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 14 CFR, Part 23 Normal Category, Part 34 (Fuel Venting and Exhaust Emissions), Part 36 (Noise Requirements) and Special Conditions as prescribed by the Administrator.

OPERATIONS AUTHORIZED

This airplane is approved for day and night, VFR and IFR operations and flight into known icing conditions when the required equipment is installed as defined within the Kinds of Operations Equipment List.

This airplane is approved for operations in Reduced Vertical Separation Minimum (RVSM) airspace when required equipment is maintained in accordance with the airplane Maintenance Manual. This does not constitute operational approval. Operational approval must be obtained in accordance with applicable operating rules.

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

WEIGHT LIMITATIONS

Maximum Design Ramp Weight . . . . . 8730 Pounds
Maximum Design Takeoff Weight . . . . . 8645 Pounds
Maximum Design Landing Weight . . . . . 8000 Pounds
Maximum Design Zero Fuel Weight . . . . . 6750 Pounds
Minimum Weight in RVSM Airspace . . . . . 6300 Pounds

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

Maximum Certified Takeoff Weight (Flaps - TAKEOFF/APPROACH). . . . . 8645 Pounds
Maximum Takeoff Weight Permitted by
Climb Requirements . . . . . Refer to Section IV, Performance, TAKEOFF
Takeoff Field Length . . . . . Refer to Section IV, Performance, TAKEOFF

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

Maximum Certified Landing Weight . . . . . 8000 Pounds
Maximum Landing Weight Permitted by Climb Requirements
or Brake Energy Limits . . . . . Refer to Section IV, Performance, APPROACH AND LANDING
Landing Distance . . . . . Refer to Section IV, Performance, APPROACH AND LANDING

CENTER-OF-GRAVITY LIMITS

Center-of-Gravity Moment Envelope . . . . . Refer to Figure 2-1

WEIGHT AND BALANCE DATA

The airplane must be operated in accordance with the approved loading schedule. Refer to the Model 510 Weight and Balance Manual (510WB-00 or latest revision).

POWERPLANT LIMITATIONS

Engine Type . . . . . .Pratt and Whitney Canada Inc. PW615F-A Turbofan
Engine Operating Limits . . . . . Refer to Figures 2-2
Engine Inter-Turbine Temperature (ITT) Limits. . . . . Refer to Figures 2-3 and 2-4
Engine Overspeed Limits . . . . . Refer to Figures 2-5 and 2-6
Engine Oil Pressure Limits . . . . . Refer to Figure 2-7
Takeoff/Go-Around Thrust (TO Detent). . . . . Refer to Figures 4-13 and 4-14
Maximum Continuous Thrust, Single-Engine (CLB Detent) . . . . . Refer to Figures 4-15 and 4-16
Maximum Continuous Thrust, Multi-Engine (CLB Detent) . . . . . Refer to Figures 4-17 and 4-18

ENGINE START LIMITATIONS

Inter-Turbine Temperature (ITT) Limits . . . . . Refer to Figure 2-3
Maximum Tailwind Component . . . . . 10 Knots
Maximum Quartering Tailwind (within Tailwind component limits) . . . . . 15 Knots
Maximum Crosswind Component . . . . . 25 Knots
Maximum Time to Light-off . . . . . 10 Seconds
Maximum Time to Stabilized Idle (Ground or Inflight/Starter Assist). . . . . 45 Seconds
Maximum Time to Stabilized Idle (Inflight/Windmilling). . . . . 90 Seconds

NOTE

Time to light-off is defined as the time after the throttle lever is moved from CUTOFF to IDLE position and an increase in ITT is observed.

Minimum Engine Oil Temperature (as indicated on EICAS) . . . . . -40°C

NOTE

- If engine oil temperature is below -40°C (-40°F), the engine must be preheated prior to conducting a start.
- If the battery has been cold soaked for 2 hours or longer at ambient surface temperature of -10°C (14°F) or lower, it must be preheated to above -18°C (0°F) prior to start.
- The Engine Indicating System may take up to 10 minutes to become usable after power is applied when cold soaked below -40°C (-40°F).

Maximum Temperature For Engine Start . . . . . Refer to Figure 2-13
Maximum Airport Elevation For Ground Battery Start. . . . . 10,000 Feet
Maximum Airport Elevation For Ground Power Unit Start. . . . . 10,000 Feet
Minimum Battery Voltage For Battery Start. . . . . .22 Volts

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 14 CFR, Part 23 Normal Category, Part 34 (Fuel Venting and Exhaust Emissions), Part 36 (Noise Requirements) and Special Conditions as prescribed by the Administrator.

OPERATIONS AUTHORIZED

This airplane is approved for day and night, VFR and IFR operations and flight into known icing conditions when the required equipment is installed as defined within the Kinds of Operations Equipment List.

This airplane is approved for operations in Reduced Vertical Separation Minimum (RVSM) airspace when required equipment is maintained in accordance with the airplane Maintenance Manual. This does not constitute operational approval. Operational approval must be obtained in accordance with applicable operating rules.

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

WEIGHT LIMITATIONS

Maximum Design Ramp Weight	8730 Pounds
Maximum Design Takeoff Weight	8645 Pounds
Maximum Design Landing Weight	8000 Pounds
Maximum Design Zero Fuel Weight	6750 Pounds
Minimum Weight in RVSM Airspace	6300 Pounds

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

Maximum Certified Takeoff Weight (Flaps - TAKEOFF/APPROACH)	8645 Pounds
Maximum Takeoff Weight Permitted by	
Climb Requirements	Refer to Section IV, Performance, TAKEOFF
Takeoff Field Length	Refer to Section IV, Performance, TAKEOFF

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

Maximum Certified Landing Weight	8000 Pounds
Maximum Landing Weight Permitted by Climb Requirements	
or Brake Energy Limits	Refer to Section IV, Performance, APPROACH AND LANDING
Landing Distance	Refer to Section IV, Performance, APPROACH AND LANDING

CENTER-OF-GRAVITY LIMITS

Center-of-Gravity Moment Envelope . . . . . Refer to Figure 2-1

WEIGHT AND BALANCE DATA

The airplane must be operated in accordance with the approved loading schedule. Refer to the Model 510 Weight and Balance Manual (510WB-00 or latest revision).

POWERPLANT LIMITATIONS

Engine Type . . . . . .Pratt and Whitney Canada Inc. PW615F-A Turbofan
Engine Operating Limits . . . . . Refer to Figures 2-2
Engine Inter-Turbine Temperature (ITT) Limits. . . . . Refer to Figures 2-3 and 2-4
Engine Overspeed Limits . . . . . Refer to Figures 2-5 and 2-6
Engine Oil Pressure Limits . . . . . Refer to Figure 2-7
Takeoff/Go-Around Thrust (TO Detent). . . . . Refer to Figures 4-13 and 4-14
Maximum Continuous Thrust, Single-Engine (CLB Detent) . . . . . Refer to Figures 4-15 and 4-16
Maximum Continuous Thrust, Multi-Engine (CLB Detent) . . . . . Refer to Figures 4-17 and 4-18

ENGINE START LIMITATIONS

Inter-Turbine Temperature (ITT) Limits . . . . . Refer to Figure 2-3
Maximum Tailwind Component . . . . . 10 Knots
Maximum Quartering Tailwind (within Tailwind component limits) . . . . . 15 Knots
Maximum Crosswind Component . . . . . 25 Knots
Maximum Time to Light-off . . . . . 10 Seconds
Maximum Time to Stabilized Idle (Ground or Inflight/Starter Assist). . . . . 45 Seconds
Maximum Time to Stabilized Idle (Inflight/Windmilling). . . . . 90 Seconds

NOTE

Time to light-off is defined as the time after the throttle lever is moved from CUTOFF to IDLE position and an increase in ITT is observed.

Minimum Engine Oil Temperature (as indicated on EICAS) . . . . . -40°C

NOTE

- If engine oil temperature is below -40°C (-40°F), the engine must be preheated prior to conducting a start.
- If the battery has been cold soaked for 2 hours or longer at ambient surface temperature of -18°C (0°F) or lower, it must be preheated to above -18°C (0°F) prior to start.
- The Engine Indicating System may take up to 10 minutes to become usable after power is applied when cold soaked below -40°C (-40°F).

Maximum Temperature For Engine Start . . . . . Refer to Figure 2-13
Maximum Airport Elevation For Ground Battery Start. . . . . 10,000 Feet
Maximum Airport Elevation For Ground Power Unit Start. . . . . 10,000 Feet
Minimum Battery Voltage For Battery Start. . . . . .24 Volts

CENTER-OF-GRAVITY LIMITS

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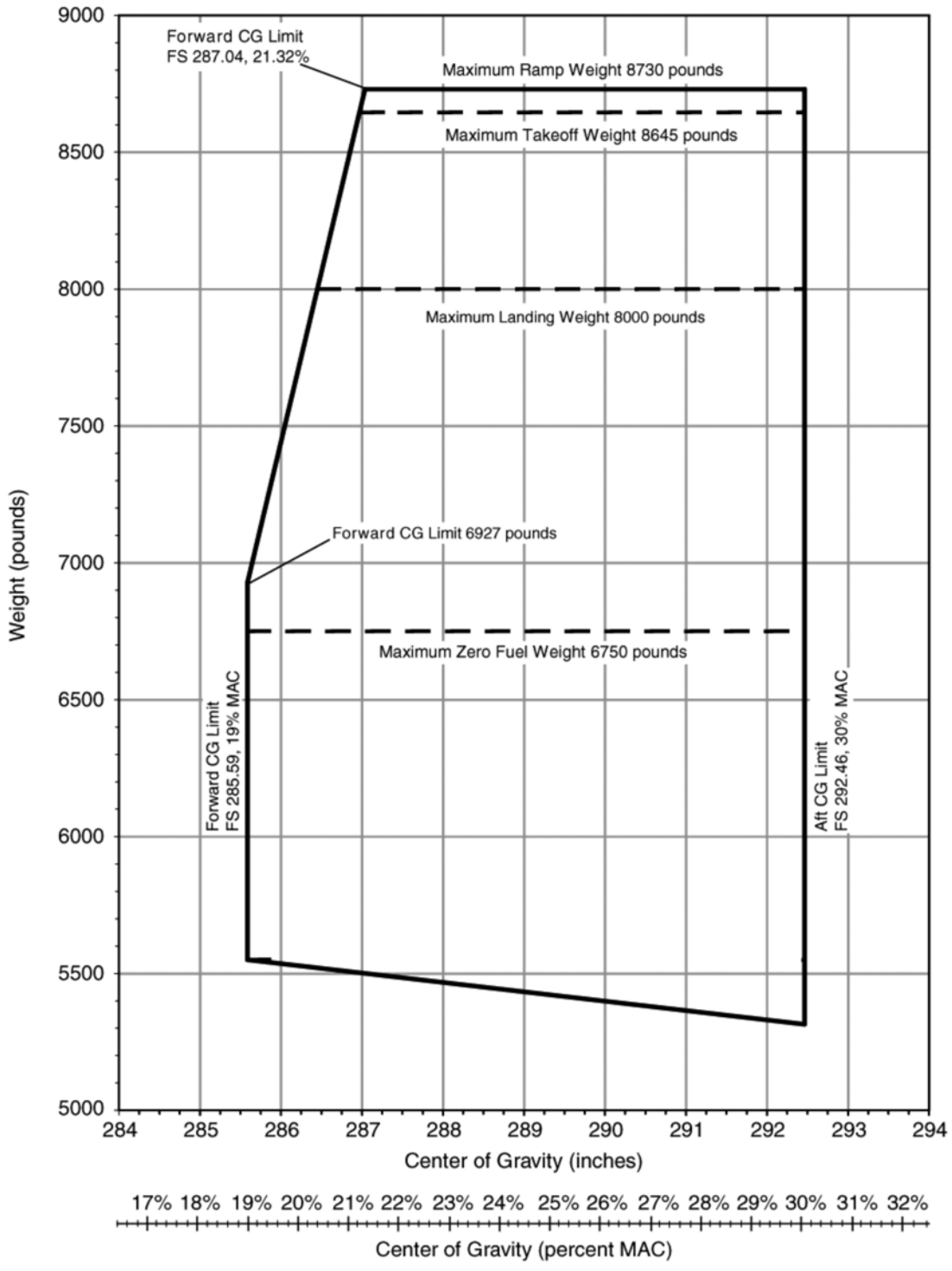

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Figure 2-1

ENGINE OPERATING LIMITS

OPERATING CONDITION	OPERATING LIMITS					
THRUST SETTING	TIME LIMIT (MINUTES)	ITT TEMPERATURE °C	N_2%	N_1%	OIL PRESSURE PSI	OIL TEMPERATURE °C
START	---	862 SEE FIGURE 2-3	---	---	0 TO 250 (NOTE 5)	-40 MINIMUM
GND IDLE	CONTINUOUS	---	48.6	---	24 MINIMUM	-40 TO 135 (NOTE 3)
FLT IDLE	CONTINUOUS	---	56.8 (MINIMUM) (NOTE 4)	---	SEE FIGURE 2-7	22 TO 135
TAKEOFF (TO DETENT)	5 (NOTE 1)	830	100.0	100.0 (NOTE 1)	SEE FIGURE 2-7	22 TO 135 (NOTE 3)
MAXIMUM CONTINUOUS (CLB DETENT)	CONTINUOUS	830	100.0	100.0 (NOTE 2)	SEE FIGURE 2-7	22 TO 135
MAXIMUM CRUISE (CRU DETENT)	CONTINUOUS	830	100.0	100.0	SEE FIGURE 2-7	22 TO 135
TRANSIENT	20 SECONDS	862 SEE FIGURE 2-4	102.0 SEE FIGURE 2-5	101.0 SEE FIGURE 2-6	---	---
	90 SECONDS	---	---	---	SEE FIGURE 2-7	135 TO 141
	15 / 500 SECONDS	---	---	---	SEE FIGURE 2-7	---

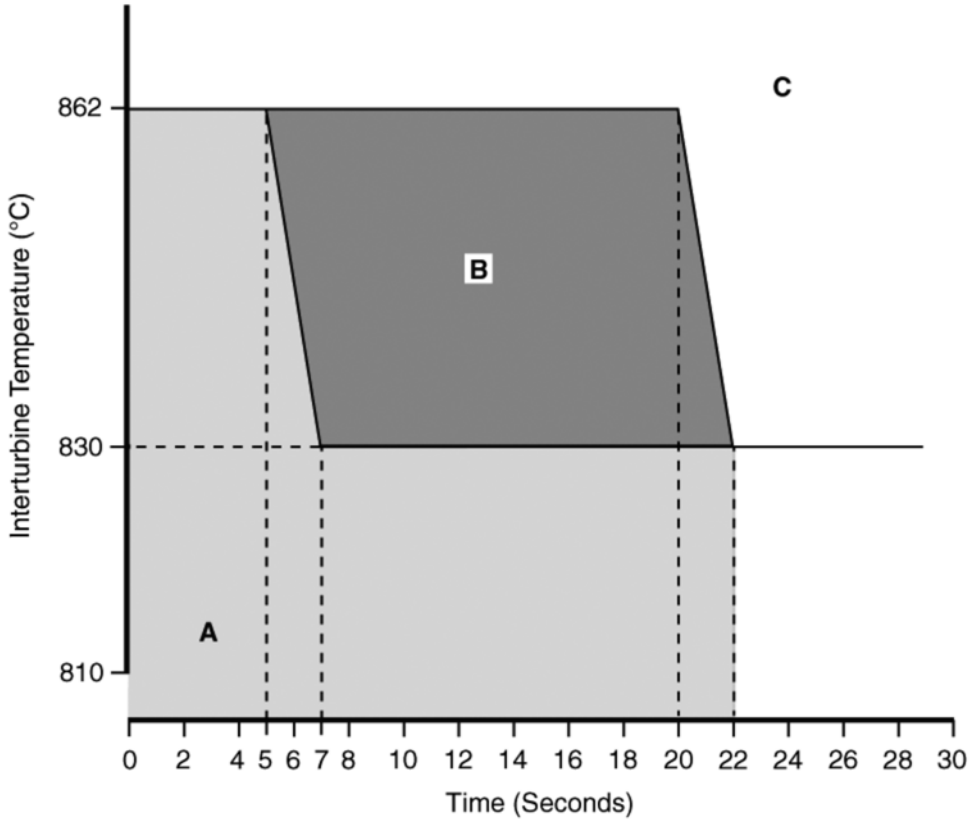
Figure 2-2

NOTE

1. The total time during which takeoff thrust may be used is limited to five minutes per flight. The five minute time limit commences when the throttle is first advanced to the TO detent. This time may be extended to 10 minutes for one engine inoperative operation. The takeoff thrust (N_1) for the airplane is defined in Figures 4-13 and 4-14 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 appropriate Takeoff Thrust setting.
2. Maximum continuous thrust (CLB Detent) for the airplane is defined by Figures 4-15 and 4-16 (single-engine) and Figures 4-17 and 4-18 (multi-engine). These thrust settings (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 maximum continuous thrust setting.
3. Oil temperature must be above 22°C for at least 5 minutes before takeoff. Once oil temperature is +10°C or warmer, it is acceptable to increase power up to the CRU detent to decrease the time required to warm the oil to 22°C.
4. Idle speed is a function of ambient pressure and temperature.
5. After initiation of the start cycle, oil pressure should indicate a steady increase within 20 seconds of the start of N_2 rotation.

OVER TEMPERATURE LIMITS - STARTING

A63476



Area A - No Action Required

Area B - (1) Determine Cause and Correct
(2) Inspect Hot Section Using Borescope
(3) Report Incident in Engine Log Book

Area C - Refer to Pratt and Whitney PW615F-A Maintenance Manual

Figure 2-3*

OVER TEMPERATURE LIMITS - EXCEPT STARTING

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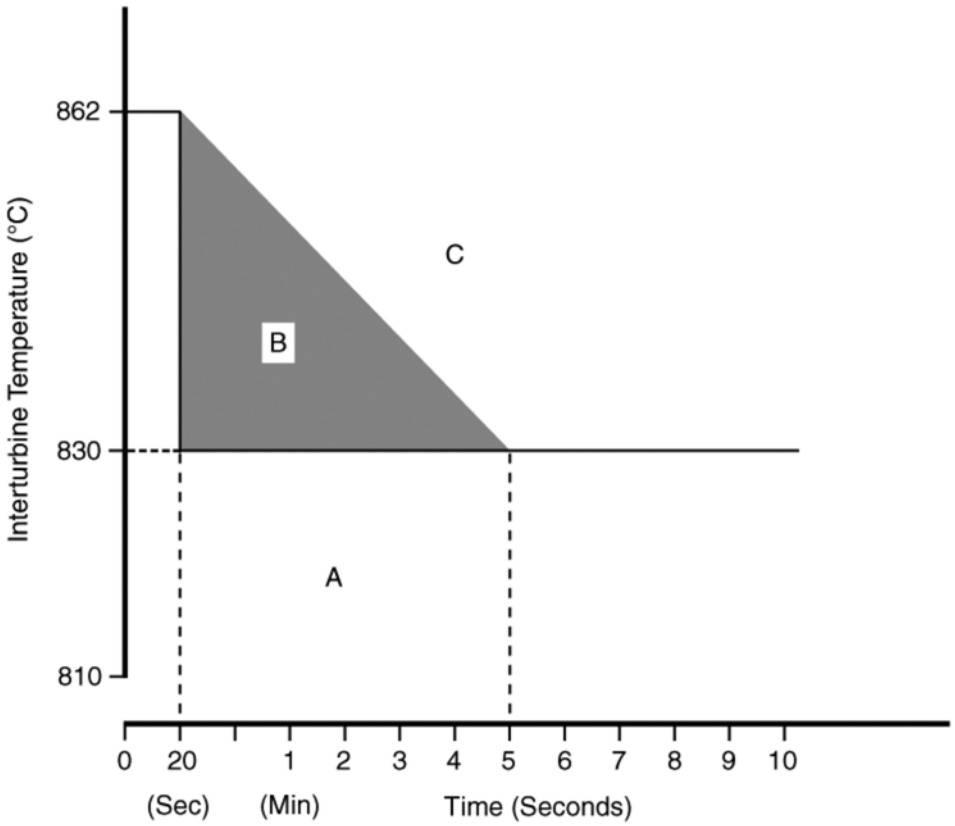

Area A - No Action Required

Area B - (1) Determine Cause and Correct
(2) Inspect Hot Section Using Borescope
(3) Report Incident in Engine Log Book

Area C - Refer to Pratt and Whitney PW615F-A Maintenance Manual

Figure 2-4*

N_2 ENGINE OVERSPEED LIMITS

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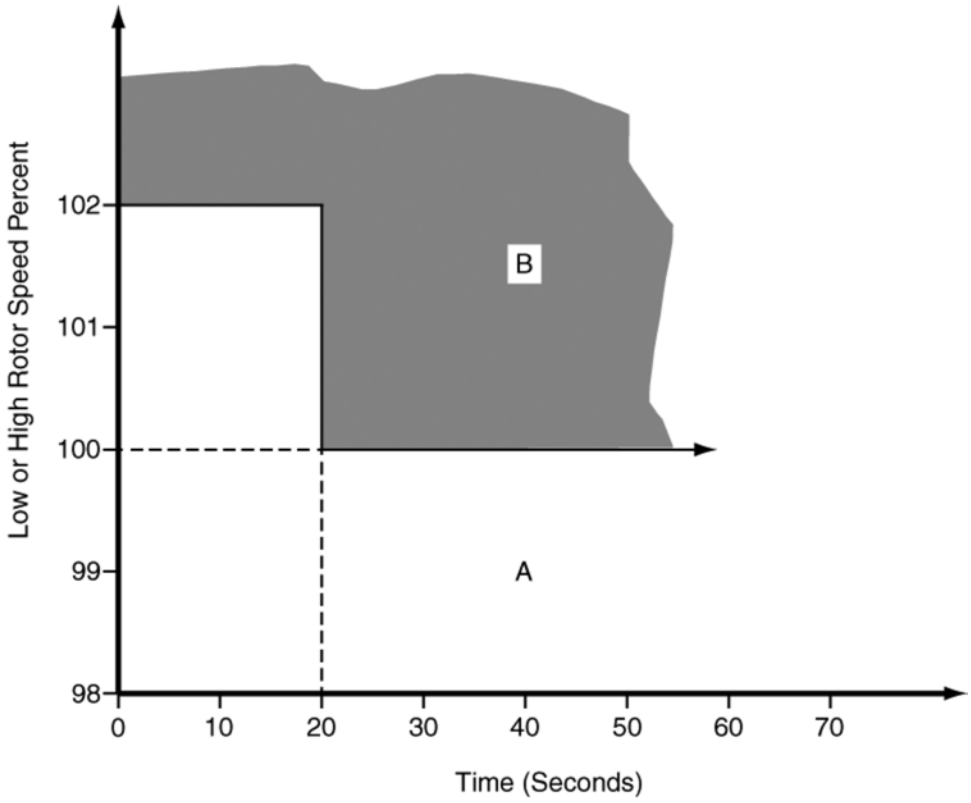

Area A - No Action Required

Area B - Refer to Pratt and Whitney PW615F-A Maintenance Manual

Figure 2-5*

N_1 ENGINE OVERSPEED LIMITS

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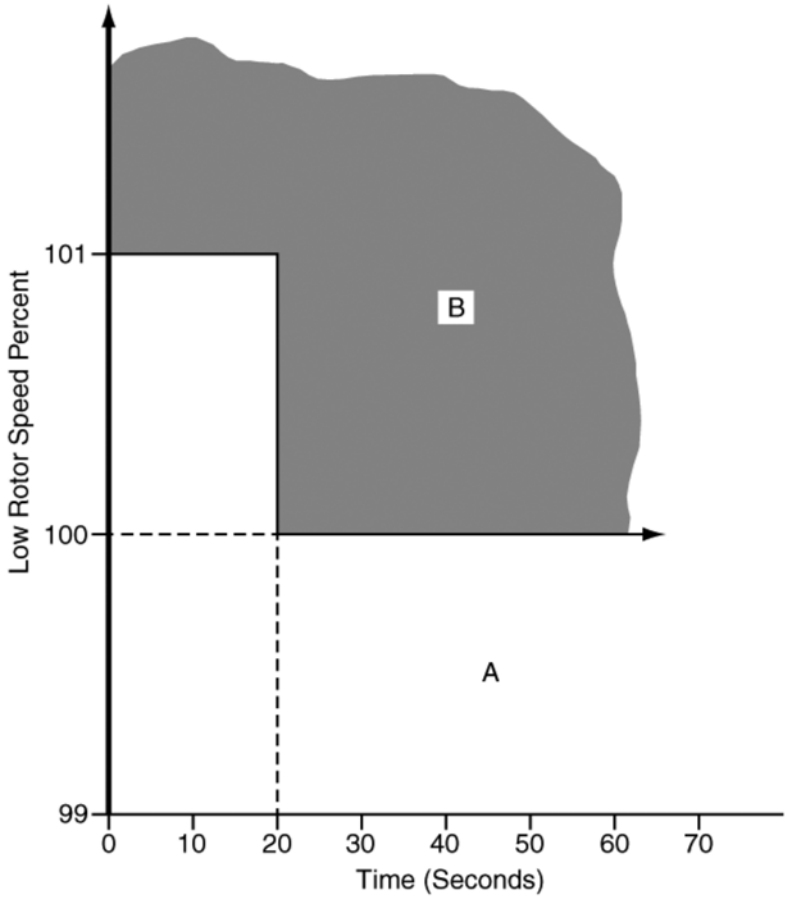

Area A - No Action Required

Area B - Refer to Pratt and Whitney PW615F-A Maintenance Manual

Figure 2-6*

ENGINE OIL PRESSURE LIMITS

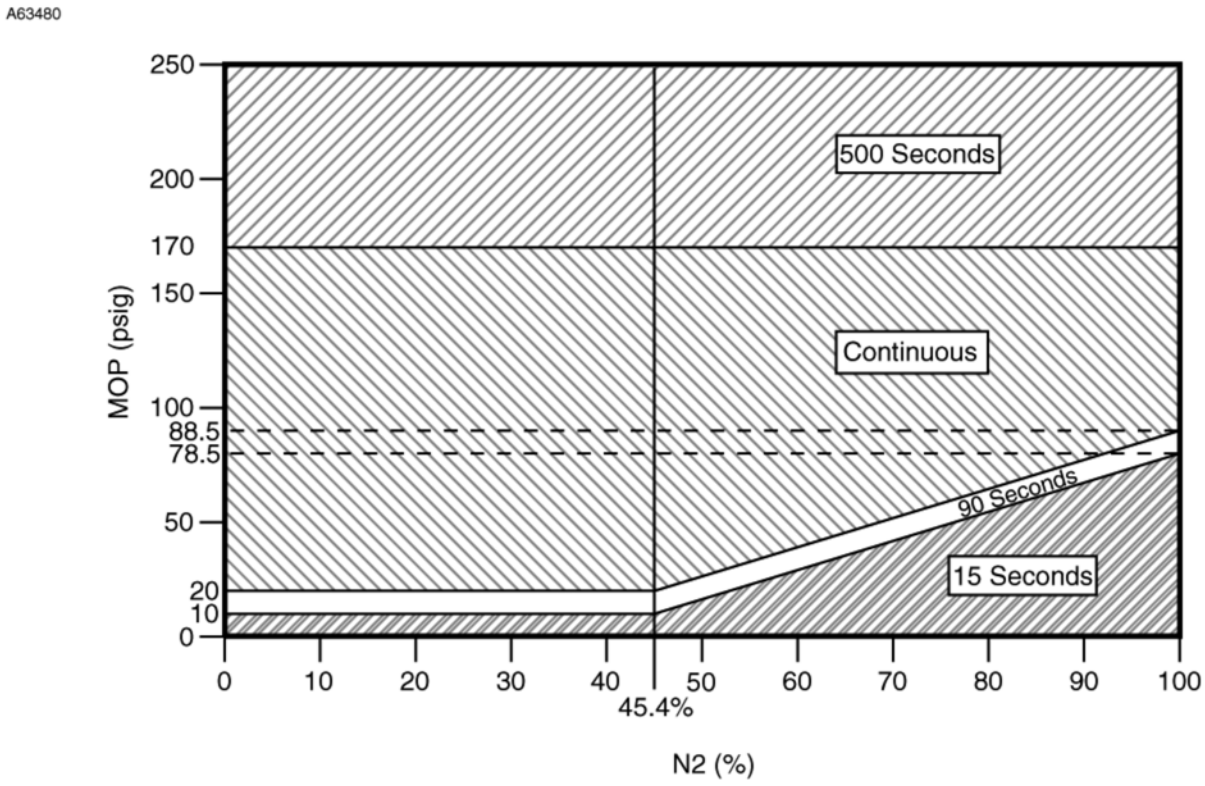

Figure 2-7

ENGINE START LIMITATIONS (Air)

Inter-Turbine Temperature (ITT) Limits . . . . . Refer to Figure 2-3
Airspeed/Altitude Limits . . . . . Refer to Figure 3-1
Minimum Temperature for Windmill Start . . . . . -10°C RAT

STARTER CYCLE LIMITATIONS

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

NOTE

This limitation is independent of starter power source (i.e. battery, generator assisted cross start, or ground power unit) and applies to both starting and dry motoring of the engine.

GROUND POWER UNIT LIMITATIONS FOR STARTING

Minimum/Maximum Current . . . . . 800/1100 Amperes
Maximum Voltage . . . . . .29 VDC

CAUTION

NORMAL STARTER CURRENT DRAW IS APPROXIMATELY 1000 AMPERES PEAK. GROUND POWER UNITS WITH VARIABLE MAXIMUM CURRENT SHUTOFF SHOULD BE SET TO 1100 AMPERES. USE OF AN GROUND POWER SOURCE WITH VOLTAGE IN EXCESS OF 29 VDC OR CURRENT IN EXCESS OF 1100 AMPS MAY DAMAGE THE STARTER.

BATTERY LIMITATIONS

Battery Start Limitation . . . . . Three engine starts per hour
Minimum Voltage for Start. . . . . .22 Volts

If the BATTERY O'TEMP message displays during ground operations, dispatch is prohibited until after the proper maintenance procedures have been accomplished.

NOTE

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

FADEC (FULL AUTHORITY DIGITAL ENGINE COMPUTERS)

Dispatch with an engine FADEC fault (ENG CTRL SYS L or R message displayed) is prohibited.

ENGINE FAN INSPECTION

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

ENGINE OIL PRESSURE LIMITS

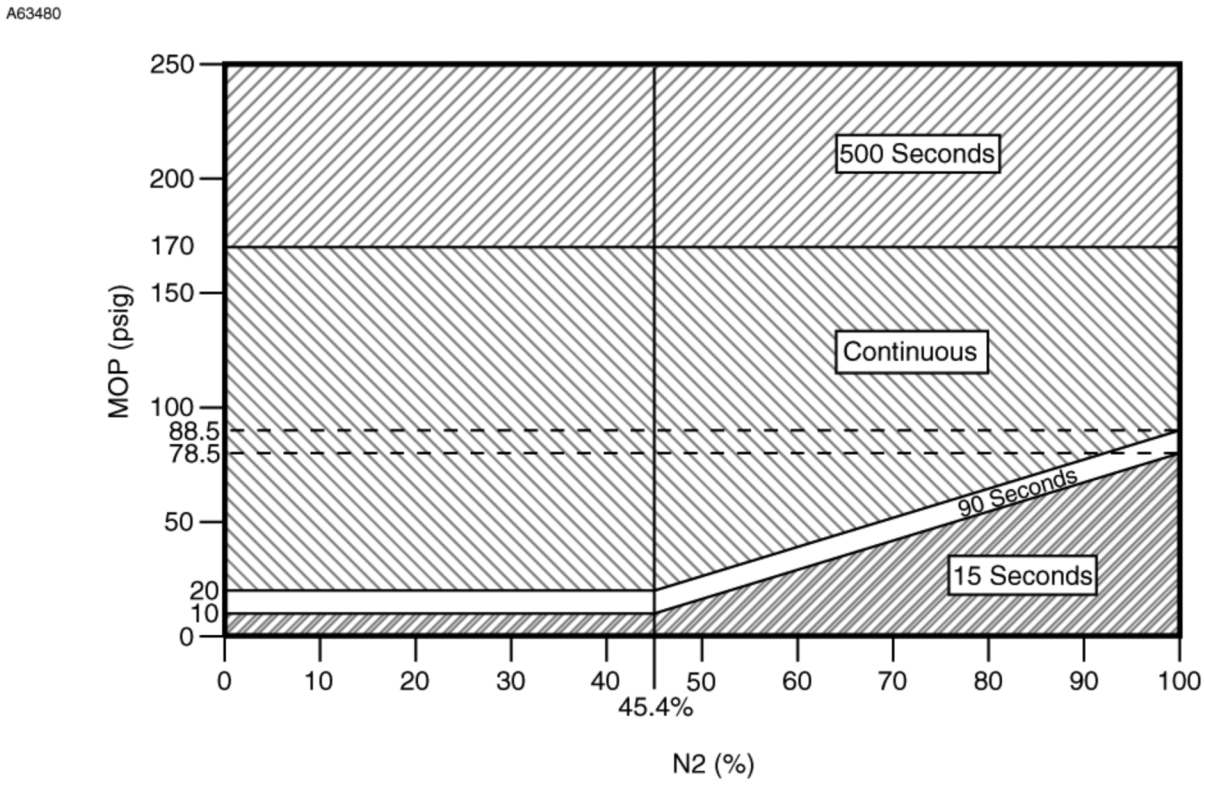

Figure 2-7

ENGINE START LIMITATIONS (Air)

Inter-Turbine Temperature (ITT) Limits . . . . . Refer to Figure 2-3
Airspeed/Altitude Limits . . . . . Refer to Figure 3-1
Minimum Temperature for Windmill Start . . . . . -10°C RAT

STARTER CYCLE LIMITATIONS

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

NOTE

This limitation is independent of starter power source (i.e. battery, generator assisted cross start, or ground power unit) and applies to both starting and dry motoring of the engine.

GROUND POWER UNIT LIMITATIONS FOR STARTING

Minimum/Maximum Current . . . . . 800/1100 Amperes
Maximum Voltage . . . . . .29 VDC

CAUTION

NORMAL STARTER CURRENT DRAW IS APPROXIMATELY 1000 AMPERES PEAK. GROUND POWER UNITS WITH VARIABLE MAXIMUM CURRENT SHUTOFF SHOULD BE SET TO 1100 AMPERES. USE OF AN GROUND POWER SOURCE WITH VOLTAGE IN EXCESS OF 29 VDC OR CURRENT IN EXCESS OF 1100 AMPS MAY DAMAGE THE STARTER.

BATTERY LIMITATIONS

Battery Start Limitation . . . . . Three engine starts per hour
Minimum Voltage for Start. . . . . .24 Volts

NOTE

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

FADEC (FULL AUTHORITY DIGITAL ENGINE COMPUTERS)

Dispatch with an engine FADEC fault (ENG CTRL SYS L or R message displayed) is prohibited.

ENGINE FAN INSPECTION

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

GROUND OPERATION

Continuous engine ground static operation up to and including five minutes at takeoff thrust is limited to ambient temperatures defined in Figure 2-13.

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

Movement of the flaps is prohibited at temperatures colder than -40°C.

ELECTRICAL POWER SYSTEM

Generator limits are as listed in Figure 2-8.

STATUS	LIMIT
On Ground, Idle	150 Amps
On Ground, Above Idle	300 Amps
Air $\leq$ 30,000 Feet	300 Amps
Air > 30,000 Feet	280 Amps

Figure 2-8

HYDRAULIC POWER SYSTEM

The only approved hydraulic fluid for the hydraulic power system is MIL-PRF-87257.

LANDING GEAR AND TIRE LIMITATIONS

The only approved hydraulic fluid for the landing gear struts is MIL-PRF-87257.

The tires listed in Figure 2-9 are the only tires approved. Tires must be inflated to the pressure shown.

POSITION	VENDOR	PART NUMBER	UNLOADED PRESSURE	LOADED PRESSURE
Nose Tire	Michelin	079-606-0	120±5 PSIG	125±5 PSIG
	Dunlop	DR17026T	120±5 PSIG	125±5 PSIG
Main Tires	Michelin	021-523-0	85±5 PSIG	88±5 PSIG
	Dunlop	DR25526T	85±5 PSIG	88±5 PSIG

NOTE

If the ground operating temperature is expected to drop more than 28°C (50°F) or the arrival airfield is expected to be more than 28°C (50°F) colder than the departure airfield, refer to the Airplane Maintenance Manual for tire servicing.

Figure 2-9*

FUEL LIMITATIONS

The corresponding electric fuel boost pump must be turned ON when the FUEL LO L-R CAS message is displayed or at 170 pounds or less of indicated fuel in either tank.

Maximum approved fuel imbalance is 200 lbs. A emergency fuel imbalance of 600 pounds has been demonstrated for safe return and landing.

Minimum fuel quantity for takeoff is 200 lbs. per wing.

Figure 2-10 lists the fuel temperature limitations for each approved fuel.

GRADE (TYPE)	SPECIFICATION	MINIMUM FUEL TEMPERATURE °C (°F)
JET A, JET A-1	ASTM-D1655	-35 (-31)
JP-8	MIL-T-83133	-35 (-31)

NOTE

- The fuel tank temperature indication on EICAS does not monitor for fuel temperature out of limits.
- Dupont Stadis 450 antistatic additive or equivalent is permitted to bring fuel up to 300 conductive units, but not to exceed 3 ppm (parts per million) by weight.
- SOHIO Biobor JF biocide additive is approved at a concentration not to exceed 270 ppm by weight.
- EGME/DIEGME anti-icing additive is approved for use, but not required, at a concentration not to exceed 0.15% by volume. Refer to Normal Procedures, ANTI-ICE ADDITIVES for blending instructions.

Figure 2-10

UNUSABLE FUEL

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

APPROVED OILS

The following oils are approved for use:

MOBIL JET OIL II	AIR BP / EXXON 2380
MOBIL JET OIL 254*	AIR BP / EXXON 2197*
ROYCO TURBINE OIL 500	AEROSHELL TURBINE OIL 500
ROYCO TURBINE OIL 560*	AEROSHELL TURBINE OIL 560*
TurboNycoil TN 600	CASTROL 5000

* Oils denoted with an asterisk are "THIRD GENERATION" lubricants.

In addition, oils listed for the engine in the latest revision to PW615F Maintenance Manual (P/N 3059712) are approved.

CAUTION

WHEN CHANGING FROM AN EXISTING LUBRICANT FORMULATION TO A "THIRD GENERATION" LUBRICANT FORMULATION, THE ENGINE MANUFACTURER STRONGLY RECOMMENDS THAT SUCH A CHANGE SHOULD ONLY BE MADE WHEN AN ENGINE IS NEW OR FRESHLY OVERHAULED. FOR ADDITIONAL INFORMATION ON USE OF THIRD GENERATION OILS, REFER TO ENGINE MANUFACTURER'S PERTINENT OIL SERVICE BULLETINS.

Figure 2-11

Maximum oil consumption is 1 U.S. quart per 13.5 hour period. If oil consumption exceeds this amount, refer to the Pratt and Whitney PW615F-A Maintenance manual.

The oil level must be serviced to the MAX indication on the sight glass for any flight planned to exceed 5 hours in duration.

Should it be necessary to replenish oil consumption losses when oil of the same brand (as tank contents) is unavailable, then the following requirements apply:

For contingency purposes, oil replenishment using any other approved oil brand listed is acceptable provided:

1. The total quantity of added oil does not exceed two U.S. quarts in any 400-hour period.
2. If it is required to add more than two U.S. quarts of dissimilar oil brands, drain and flush complete oil system and refill with an approved oil in accordance with Engine Maintenance Manual instructions.

Should oils of non-approved brands or of different viscosities become intermixed, drain and flush complete oil system and refill with an approved oil in accordance with Engine Maintenance Manual instructions.

SPEED LIMITATIONS

Maximum Operating Limit Speeds

V_{MO} (Between Sea Level and 27,120 Feet) . . . . . 250 KIAS
M_{MO} (Above 27,120 Feet) . . . . . .0.63 Mach (Indicated)

NOTE

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 Operating Maneuvering Speeds - V_O. . . . . Refer to Figure 2-12

WARNING

AVOID RAPID AND LARGE ALTERNATING CONTROL INPUTS, ESPECIALLY IN COMBINATION WITH LARGE CHANGES IN PITCH, ROLL, OR YAW (I.E., LARGE SIDESLIP ANGLES) AS THEY MAY RESULT IN STRUCTURAL FAILURES AT ANY SPEED, INCLUDING BELOW V_O.

NOTE

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.

EXAMPLE PROBLEM: Refer to Figure 2-12
PRESSURE ALTITUDE - 35,000 FEET
WEIGHT - 8,000 POUNDS
MAXIMUM MANEUVERING SPEED - 158 KNOTS

Maximum Flap Extended Speed - V_{FE}

TAKEOFF / APPROACH Position (15°) . . . . . 185 KIAS
LAND Position (30°) . . . . . 150 KIAS

Maximum Landing Gear Extended Speed - V_{LE}. . . . . 250 KIAS

Maximum Landing Gear Operating Speed - V_{LO} (Extending). . . . . 250 KIAS

Maximum Landing Gear Operating Speed - V_{LO} (Retracting) . . . . . 185 KIAS

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

Maximum Autopilot Operation Speed . . . . . 250 KIAS or 0.63 Mach

Maximum Tire Ground Speed. . . . . 160 Knots

Minimum Speed in RVSM Airspace . . . . . 110 KIAS

Minimum Speed For Sustained Flight In Icing Conditions (Flaps - UP) . . . . . 160 KIAS

Minimum Control Speeds (V_{MCA} and V_{MCG}) . . . . . Refer to Section IV, Performance, GENERAL

MAXIMUM OPERATING MANEUVERING AIRSPEEDS

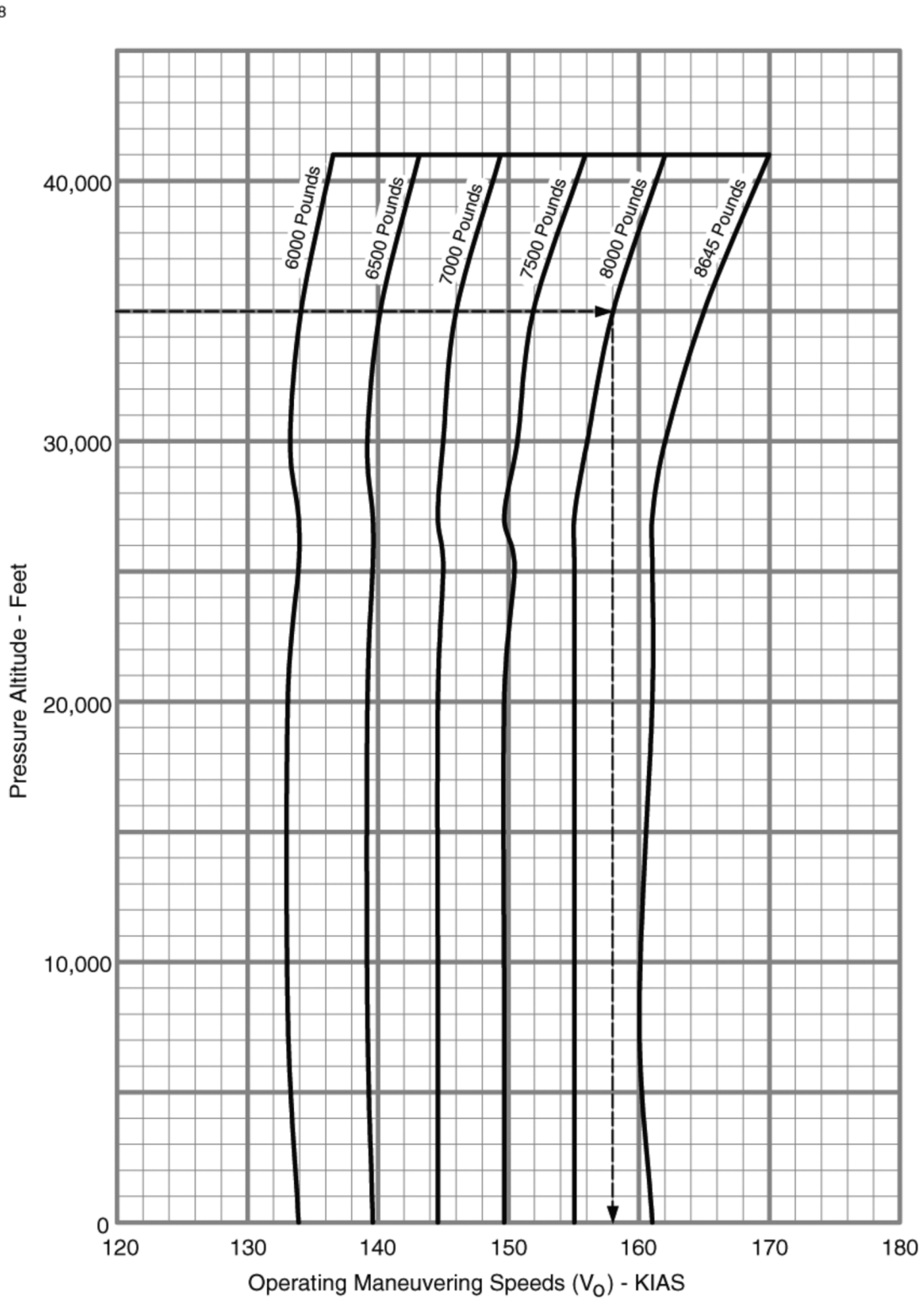

Figure 2-12*

TAKEOFF AND LANDING OPERATIONAL LIMITS

Maximum Altitude Limit. . . . . 10,000 Feet
Maximum Tailwind Component. . . . . 10 Knots
Maximum/Minimum Ambient Temperature . . . . . Refer to Figure 2-13
Maximum Demonstrated Crosswind Component (Not Limiting). . . . . 25 Knots
Minimum Fuel Quantity per Wing for Takeoff . . . . . 200 lbs

The maximum approved fuel imbalance is 200 pounds; however, controllability for safe return and landing has been demonstrated with an emergency fuel imbalance of 600 pounds.

A satisfactory preflight check of each of the following systems must be accomplished in accordance with Section III, Normal Procedures, prior to takeoff:

1. Stall Warning
2. Flight Controls
3. Flaps
4. Standby Instruments

Electric elevator trim system preflight test must be accomplished in accordance with Section III, Normal Procedures prior to takeoff.

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

Dispatch with a ENG CTRL SYS L-R message displayed is prohibited.

Takeoff and landings are limited to paved runway surfaces.

Refer to Section VII for takeoff and landing distance corrections applicable to runway surfaces other than dry.

Dispatch with antiskid inoperative is prohibited if the forecast conditions for the destination approach and landing will require the use of Anti-Ice ON (Flap TO/APR) landing data.

Use of flaps in the LAND position is prohibited with ice adhering anywhere on the outside of the airplane. Anti-Ice ON landing performance data in Section IV is predicated on the use of Flaps TO/APR for landing.

Speed brakes must be retracted prior to 50 feet AGL before landing (unless required by AFM procedure).

Cabin must be depressurized for landing.

Takeoff is prohibited with the following forms of contamination:

1. With frost adhering to the following critical areas:
   a. Wing Leading Edge
   b. Upper Wing Surface
   c. Windshield

(Continued Next Page)

TAKEOFF AND LANDING OPERATIONAL LIMITS (Continued)

2. With ice, snow or slush adhering to the following critical areas:
   a. Wing Leading Edge and Upper Wing Surface
   b. Flight Control Surfaces including all hinge gaps
   c. Horizontal Stabilizer
   d. Vertical Stabilizer
   e. Engine Inlets
   f. Top of Engine Pylons
   g. Top of Fuselage
   h. Windshield
   i. All Static Ports
   j. Stall Warning Vane
   k. Upper surface of nose forward of the windshield
3. A visual and tactile (hand on surface) check of the wing leading edge and the wing upper surface must be performed to ensure the wing is free from frost, ice, snow, or slush when the outside air temperature is less than 10°C (50°F) or if it cannot be determined that the wing fuel temperature is above 0°C (32°F) and:
   a. There is visible moisture present (rain, drizzle, sleet, snow, fog, etc.); or
   b. Water is present on the wing upper surface; or
   c. The difference between the dew point and the outside temperature is 3°C (5°F) or less; or
   d. The atmospheric conditions have been conducive to frost formation.

ENROUTE OPERATIONAL LIMITS

GENERAL

Maximum Operating Altitude. . . . . 41,000 Feet
Maximum Ambient Temperature . . . . . Refer to Figure 2-13
Minimum Ambient Temperature . . . . . Refer to Figure 2-13
Maximum Altitude for Extension of Flaps . . . . . 18,000 Feet
Minimum Temperature for Operation of Flaps . . . . . -40°C
Yaw Damper must be engaged above FL300.

TAKEOFF / LANDING / ENROUTE TEMPERATURE LIMITS

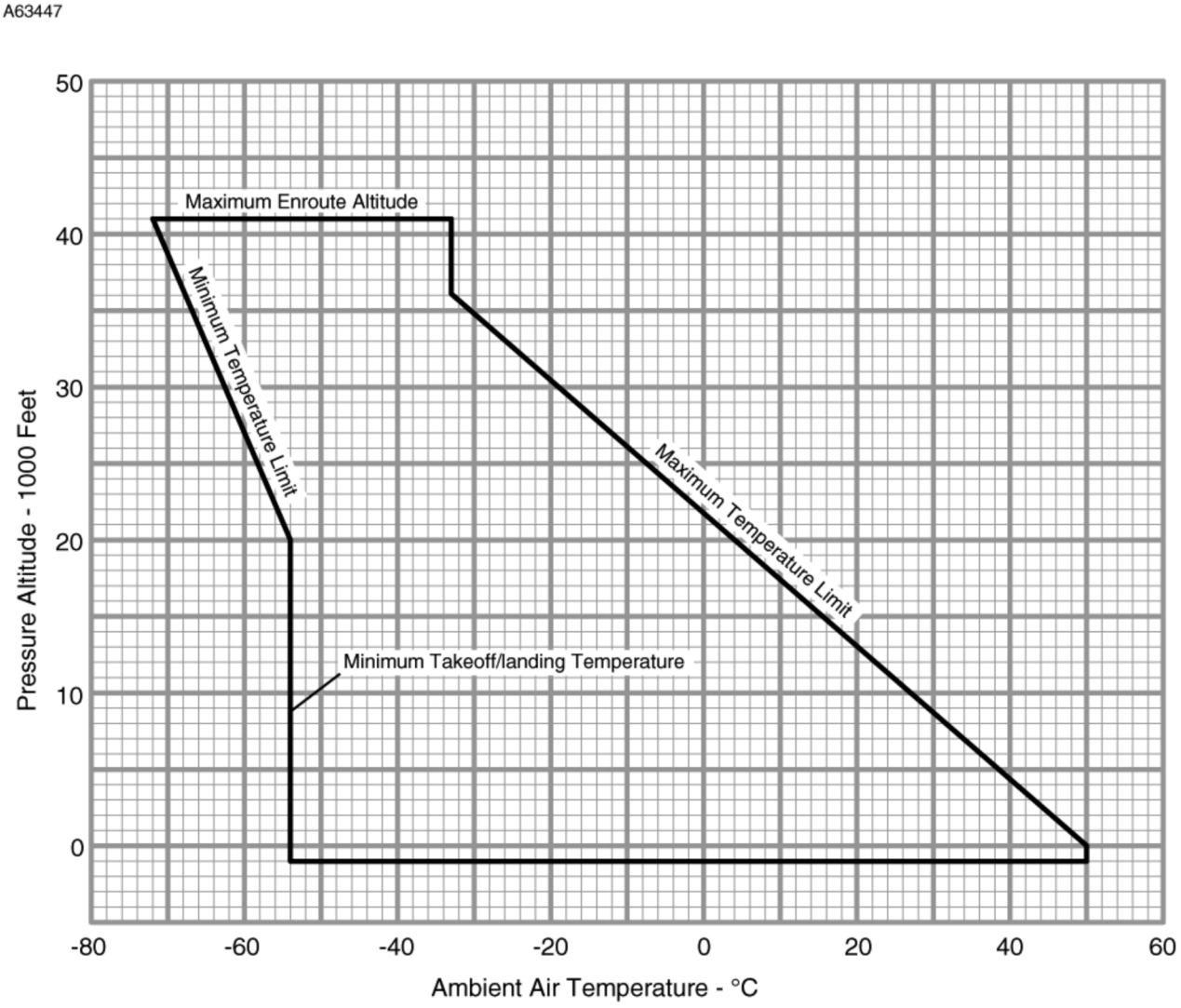

Figure 2-13

NOTE

- Ambient Air Temperature is ISA Temperature corrected for Indicated ISA Deviation (reference Figures 4-2 and 4-3).
- For operations below -10°C (+14°F), refer to Section III, Normal Procedures, COLD WEATHER OPERATIONS.
- Long term operation (>30 minutes) with Avionics ON is limited to a maximum Indicated RAT of 48°C if the air-conditioner is operational or ISA+28°C if the air-conditioner is inoperative or turned OFF.

ENROUTE OPERATIONAL LIMITS (Continued)

RVSM OPERATIONS

Minimum Speed in RVSM Airspace . . . . . 110 KIAS
Minimum Weight in RVSM Airspace . . . . . 6300 Pounds
The following equipment must be installed and operating normally upon entering RVSM airspace:

1. Pilot and copilot primary altimeters.
2. Autopilot.
3. Altitude Alerter.
4. ATCRBS Transponder.

NOTE

- Any changes to the pitot/static, air data computer, autopilot, altitude alerting and/or transponder systems, or other changes that affect operation of these systems must be evaluated for impact on the RVSM approval.
- The standby altimeter is not approved for RVSM operations.

Each operator must ensure compliance with required crew training and operating practices and procedures. Individual airplane and operational approval must be obtained in accordance with applicable operating rules.

MINIMUM CREW

Except where otherwise prescribed by applicable operating limitations,
Minimum Crew for all operations:

1 Pilot, provided:

a. The pilot holds a CE510(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 holds a CE510(S) or CE510 (second-in-command required) pilot type rating.

LOAD FACTOR

Flaps - UP (0º) . . . . . -1.44 to +3.6G at 8,645 lbs.
Flaps - TAKEOFF / APPROACH or LAND (15º or 30º). . . . . .0.0 to +2.0G at 8,645 lbs.

NOTE

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

CABIN PRESSURIZATION LIMITATIONS

Normal Cabin Pressurization Limitations . . . . . 0.0 to 8.5 (+0.1) PSID

MANEUVER LIMITATIONS

Acrobatic maneuvers, including spins, are prohibited.

Intentional stalls are prohibited above 18,000 feet.

Refer to Figure 2-12 for maximum maneuvering speeds.

PASSENGER COMPARTMENT

For taxi, takeoff, and landing, adjustable passenger seats must be positioned with seatbacks upright. Passenger seat belts must be properly fastened.

The maximum passenger seating, not including 2 crew seats, is four.

The use of the lavatory is prohibited for taxi, takeoff, and landing and is limited to one occupant in flight.

BAGGAGE COMPARTMENTS

Nose Baggage Compartment (L-R) . . . . . .320 pounds maximum (combined)

Tailcone Baggage Compartment . . . . . 300 pounds maximum

VORTEX GENERATORS AND STATIC WICKS

The following lists the number of vortex generators required for dispatch:

1. Wing - 16 installed (8 per side), 16 required.

The following lists the number of static wicks that may be missing or broken, but no more than two total:

1. Right-hand wingtip and aileron - 3 installed, 2 required.
2. Left-hand wingtip and aileron - 3 installed, 2 required.
3. Rudder and Tailcone - 4 installed, 3 required.
4. Elevators - 6 installed (3 per side), 5 required.

EICAS AND INSTRUMENT MARKINGS

ENGINE INDICATING SYSTEM

FAN (N_1) RPM INDICATORS

Scale markings	Red Line	100% RPM
Tape Pointer / Digital Readout	Red	>101% RPM
	Red	100 to 101% RPM for ≥ 20 Sec
Tape Pointer	White	≤100% RPM
Digital Readout	Green	≤100% RPM

NOTE

- Tape Pointer and Digital Readout will turn red if outside normal operating limits. Digits will appear in inverse video.
- White Tape Pointer represents Green band.
- Tape Pointer is removed when N_1 is less than 20%. Digital readout will still be displayed.

INTER-TURBINE TEMPERATURE (ITT) INDICATORS

Scale markings	Red Line	> 862°C
	Amber Band	> 830 to 862°C
Tape Pointer / Digital Readout (Engine Start)	Red	> 830 to 862°C for > 5 Sec
	Amber	> 830 to 862°C for ≤ 5 Sec
Tape Pointer / Digital Readout (Engine Running)	Red	> 830 to 862°C for > 20 Sec
	Amber	> 830 to 862°C for ≤ 20 Sec
Tape Pointer	White	≤ 830°C
Digital Readout	Green	< 830°C

NOTE

- The Tape Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.
- White Tape Pointer represents green band.
- Digits will only appear during engine start, limit exceedance, or when below 200°C.

TURBINE (N_2) RPM INDICATORS

Digital Readout	Red	> 102% RPM
	Red	> 100 to 102% RPM for > 20 Sec
	Amber	> 100 to 102% RPM for ≤ 20 Sec
	Green	≤100% RPM
	White	During Engine Start

NOTE

Digital Readout will turn red if outside normal operating limits. Digits will appear in inverse video.

(Continued Next Page)

EICAS AND INSTRUMENT MARKINGS (Continued)

OIL TEMPERATURE INDICATORS

Scale Markings	Red Band	> 141°C
	Amber Band	>135 to 141°C
	Green Band	22 to 135°C
	Amber Band	-40 to 22°C
	Red	-50 to -40°C
Pointer / Digital Readout	Red	> 140°C
	Red	135 to 141°C > 90 Sec
	Amber	135 to 141°C ≤ 90 Sec
	Green (Pointer Only)	22 to 135°C
	Amber	-40 to 22°C
	Red	< -40°C

NOTE

- The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.
- Digital values are not shown when oil temperatures are in the green band.

OIL PRESSURE INDICATORS

Scale Markings	Red Band	> 250 PSI
	Amber Band	170 to 250 PSI
	Green Band	Variable to 170 PSI
	Amber Band	Variable
	Red Band	Variable
Pointer / Digital Readout	Red	> 275 PSI
	Red	170 to 250 PSI for > 500 Sec
	Amber	170 to 250 PSI ≤ 500 Sec
	Green	Variable to 170 PSI
	Amber	Variable
	Red	In Yellow for > 90 Sec
	Red	Below Variable Limit

NOTE

- The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.
- Low oil pressure limits vary with engine N_2. Refer to Figure 2-7. Values may be different for the left and right engines.
- Digital values are not shown when oil pressures are in the green band.

(Continued Next Page)

EICAS AND INSTRUMENT MARKINGS (Continued)

DC VOLTAGE INDICATORS

Pointer / Digital Readout/ Scale Markings	Red	37 to 40 VDC
	Amber	33 to 36 VDC
	Green	22 to 32 VDC
	Amber	11 to 21 VDC
	Red	0 to 10 VDC

NOTE

The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.

DC CURRENT INDICATORS

ENGINE AT GROUND IDLE

Pointer / Digital Readout/ Scale Markings	Red	180 to 995 AMPS
	Amber	150 to 175 AMPS
	Green	-995 to 145 AMPS

NOTE

The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.

ENGINE ABOVE GROUND IDLE OR IN-AIR AT FL300 OR BELOW

Pointer / Digital Readout/ Scale Markings	Red	450 to 995 AMPS
	Amber	300 to 445 AMPS
	Green	-995 to 295 AMPS

NOTE

The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.

IN - AIR ABOVE FL300

Pointer / Digital Readout/ Scale Markings	Red	450 to 995 AMPS
	Amber	280 to 445 AMPS
	Green	-995 to 275 AMPS

NOTE

The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.

(Continued Next Page)

EICAS AND INSTRUMENT MARKINGS (Continued)

BATTERY VOLTAGE INDICATOR

Digital Readout	Red	37 to 40 VDC
	Amber	33 to 36 VDC
	Green	22 to 32 VDC
	Amber	11 to 21 VDC
	Red	0 to 10 VDC

NOTE

The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.

BATTERY CURRENT INDICATOR

Digital Readout	Red	500 to 995 AMPS
	Amber	300 to 495 AMPS
	Green	-995 to 295 AMPS

NOTE

The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.

CABIN PRESSURIZATION INSTRUMENTATION

CABIN ALTITUDE

Pointer / Digital Readout/ Scale Marking (Normal Mode)	Red Band	> 10,000 Feet
	Amber Band	8,500 to 10,000 Feet
	Green Band	< 8,500 Feet
Pointer / Digital Readout/ Scale Marking (High Altitude Mode)	Red Band	> 14,600 Feet
	Amber Band	14,000 to 14,600 Feet
	Green Band	< 14,000 Feet
Pointer / Scale Marking (Ground)	Green Band	Entire Range

NOTE

- The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.
- The Pressurization system will be in high altitude mode if Takeoff or Destination Elevation > 8,000 feet and airplane is below 24,500 feet.
- Cabin Altitude is not displayed when the airplane is on the ground.

(Continued Next Page)

EICAS AND INSTRUMENT MARKINGS (Continued)

CABIN ALTITUDE RATE

Scale Markings	White	Entire Range
Digital Readout	Green	Entire Range

CABIN DIFFERENTIAL PRESSURE

Pointer / Digital Readout/ Scale Markings	Red Band	8.6 TO 10 PSI
	Green Band	≤ 8.5 PSI

NOTE

The Pointer and Digital Readout will turn red or amber if outside normal operating limits. Digits will appear in inverse video.

OTHER INSTRUMENTS

Airspeed Indicator	Red Line	250 KIAS (0.63 Mach)
Hydraulic Reservoir Volume		Per Bottle Markings
Hydraulic Accumulator Pressure Indicator		Per Placard According to Temperature
Emergency Brake Pneumatic Pressure Indicator		Per Placard According to Temperature
Emergency Gear Pneumatic Pressure Indicator		Per Placard According to Temperature
Oxygen Pressure Indicator	Red Line	2000 PSI
	Amber Arc	0 to 400 PSI

SUPPLEMENTAL OXYGEN SYSTEM

Service the oxygen system with Aviator's Breathing Oxygen (MIL-O-27210). The use of medical oxygen 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.

The following aircraft certification requirements are in addition to the requirements of applicable operating rules. The most restrictive requirements (certification or operating) must be observed:

1. Crew and passenger oxygen masks are not approved for use above 40,000 feet cabin altitude. Prolonged use of passenger masks above 25,000 feet cabin altitude is not approved.
2. The pressure demand crew oxygen masks must be properly stowed in their containers to qualify as a quick-donning oxygen mask.

WARNING

- **SOME LARGE EYEGLASSES, HEADSETS, HATS AND HAIRSTYLES MAY INTERFERE WITH THE QUICK DONNING CAPABILITY OF THE MASK. IT IS THE CREW MEMBERS RESPONSIBILITY TO ENSURE THE MASK CAN BE DONNED QUICKLY.**
- **PASSENGER MASKS ARE INTENDED FOR USE DURING AN EMERGENCY DESCENT TO AN ALTITUDE NOT REQUIRING SUPPLEMENTAL OXYGEN.**

STALL WARNING AND LOW SPEED AWARENESS SYSTEMS

The low airspeed awareness system can be used as a reference for approach speed (V_{REF}) at all airplane anti-ice settings, weights, CG locations, and flap positions. V_{REF} is indicated by a green circle on the pilot and copilot airspeed indicators.

The low speed awareness system may be used as a reference, but does not replace the airspeed display in the PFD as a primary instrument.

GARMIN G1000 AVIONICS SYSTEM

1. The Garmin G1000 Cockpit Reference Guide for the Cessna Citation MUSTANG, 190-00600-01, Rev B, dated April 2007, or later applicable revision, must be immediately available to the flight crew.
2. These limitations apply to Garmin system software version 0435.09.
3. Category II approaches are prohibited.
4. Dispatch is prohibited following a flight where either a PFD/MFD COOLING or GIA 1-2 COOLING Garmin System Message was displayed, until the condition is identified and corrected.
5. Dispatch is prohibited with a PFD/MFD SERVICE, GIA 1-2 SERVICE, or GMA 1-2 SERVICE Garmin System Message displayed, until the condition is identified and corrected.
6. All display units must be installed and operational.
7. Dispatch with a display in reversionary mode is prohibited.
8. Autopilot:
   a. One pilot must remain seated, with the seatbelt fastened, during all autopilot operations.
   b. Autopilot operation is prohibited if either PFD is in AHRS reversion.
   c. Autopilot Minimum-Use-Height:
      (1) Takeoff, and Climb ..... 700 feet AGL
      (2) Enroute and Descent ..... 1000 feet AGL
      (3) Approach (GP or GS Mode) ..... 200 feet AGL
      (4) Approach (FLC, VS, PIT or ALT Mode) ..... Higher of 400 feet AGL or Approach MDA
9. Use of VNAV is prohibited during an approach with a teardrop course reversal. VNAV will fail at the beginning of the teardrop.
10. Use of the NAVIGATION MAP page for pilotage navigation is prohibited unless required by AFM procedure. The NAVIGATION MAP is intended only to enhance situational awareness. Navigation is to be conducted using only current charts, data, and authorized navigation facilities.
11. Use of the TRAFFIC MAP to maneuver the airplane to avoid traffic is prohibited. The TRAFFIC INFORMATION SYSTEM (TIS) is intended for advisory use only. TIS is intended only to help the pilot to visually locate traffic. It is the responsibility of the pilot to see and maneuver to avoid traffic.
12. Use of the TERRAIN information for primary terrain avoidance is prohibited. The TERRAIN information is intended only to enhance situational awareness. It is the pilot's responsibility to provide terrain clearance at all times.
13. Use of the WEATHER MAP (XM Weather) for hazardous weather (thunderstorm) penetration is prohibited. LTNG information on the NAVIGATION MAP or WEATHER MAP is approved only as an aid to hazardous weather avoidance, not penetration.
14. The fuel quantity, fuel required, fuel remaining, and gross weight estimate functions of the G1000 are supplemental information only and must be verified by the flight crew.

GARMIN G1000 GPS NAVIGATION SYSTEM

OPERATIONAL APPROVALS

The Garmin G1000 GPS receivers are approved under TSO C145a Class 3. The Garmin G1000 system has been demonstrated capable of, and has been shown to meet the accuracy requirements for, the following operations provided it is receiving usable navigation data. These do not constitute operational approvals.

1. Enroute, terminal, non-precision instrument approach operations using GPS and WAAS (including "GPS", "or GPS", and "RNAV" approaches), and approach procedures with vertical guidance (including "LNAV/VNAV", "LNAV + V", and "LPV") within the U.S. National Airspace System in accordance with AC 20-138A.
2. As a required Long Range Navigation (LRN) system for use in the following types of airspace when used in conjunction with Garmin WAAS Fault Detection/Exclusion Prediction Program, part number 006-A0154-01 or later approved version:
   a. Oceanic/Remote - RNP-10 (per FAA AC 20-138A, FAA Notice 8110-60, FAA Order 8400-12A, and FAA Order 8700-1). Both GPS receivers are required to be operating and receiving usable signals except for routes requiring only one Long Range Navigation (LRN) sensor.

NOTE

Each display computes an independent navigation solution based on the on-side GPS sensor. However, either display will automatically revert to the cross-side sensor if the on-side sensor fails or if the cross-side sensor is determined to be more accurate. A “BOTH ON GPS1” or “BOTH ON GPS2” message does not necessarily mean that one GPS has failed. Refer to the MFD AUX-GPS STATUS page to determine the state of the unused GPS.

   b. North Atlantic (NAT) Minimum Navigational Performance Specifications (MNPS) Airspace per AC 91-49 and AC 120-33. Both GPS receivers are required to be operating and receiving usable signals except for routes requiring only one Long Range Navigation sensor.
   c. Enroute and Terminal including RNP5/BRNAV and PRNAV (RNP-1) - In accordance with JAA TGL-10, ACJ 20X4, and AC 90-96A, provided the FMS is receiving usable navigation information from one or more GPS receivers.

LIMITATIONS

1. GPS based IFR enroute, oceanic, and terminal navigation is prohibited unless the pilot verifies the currency of the database or verifies each selected waypoint for accuracy by reference to current approved data.
2. RNAV/GPS instrument approaches must be accomplished in accordance with approved instrument approach procedures that are retrieved from the G1000 navigation database. The G1000 database must incorporate the current update cycle.

NOTE

Not all published approaches are in the navigation database. The flight crew must ensure that the planned approach is in the database.

(Continued Next Page)

GARMIN G1000 GPS NAVIGATION SYSTEM (Continued)

a. Receiver Autonomous Integrity Monitoring (RAIM) must be available when conducting instrument approaches utilizing the GPS receiver.

b. IFR non-precision approach approval is limited to published approaches within the U.S. National Airspace System. Approaches to airports in other airspace are not approved unless authorized by the appropriate governing authority.

c. Use of the Garmin G1000 GPS receiver to accomplish ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for GPS overlay is not authorized.

3. Operation in airspace referenced to a datum other than WGS-84 or NAD-83 is prohibited.

4. RNP operations are not authorized except as noted in the Operational Approvals section.

5. Use of the Garmin G1000 system for GPS or WAAS navigation under Instrument Flight Rules (IFR) requires that:

a. The airplane must be equipped with an approved and operational alternate means of navigation appropriate to the route being flown (NAV receiver, DME or ADF).

b. For flight planning purposes, if an alternate airport is required, it must have an approved instrument approach procedure, other then GPS or RNAV, that is anticipated to be operational and available at the estimated time of arrival. All equipment required for this procedure must be installed and operational.

c. For procedures requiring a prediction of GPS integrity monitoring (RAIM) capability for TSO-C129a (non-WAAS) equipment (e.g. oceanic operations, U.S. RNAV routes, European BRNAV and PRNAV, etc.), the Garmin WAAS Fault Detection/Exclusion Prediction program (006-A0154-01 or later approved version) should be used to confirm the availability of RAIM for the intended route and time of flight. Generic prediction tools do not provide an accurate indication of RAIM availability for the Garmin G1000 system.

d. When flight planning an LNAV/VNAV or LPV approach, the Garmin WAAS Fault Detection/Exclusion Prediction program (006-A0154-01 or later approved version) should be used in addition to any NOTAMs issued from the approach.

STANDBY INSTRUMENTS

The standby flight instruments (including ATT, ALT and ASI) must successfully complete the preflight test defined in the Normal Procedures section and be functioning prior to takeoff.

AHRS AREAS OF OPERATION

Navigation using the G1000 is not authorized north of 70° North latitude or south of 70° South Latitude due to unsuitability of the magnetic fields near the Earth's poles. In addition, operations are not authorized in the following two regions:

1. North of 65° North latitude between longitude 75° W and 120° W (Northern Canada).
2. South of 55° South latitude between longitude 120° E and 165° E (region south of Australia and New Zealand).

Dispatch is prohibited with the GEO LIMITS Garmin System message displayed.

ICE AND RAIN PROTECTION

In icing conditions, the airplane must be operated, and its ice protection systems must be used, as described in Section III, Normal Procedures, ICE PROTECTION SYSTEMS. Specific operational speeds and performance information must be used where established for such conditions.

The ENGINE Anti-Ice switches must be selected ON at a RAT of +10°C (50°F) or colder when in visible moisture.

WING/STAB DEICE must be selected to AUTO at the first sign of ice accretion anywhere on the airplane.

Except for the ground preflight check, maximum RAT for operation of engine anti-ice with the throttles above idle is +20°C (+68°F).

Limit the ground operation of the pitot-static heat to two minutes to preclude damage to the pitot tubes and stall warning vane.

The airplane must be free of ice prior to takeoff. Anti-ice systems must not be used to deice engine inlets prior to takeoff. Dispatch with polished frost is prohibited.

CAUTION

TO PREVENT POSSIBLE ENGINE DAMAGE FROM INGESTION OF ICE, DO NOT CHIP OR SCRAPE ICE OR SNOW FROM THE ENGINE AIR INLET. DEICE THESE AREAS PRIOR TO START.

Minimum airspeed for sustained flight in icing conditions (except approach and landing) is 160 KIAS.

In icing conditions, operation at other than flaps UP and landing gear retracted is prohibited except during approach and landing.

The use of wing or tail de-ice boots is prohibited below -30°C RAT.

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 BE SHED WHEN USING THE ICE PROTECTION SYSTEMS, AND MAY SERIOUSLY DEGRADE THE PERFORMANCE AND CONTROLLABILITY OF THE AIRPLANE.

(Continued Next Page)

OPERATIONS IN SEVERE ICING CONDITIONS (Continued)

During flight, severe icing conditions 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 edge of the boot.

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, can 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 basic 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 14 CFR 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.

System and/or Component	KIND OF OPERATION					COMMENTS
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
AUTO FLIGHT						
1 - Autopilot (1)	0*	0*	0*	0*	0*	* Required for single pilot operation and in RVSM airspace.
2 - Yaw Damper (1)	0*	0*	0*	0*	0*	* Required above FL300. Autopilot will be inoperative with inoperative yaw damper.
3 - Electric Elevator Trim (1)	0	0	0	0	0	Manual elevator trim must be operational.
4 - Yoke Autopilot Disconnect Switches (2)	1*	1*	1*	1*	1*	* Left side is required for single pilot operations. Both sides required for two crew operation.
** These items are part of the Engine Indicating and Crew Alerting System (EICAS) displayed on the MFD.						

(Continued Next Page)

KINDS OF OPERATIONS EQUIPMENT LIST (Continued)

System and/or Component	KIND OF OPERATION					COMMENTS
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
AIR CONDITIONING / PRESSURIZATION						
1 - Flow Control Valves (2)	2	2	2	2	2	
2 - Pressure Regulating Shutoff Valves (2)	2	2	2	2	2	
3 - Cabin Outflow Valves (2)	2	2	2	2	2	
4 - Cabin Differential Pressure Gauge ** (1)	1	1	1	1	1	
5 - Cabin Altitude Warning System (1)	1	1	1	1	1	
6 - Cabin Altitude Display ** (1)	1	1	1	1	1	
7 - Cabin Differential Pressure Display ** (1)	1	1	1	1	1	
8 - Cockpit Temperature Control System (except Air Conditioner) (1)	1	1	1	1	1	
9 - Cabin Temperature Control System (except Air Conditioner (1)	1	1	1	1	1	
10 - Air conditioning System (1)	0*	0*	0*	0*	0*	*Temperature limits reduced with inoperative air conditioner. Refer to Figure 2-13.
11 - Pressurization Control System (1)	1	1	1	1	1	
12 - Cockpit Fan (1)	1	1	1	1	1	
13 - Cabin Fan (1)	1	1	1	1	1	
14 - Fresh Air Fan (1)	1	1	1	1	1	
15 - Glareshield Avionics Fans (3)	3	3	3	3	3	
16 - Emergency Pressurization Dump System (1)	1	1	1	1	1	
** These items are part of the Engine Indicating and Crew Alerting System (EICAS) displayed on the MFD.						

(Continued Next Page)

KINDS OF OPERATIONS EQUIPMENT LIST (Continued)

System and/or Component	KIND OF OPERATION					COMMENTS
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
COMMUNICATIONS						
1 - Communication Systems (VHF) (2)	*	*	1*	1*	1*	* Or as required by operating regulation
2 - Audio Control Panels (Pilot and Copilot) (2)	1*	1*	1*	1*	1*	* Left side is required for single pilot operations. Both sides required for two crew operation.
3 - Static Wicks (16)	14*	14*	14*	14*	14*	* One may be missing from any control surface. No more than 2 total may be missing.
4 - Hand Microphone (1)	1	1	1	1	1	
ELECTRICAL POWER						
1 - DC Generator (2)	2	2	2	2	2	
2 - DC Generator VOLTS Display ** (2)	2	2	2	2	2	
3 - DC Generator AMPS Display ** (AMPS) (2)	2	2	2	2	2	
4 - Main Battery (1)	1	1	1	1	1	
5 - Battery VOLTS Display ** (1)	1	1	1	1	1	
6 - Battery AMPS Display ** (1)	1	1	1	1	1	
7 - Battery Temperature Monitoring System (1)	1*	1*	1*	1*	1*	* Required only with NiCad battery option.
8 - Standby Instrument Battery (1)	1	1	1	1	1	
EQUIPMENT / FURNISHINGS						
1 - Passenger Seat Belts (4)	*	*	*	*	*	* One per occupied seat
2 - Crewmember Seat Belts (2)	1*	1*	1*	1*	1*	* Left side required. Right side may be inoperative if seat is not occupied.
3 - Aircraft Emergency Locator Transmitter (ELT) (1)	*	*	*	*	*	

** These items are part of the Engine Indicating and Crew Alerting System (EICAS) displayed on the MFD.

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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	
FIRE PROTECTION						
1 - Engine Fire Detection System (2)	2	2	2	2	2	
2 - Engine Fire Extinguishing System (1)	1	1	1	1	1	
3 - Portable Fire Extinguisher (1)	1	1	1	1	1	
FLIGHT CONTROLS						
1 - Flap System (1)	1	1	1	1	1	
2 - Flap Position Indicator ** (1)	1	1	1	1	1	
3 - Trim Systems - Elevator, Aileron, Rudder (3)	3	3	3	3	3	
4 - Trim Position Indicator Systems - Elevator, Aileron **, Rudder **	3	3	3	3	3	
5 - Speed Brake System (1)	1	1	1	1	1	Includes L and R sides.
ICE AND RAIN PROTECTION						
1 - Engine Anti-Ice Systems (2)	2	2	2	2	2	
2 - Engine T2 Heaters (2)	2	2	2	2	2	
3 - Tail De-Ice Boot System (3)	0	0	0	0	3	Includes L and R horizontal tail and vertical tail boots.
4 - Wing De-Ice Boot System (2)	2	2	2	2	2	Includes L and R wing boots.
5 - Windshield Anti-Ice Systems (2)	1*	1*	1*	1*	2	*Left side required for ground defog and rain removal.
6 - Pitot Probe Heaters (2)	2	2	2	2	2	
7 - Static Port Heaters (4)	4	4	4	4	4	
8 - Stall Warning Heater (1)	1	1	1	1	1	
** These items are part of the Engine Indicating and Crew Alerting System (EICAS) displayed on the MFD.						

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KINDS OF OPERATIONS EQUIPMENT LIST (Continued)

System and/or Component	KIND OF OPERATION: VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	COMMENTS
INDICATING / RECORDING SYSTEMS						
1 - MASTER WARNING Switch/ Lights (2)	1*	1*	1*	1*	1*	*Left side is required for single-pilot operations. Both sides required for two-crew operation.
2 - MASTER CAUTION Switch/ Lights (2)	1*	1*	1*	1*	1*	*Left side is required for single-pilot operations. Both sides required for two-crew operation.
3 - Stall Warning System (1)	1	1	1	1	1	
4 - Aural Warning Systems	*	*	*	*	*	All Audio warnings must be operational.
LANDING GEAR / BRAKES						
1 - Landing Gear Position Indicators (3)	3	3	3	3	3	
2 - Landing Gear UNSAFE Indicator (1)	1	1	1	1	1	
3 - Landing Gear Warning System (1)	1	1	1	1	1	
4 - Emergency Landing Gear Extension System (1)	1	1	1	1	1	
5 - Power Brake System (1)	1	1	1	1	1	
6 - Antiskid System (1)	0*	0*	0*	0*	0*	* For inoperative antiskid, refer to Abnormal Procedures, DISPATCH WITH ANTISKID INOPERATIVE
7 - Emergency Brake System (1)	1	1	1	1	1	
8 - Hydraulic Power System*	1	1	1	1	1	* Includes pump, accumulator, and indications

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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	
LIGHTS						
1 - Anti-Collision Light System (Wing Strobes) (2)	0	2	0	2	0	
2 - Flashing Beacon Light (1)	0*	0	0*	0	0	* May be inoperative only if Anti-Collision Light System is operational.
3 - Position Light System (2)	0	2*	0	2*	0	* All red, green, & white segments as appropriate must be operational.
4 - Landing/Recognition Lights (2)	0	2	0	2	0	
5 - Fasten Seat Belt Sign (1)	1*	1*	1*	1*	1*	* May be inoperative only if no passengers carried in cabin.
6 - Cabin Emergency Lights (2)	0	2	0	2	0	One light each by cabin door and escape hatch.
7 - Cockpit and Instrument Lighting Sytems (1)	0	1	0	1	0	
8 - Windshield Ice Detection Lights (2)	0	0	0	2*	2	* Required for night ice detection
9 - Wing Ice Detection Light (1)	0	0	0	1*	1	* Required for night ice detection
NAVIGATION						
1 - Primary Flight Display (PFD) (2)	2	2	2	2	2	
2 - Multi-Function display (MFD) (1)	1	1	1	1	1	
3 - Air Data Computers (ADC) (2)	2	2	2	2	2	
4 - Attitude/Heading Reference System (AHRS) (2)	2	2	2	2	2	
5 - Standby Airspeed Indicator (1)	1	1	1	1	1	
6 - Standby Attitude Indicator (1)	1	1	1	1	1	

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KINDS OF OPERATIONS EQUIPMENT LIST (Continued)

System and/or Component	KIND OF OPERATION: VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	COMMENTS
NAVIGATION (Continued)						
7 - Standby Altimeter (1)	1	1	1	1	1	
8 - Magnetic Compass (1)	1	1	1	1	1	
9 - ATC Transponder (2)	0*	0*	1*	1*	1*	* Or as required by operating regulation
10 - VHF Nav Receiver (2)	0	0	1*	1*	1*	* Or as required by operating regulation
11 - GPS Receivers (2)	0	0	1*	1*	1*	* Or as required by operating regulation
12 - Automatic Direction Finder (ADF) (Optional)	0*	0*	0*	0*	0*	* Or as required by operating regulation
13 - Distance Measuring Equipment (DME) (1)	0*	0*	0*	0*	0*	* Or as required by operating regulation
14 - Marker Beacon Receiver (2)	0*	0*	0*	0*	0*	* Or as required by operating regulation
15 - TAWS (1)	0*	0*	0*	0*	0*	* Or as required by operating regulation
16 - Weather Radar (1)	0	0	0	0	0	
17 - XM Datalink Weather (1)	0	0	0	0	0	
OXYGEN						
1 - Oxygen System including Pressure Gauge (1)	1	1	1	1	1	Required if unpressurized or for flight above FL240.
2 - Passenger Oxygen System (4)	*	*	*	*	*	* If any passenger seat is occupied, the number of installed masks must equal the number of passenger seats plus one.
3 - Crew Oxygen Masks (2)	1*	1*	1*	1*	1*	* Left side required. Right side required only if seat is occupied.
DOORS						
1 - Cabin Door Seal (1)	1	1	1	1	1	

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KINDS OF OPERATIONS EQUIPMENT LIST (Continued)

ENGINE FUEL AND CONTROL						
1 - Fuel Boost Pumps (2)	2	2	2	2	2	
2 - Fuel Quantity Indications** (2)	2	2	2	2	2	
3 - Fuel Flow Indications ** (2)	2	2	2	2	2	
4 - Fuel Temperature System ** (1)	1	1	1	1	1	
5 - Fuel Transfer System (1)	1	1	1	1	1	
6 - Firewall Shutoff System (2)	2	2	2	2	2	
7 - Engine Driven Fuel Pump (2)	2	2	2	2	2	
8 - Engine FADEC * (2)	2	2	2	2	2	* Both channels of each FADEC must be operational.
9 - Dual Igniter System and Indications ** (2)	2	2	2	2	2	One dual ignitor system per engine.
10 - Engine Indications (N1, ITT, N2, Oil Pressure, and Oil Temperature) **	2	2	2	2	2	
11 - Engine Synchronizer System (1)	0	0	0	0	0	
MISCELLANEOUS EQUIPMENT						
1 - FAA Approved Airplane Flight Manual	1	1	1	1	1	Accessible to pilot in flight
2 - Garmin G1000 Cockpit Reference Guide	1	1	1	1	1	Accessible to pilot in flight
3 - Passenger Briefing Cards	*	*	*	*	*	* One for each occupied passenger seat

SINGLE PILOT

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

1 - Operable GFC-700 Autopilot.

2 - Headset with microphone (must be worn).

3 - FAA Approved Pilots' Abbreviated Normal Procedures Checklist, Cessna PN 510CLNP-03 or later approved revision.

4 - FAA Approved Pilots' Abbreviated Emergency and Abnormal Procedures Checklist, Cessna PN 510CLEAP-03 or later approved revision.

5 - Provisions for storage and retention of navigation charts, accessible to the pilot from the pilot station.

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