (N_1) RPM Indicators

Scale Markings:

Red Line . . . . . 105.3% RPM

Tape/Pointer/ Digital Readout:

Red . . . . . ≥ 106.5% RPM

105.3 to 106.4% RPM for ≥ 30 SEC

Yellow . . . . . ≥ 105.3% ≤ 106.4% < 30 SEC

Tape/Pointer:

White . . . . . ≤ 105.2% RPM

Digital Readout:

Green . . . . . ≤ 105.2% RPM

NOTE:

- Tape, Pointer and Digital Readout will turn red or yellow if outside normal operating limits.
- Pointer and Digital Readout will flash for 5 seconds and then remain steady if outside normal limits.
- White Tape Pointer represents Green band.

Inter-Turbine Temperature Indicators

Engine Start:

Scale Markings:

Red Triangle . . . . . 1,002°C

Red Line . . . . . 822°C

Yellow Band . . . . . 806°C to 820°C

Tape/Pointer:

Red . . . . . ≥ 1,002°C

White . . . . . ≤ 1,000°C

NOTE:

- Tape will turn red and Pointer will flash red for five seconds and then remain steady red if outside normal starting operating limits.
- Engine Running Red Line and Yellow Band do not apply while ITT Start Limit (Red Triangle) is in view.
- White Tape Pointer represents Green band.

Engine Running:

Scale Markings:

Red Line . . . . . .822°C

Yellow Band. . . . . 806 to 820°C

Tape/Pointer:

Red . . . . . ≥ 822°C

806°C to 820°C for ≥ 5 MIN

Yellow . . . . . .806°C to 820°C for < 5 MIN

White . . . . . ≤ 804°C

NOTE:

- Tape will turn red or yellow, the Pointer will flash red or yellow for five seconds and then remain steady if outside normal operating limits.
- White Tape Pointer represents Green band.

Turbine (N_2) RPM Indicators

Digital Readout:

Red . . . . . ≥ 98.9%

Green. . . . . ≤ 98.8%

NOTE: Digital Readout will flash red for five seconds and then remain steady if outside normal operating limits.

Oil Temperature Indicators

Scale Markings:

Red Band. . . . . ≥ 136°C

Yellow Band. . . . . ≤ 9°C

Green Band . . . . . 10°C to 135°C

Pointer:

Red . . . . . ≥ 136°C

Yellow . . . . . ≤ 9°C

Green. . . . . 10°C to 135°C

Digital Readout:

Red . . . . . ≥ 136°C

Yellow . . . . . ≤ 9°C

NOTE:

- Pointer and Digital Readout will flash red or yellow for five seconds and then remain steady if outside normal operating limits.
- Digital Readout is displayed only when temperature is outside normal operating limits.

Oil Pressure Indicators

Scale Markings:

Red Band . . . . . ≤ 22 PSI
≥ 101 PSI

Yellow Band . . . . . 23 to 34 PSI
91 to 100 PSI

Green Band . . . . . 35 to 90 PSI

> ***NOTE:*** Oil Pressure Indicator Scale Markings do not change with varying N_2.

N_2 < 80%:

Pointer:

Red . . . . . ≤ 22 PSI
23 to 34 PSI ≥ 5 MIN
91 to 100 PSI ≥ 5 MIN
≥ 101 PSI

Yellow . . . . . 23 to 34 PSI < 5 MIN
91 to 100 PSI < 5 MIN

Green . . . . . 35 to 90 PSI

Digital Readout:

Red . . . . . ≤ 22 PSI
23 to 34 PSI ≥ 5 MIN
91 to 100 PSI ≥ 5 MIN
≥ 101 PSI

Yellow . . . . . 23 to 34 PSI < 5 MIN
91 to 100 PSI < 5 MIN

N_2 ≥ 80%:

Pointer:

Red . . . . . ≤ 44 PSI
91 to 100 PSI ≥ 5 MIN
≥ 101 PSI

Yellow . . . . . 91 to 100 PSI < 5 MIN

Green . . . . . 45 to 90 PSI

Digital Readout:

Red . . . . . ≤ 44 PSI
91 TO 100 PSI ≥ 5 MIN
≥ 101 PSI

Yellow . . . . . 91 TO 100 PSI < 5 MIN

NOTE:

- Pointer and Digital Readout will flash red or yellow for five seconds and then remain steady if outside normal operating limits, with one exception: For oil pressure 91 to 100 PSI, the pointer will change to yellow but digits will not be displayed until 4 minutes have elapsed, at which time both yellow digits and pointer will flash for 5 seconds then remain steady.
- Digital Readout is displayed only when pressure is outside normal operating limits.

Other Instruments

Airspeed Indicator . . . . . Red Line: 275 KIAS (0.72 MACH)
260 KIAS (Below 8,000 ft)

Ammeter Indicators . . . . . Red. Line: 300 Amps
Yellow Arc: 250 - 300 Amps

Cabin Differential Pressure Indicator. . . . . Red Line: 8.9 PSI
Green Arc: 0.0 - 8.9 PSI

Oxygen Pressure Indicator . . . . . Red Line: 2,000 PSI
Yellow Arc: 0 - 400 PSI
Green Arc:1600 - 1,800 PSI

Brake and Gear Pneumatic Pressure
Indicator (In nose compartment. . . . . Wide Red Arc: > 2,050 PSI
Narrow Red Arc: 0 - 1,600 PSI
Wide Yellow Arc: 1,600 - 1,800 PSI
Wide Green Arc: 1,800 - 2,050 PSI

Brake Hydraulic Accumulator
Pressure Indicator
(In nose compartment) . . . . . .Narrow Red Arc: Under pressure
Light Green Arc: Pre-charge Pressure
Yellow Arc: Caution
Wide Green Arc: Normal Operating Range
Wide Red Arc: Overpressure

Rockwell Collins FCS-3000 Integrated Flight Control System

The Rockwell Collins Pro Line 21 Avionics System Pilot's Guide for Cessna Citation CJ1/CJ2 Publication Number 523-0780351-002117, dated 02/07/2000 or later revision must be immediately available to the flight crew.

One pilot must remain in his/her seat with the seat belt fastened during all autopilot operations.

Operating in the composite mode is limited to training and display failure conditions.

The pilot's PFD (and copilot's if installed) and MFD must be installed and operational in the normal mode for takeoff.

The FCS-3000 system must be verified to be operational by a satisfactory automatic preflight test (no messages on power up) prior to each flight in which the autopilot is to be used.

The autopilot minimum use height is:

ILS Approach	70 Ft AGL
All other operations	240 Ft AGL

Category II approaches are not approved.

VOR approaches must be conducted in the APPR mode.

The TURB mode of the flight control system must be off when conducting either VOR or LNV (FMS) approaches.

Standby Gyro Horizon

A satisfactory preflight test must be accomplished on the standby gyro system in accordance with Section III, Normal Procedures.

Oxygen Mask

Prior to flight, the EROS oxygen mask must be checked and stowed properly in its receptacle to qualify as a quick donning oxygen mask.

NOTE:

- Headsets, eyeglasses or hats worn by the crew may interfere with the quick donning capability of the oxygen mask.
- Unless carefully trimmed, mustaches and/or beards worn by crew members may interfere with proper sealing of the oxygen mask. Mask fit and seal should be checked on the ground prior to flight.

Continuous use of the supplemental oxygen system above 25,000 ft cabin altitude, with passengers, or above 40,000 ft cabin altitude, crew only, is prohibited.

For single pilot operations, a crew oxygen mask must be available for a passenger occupying the right crew seat. The mask must be checked during preflight and passenger briefed on its use.

Icing Limitations

NOTE:

- Icing conditions exist when the indicated RAT in flight is +10°C or below, and visible moisture in any form is present
- Icing conditions on the ground exist when the OAT or indicated RAT is +10°C or below and, where surface snow, slush, ice or standing water may be ingested by the engines or freeze on engine nacelles, or engine sensor probes.

Minimum engine N_2 speed for effective wing anti-icing . . . . . .75% N_2

Minimum temperature for
operation of tail deicing boots (Indicated RAT . . . . . -35°C

Engine anti-ice must be ENG ON or WING/ENG for operations with indicated RAT of +10°C or below when flight free of visible moisture cannot be assured.

After an icing encounter with inoperative tail deice boots, maximum flap deflection is 15°.

Operations in Severe Icing Conditions

WARNING

SEVERE ICING MAY RESULT FROM ENVIRONMENTAL CONDITIONS OUTSIDE OF THOSE FOR WHICH THE AIRPLANE IS CERTIFIED. FLIGHT IN FREEZING RAIN, FREEZING DRIZZLE, OR MIXED ICING CONDITIONS (SUPERCOOLED LIQUID WATER AND ICE CRYSTALS) MAY RESULT IN ICE BUILD-UP ON PROTECTED SURFACES EXCEEDING THE CAPABILITY OF THE ICE PROTECTION SYSTEM, OR MAY RESULT IN ICE FORMING AFT OF THE PROTECTED SURFACES. THIS ICE MAY NOT SHED WHEN THE ICE PROTECTION SYSTEMS ARE USED, AND MAY SERIOUSLY DEGRADE THE PERFORMANCE AND CONTROLLABILITY OF THE AIRPLANE.

All wing icing inspection lights must be operative prior to flight into known or forecast icing conditions at night.

NOTE: This supersedes relief provided by the Master Minimum Equipment List.

Severe icing conditions that exceed those for which the airplane is certificated shall be determined by the following visual cues:

1. Unusually extensive ice accumulation on the airframe and windshield in areas not normally observed to collect ice.
2. Accumulation of ice on the upper surface of the wing aft of the protected area.

If one or more of these visual cues exist

1. Use of the autopilot is prohibited.
2. Immediately request priority handling from Air Traffic Control to facilitate a route or altitude change to exit the icing conditions.
3. Leave flaps in current position, do not extend or retract.
4. Avoid abrupt and excessive maneuvering that may exacerbate control difficulties.
5. If unusual or uncommanded roll control movement is observed, reduce angle-of-attack.

Since the autopilot, when installed and operating , may mask tactile cues that indicate adverse changes in handling characteristics, use of the autopilot is prohibited when:

1. Unusual lateral trim is required while the airplane is in icing conditions.
2. Autopilot trim warnings are encountered while the airplane is in icing conditions.

Kinds of Operations Equipment List

This airplane may be operated in day or night VFR or IFR and flight into known icing conditions when the appropriate equipment is installed.

The following equipment list identifies the systems and equipment upon which type certification for each kind of operation was predicated. The systems and items of equipment listed must be installed and operable unless:

1. The airplane is approved to be operated in accordance with a current Minimum Equipment List (MEL) issued by the FAA.

or

2. An alternate procedure is provided in the FAA Approved Airplane Flight Manual for the inoperative state of the listed equipment and all limitations are complied with.

NOTE: The following systems and equipment list does not include all equipment required by the FAR Parts 91 and 135 Operating Requirements. It also does not include components obviously required for the airplane to be airworthy such as wings, primary flight controls, empennage, engine, etc.

Kinds of Operations Equipment List (Continued)

System and/or Component	Kind of Operation					Comments
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
Avionics						
1. VHF Transceiver	*	*	1*	1*	1*	* or as required by operating regulation
2. Static Wicks	13*	13*	13*	13*	13*	* 15 total installed; 1 may be missing from any control surface, no more than 2 total may be missing
3. Transponder	*	*	1*	1*	1*	* or as required by operating regulation
4. VHF NAV Receiver	*	*	1*	1*	1*	* or as required by operating regulation
5. Cockpit Voice Recorder	*	*	*	*	*	* Required for two pilot operations with six passenger seats installed
Electrical						
1. Battery	1	1	1	1	1	
2. Battery Overheat Annunciator	1	1	1	1	1	
3. DC Generator	2	2	2	2	2	
4. DC Generator Annunciator	2	2	2	2	2	
5. DC Loadmeter	2	2	2	2	2	
6. DC Voltmeter and Select Switch	1	1	1	1	1	
Environmental/Pressurization						
1. Bleed Air Shutoff Valve	2	2	2	2	2	
2. Cabin Bleed Air Row Control Valve	1	1	1	1	1	
3. Outflow Valve/Safety Valve	2	2	2	2	2	
4. Primary Door Seal	1	1	1	1	1	
5. Secondary Door Seal	1	1	1	1	1	Required above FL310
6. Pressurization Controller	1	1	1		1	
7. Emergency Press Dump Valve	1	1	1	1	1	

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Kinds of Operations Equipment List (Continued)

System and/or Component	Kind of Operation					Comments
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
Environmental Pressurization (Continued)						
8. Fresh Air Fan	1	1	1	1	1	
9. Defog Fan	1	1	1	1	1	
10. Differential Press/Cabin Altitude Gauge	1	1	1	1	1	
11. Cabin Temperature Control System (except air conditioner)	1	1	1	1	1	
12. Duct Over Temperature Annunciator	1	1	1	1	1	
13. Cabin Altitude Warning System	1	1	1	1	1	Required above FL240
Equipment and Furnishings						
1. Exit Sign (lighted)	2	2	2	2	2	
2. Seat Belt	*	*	*	*	*	* One per occupied seat
3. Shoulder Harness	*	*	*	*	*	* Crew seats and all occupied passenger seats
Fire Protection						
1. Engine Fire Detection System	2	2	2	2	2	
2. Engine Fire Extinguisher System	2	2	2	2	2	
3. Portable Fire Extinguisher	1	1	1	1	1	

Kinds of Operations Equipment List (Continued)

System and/or Component	Kind of Operation					Comments
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
Flight Controls						
1. Flap Position Indicator	1	1	1	1	1	
2. Flap System (including annunciators)	1	1	1	1	1	
3. Trim Tab Position Indicator (rudder, aileron, and elevator)	3	3	3	3	3	
4. Trim Systems (rudder, aileron, and elevator)	3	3	3	3	3	
5. Stick Shaker System	1	1	1	1	1	
6. Speed Brake System (both sides)	1	1	1	1	1	
7. Rudder Bias System	1	1	1	1	1	
Flight/Navigation Instruments						
1. Airspeed Indicator	2	2	2	2	2	Dual PFD or Single PFD & Copilot Airspeed
2. Sensitive Altimeter	2	2	2	2	2	Dual PFD or Single PFD & Copilot Altimeter
3. Single PFD (Primary Flight Display)	1*	1*	1*	1*	1*	* Includes AHRS 1 & 2, ADC 1
4. Dual PFD (Primary Flight Display)	2*	2*	2*	2*	2*	* Includes AHRS 1 & 2, ADC 1 & 2
5. MFD (Multi-Function Display)	1	1	1	1	1	
6. Vertical Speed Indicator	0	0	2	2	2	
7. Standby Altimeter/Airspeed	1	1	1	1	1	
8. Standby NAV 1 HSI	1	1	1	1	1	
9. Standby Attitude Indicator	1	1	1	1	1	
10. Copilot's Attitude Indicator	1	1	1	1	1	Applicable to Single PFD installations
11. Copilot's HSI Indicator	1	1	1	1	1	Applicable to Single PFD installations
12. Clock	0	0	1	1	1	
13. Magnetic Compass	1	1	1	1	1	

Kinds of Operations Equipment List (Continued)

System and/or Component	Kind of Operation					Comments
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
Fuel/Engine						
1. Fuel Boost Pumps (including annunciators)	2	2	2	2	2	
2. Fuel Row Indicator System**	2	2	2	2	2	
3. Fuel Quantity System **	2	2	2	2	2	
4. Fuel Transfer System (including annunciator)	1	1	1	1	1	
5. Firewall Shutoff System	2	2	2	2	2	
6. Fuel Low Level Annunciators	2	2	2	2	2	
7. Fuel Low Pressure Annunciators	2	2	2	2	2	
8. Engine Driven Fuel Pump	2	2	2	2	2	
9. Dual Igniter System, Each Engine (including indicator lights)	2	2	2	2	2	
10. Engine Indicators (N_1 ITT, N_2, Oil Pressure, and Oil Temperature)**	2	2	2	2	2	
11. Engine Oil Pressure Annunciators	2	2	2	2	2	
12. Hydraulic Pressure On Annunciator	1	1	1	1	1	
13. Hydraulic Row Low Annunciators	2	2	2	2	2	
14. Thrust Attenuators	2	2	2	2	2	
15. Standby N_1 Indicator	1	1	1	1	1	

** These items are part of the Engine Indicating System (EIS) displayed on the MFD.

Kinds of Operations Equipment List (Continued)

System and/or Component	Kind of Operation					Comments
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
Ice and Rain Protection						
1. Engine Anti-Ice System (including annunciators)	2	2	2	2	2	
2. Wing Anti-Ice System (including annunciators)	0	0	0	0	0	
3. Windshield Anti-Ice System (including annunciators and including rain removal doors)	1*	1*	1*	1*	2	* Pilot's required for ground defog and rain removal
4. Pitot-Static and AOA Heat (including annunciators)	2*	2*	2*	2*	2*	* Single AOA system
5. Tail Deice System (including annunciators)	0	0	0	0	1	
6. Glareshield Ice Detect Lights	0	0	0	2*	2*	* Required for night ice detection
Landing Gear/Brakes						
1. Landing Gear Position Indicator	3	3	3	3	3	
2. Unsafe Indicator	1	1	1	1	1	
3. Landing Gear Aural Warning System	1	1	1	1	1	
4. Emergency Extension System	1	1	1	1	1	
5. Power Brake System	1	1	1	1	1	
6. Antiskid System (including annunciator)	1	1	1	1	1	
7. Emergency Brake System	1	1	1	1	1	

Kinds of Operations Equipment List (Continued)

System and/or Component	Kind of Operation					Comments
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
Lighting						
1. Cockpit and Instrument Light System	0	1	0	1	0	
2. Landing Light	0	2	0	2	0	
3. Navigation Light	0	3	0	3	0	
4. Anti-collision Light (Wing Tip Strobe)	0	2	0	2	0	
5. Wing Inspection Light	0	0	0	1*	1*	* Required for night ice detection
6. Passenger Safety System	1	1	1	1	1	
Oxygen						
1. Oxygen System Including Pressure Gauge	1	1	1	1	1	Required if unpressurized or if flight is above FL240
2. Passenger Masks	*	*	*	*	*	* If any passenger seat is occupied, the number of installed masks must equal the number of installed passenger seats plus one
3. Crew Oxygen Mask	2*	2*	2*	2*	2*	* One for each occupied crew seat
Warning/Caution						
1. Annunciator Panel	1	1	1	1	1	
2. Master Caution	1	1	1	1	1	Pilot's is required for single pilot operations; both required for two crew
3. Master Warning	1	1	1	1	1	Pilot's is required for single pilot operations; both required for two crew
4. Audio Warnings (red annunciators, engine fire, dual generator fail, autopilot, minimums, altitude, and landing gear)	*	*	*	*	*	* All audio warnings are required (Verbal Warning System)

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Kinds of Operations Equipment List (Continued)

System and/or Component	Kind of Operation					Comments
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
Warning/Caution (Continued)						
or						
4. Tone Warnings (autopilot, minimums, altitude, and landing gear)	*	*	*	*	*	* All audio warnings are required (Tone Warning System)
5. Overspeed Warning System	1	1	1	1	1	
6. Miscellaneous Annunciators, (DME, display fan, nose avionics fan, thrust attenuator stow)	*	*	*	*	*	* All are required
Miscellaneous Equipment						
1. FAA Approved Airplane Flight Manual	1	1	1	1	1	
2. Collins Proline 21 Pilot's Guide	1	1	1	1	1	
3. Approved FMS Pilot's Manual	1	1	1	1	1	
4. Hand Microphones	2	2	2	2	2	
5. Passenger Briefing Cards	*	*	*	*	*	* One required for each occupied seat

Single Pilot

The following are required when the airplane is operated with a crew of one pilot; per applicable operating rules:

1. Operable FCS-3000 Autopilot.
2. Headset with microphone (must be worn).
3. FAA Approved Pilots' Abbreviated Checklist, Cessna PN 525ACL-00 or later approved revision.
4. Provisions for storage and retention of navigation charts, accessible to the pilot from the pilot station.