



**LIMITATIONS  
Table of Contents**

02-00-1

Sep 09/02

**CHAPTER 2 - LIMITATIONS**

	Page
<b>TABLE OF CONTENTS</b>	02-00-1
<b>INTRODUCTION</b>	
General	02-01-1
Kinds of Airplane Operation	02-01-2
<b>STRUCTURAL WEIGHT</b>	
Structural Weight Limitation	02-02-1
<b>CENTRE OF GRAVITY</b>	
Centre of Gravity (Limits)	02-03-1
<b>OPERATING LIMITATIONS</b>	
Altitude and Temperature Operating Limits	02-04-1
Operation in Icing Conditions	02-04-2
Cowl Anti-ice System	02-04-2
Wing Anti-ice System	02-04-3
Super-Cooled Large Droplet Icing	02-04-3
Cold Weather Operations	02-04-4
Runway Slopes	02-04-4
Tailwind Conditions	02-04-4
Minimum Flight Crew	02-04-4
Cargo	02-04-4

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**Airplane Flight Manual  
CSP C-012**



**LIMITATIONS  
Table of Contents**

02-00-2

REV 2, Feb 24/04

	Page
<b>POWER PLANT</b>	
Engines	02-05-1
Engine Indications	02-05-1
Thrust Management Data	02-05-1
Engine Warm-up	02-05-1
Engine High Power Schedule Switch <JAA>	02-05-1
Engine Operating Limits	02-05-2
Engine Operating Limits Table	02-05-2
Airplane Cold Soak	02-05-3
Continuous Engine Ignition	02-05-3
Starter Cranking Limits	02-05-3
Engine Start (Ground)	02-05-3
Engine Start or Motoring (Flight)	02-05-3
Motoring (Ground)	02-05-3
Engine Relight	02-05-4
Fuel	02-05-5
Fuel Temperature	02-05-5
Fuel Grades	02-05-6
Fuel Additives	02-05-6
Fuel Crossflow	02-05-6
Oil Grades	02-05-7
Oil Consumption	02-05-7
Engine Oil Level	02-05-7
Oil Replenishment System	02-05-7
Auxiliary Power Unit	02-05-8
Type	02-05-8
Maximum RPM	02-05-8
Starting	02-05-8
Operating Range	02-05-8
APU Bleed Air	02-05-9
APU Generator	02-05-9
APU Indications	02-05-9
<b>I</b>	
Engine Operating Procedure Limits Due to Wind	02-05-12

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**Airplane Flight Manual  
CSP C-012**



**LIMITATIONS  
Table of Contents**

02-00-3

REV 3, May 03/05

	Page
<b>OPERATING SPEEDS</b>	
Maximum Operating Speed and Mach Number	02-06-1
RVSM Maximum Cruise Mach Number <1030>	02-06-1
Design Maneuvering Speed	02-06-1
Flaps Extended Speed	02-06-1
Maximum Landing Gear Operating Speed	02-06-1
Maximum Landing Gear Extended Speed	02-06-1
Tire Limit Speed	02-06-4
Maximum Airspeed for ADG Operation	02-06-4
Turbulence Penetration Speed	02-06-4
Minimum Operating Limit Speed	02-06-4
Windshield Wiper Operation	02-06-4
<b>MANEUVERING LOADS</b>	
Maneuvering Limit Load Factors	02-07-1
Side Slip Maneuvers	02-07-1
<b>SYSTEMS LIMITATIONS</b>	
Air-Conditioning and Pressurization	02-08-1
Automatic Flight Control System	02-08-1
Electrical Systems	02-08-1
Permissible Loads on AC System	02-08-1
Permissible Loads on DC Systems	02-08-2
Circuit Breaker Reset	02-08-2
Flight Controls - Lift/Drag Devices	02-08-2
Slats / Flaps	02-08-2
Flight Spoilers	02-08-2
Stall Protection System	02-08-2
Thrust Reversers	02-08-2
Nose Wheel Steering System	02-08-3
Taxi Lights	02-08-3
Wheel Brake Cooling Limitations	02-08-3
Minimum Descent Altitude	02-08-3
Traffic Alert and Collision Avoidance System (TCAS)	02-08-3
Integrated Standby Instrument (ISI)	02-08-3
Flight Operations	02-08-3
Configuration Deviation List	02-08-3



**LIMITATIONS  
Table of Contents**

02-00-4

REV 2, Feb 24/04

	Page
<b>SYSTEMS LIMITATIONS</b>	
Enhanced Ground Proximity Warning System (EGPWS)	02-08-4
General <2040>	02-08-4
System Limitations <2040>	02-08-4
Terrain Avoidance Maneuvering <2040>	02-08-4
Both GPS Inoperative <1027 & 2040>	02-08-4
Pneumatic System	02-08-5
Multi-Function Displays	02-08-5

<b>NAVIGATION SYSTEMS LIMITATIONS</b>	
Flight Management System <1214>	02-09-1
Global Positioning System <1027>	02-09-2

**LIST OF ILLUSTRATIONS**

<b>CENTRE OF GRAVITY</b>	
Figure 02-03-1      Centre of Gravity Limits	02-03-1

<b>OPERATING LIMITATIONS</b>	
Figure 02-04-1      Altitude and Temperature Operating Limits	02-04-1

<b>POWER PLANT</b>	
Figure 02-05-1      Engine Start Envelope	02-05-4
Figure 02-05-2      APU Start and Operating Limits	02-05-10
Figure 02-05-3      APU Altitude and Airspeed Chart	02-05-11
Figure 02-05-4      Engine Operating Limits Due to Wind	02-05-12

<b>OPERATING SPEEDS</b>	
Figure 02-06-1      Maximum Operating Speed and Mach Number	02-06-2
Figure 02-06-2      Design Maneuvering Speeds	02-06-3



**LIMITATIONS  
Introduction**

02-01-1

Sep 09/02

**1. GENERAL**

The limitations included in this chapter contain items peculiar to the CL600, model 2D24 Regional Jet airplane. Observance of these limitations is mandatory.

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CSP C-012**



LIMITATIONS  
Introduction

02-01-2

REV 2, Feb 24/04

2. KINDS OF AIRPLANE OPERATION

The airplane is certified in the transport category for day and night operations, in the following conditions when the equipment and instruments required by the airworthiness and operating regulations are approved, installed and in an operable condition:

- VFR and IFR
- Flight in icing conditions

The airplane is certified for ditching when the safety equipment specified by the applicable regulations is installed.

*Effectivity: <1030>*

- Airplanes **equipped** for operation in Reduced Vertical Separation Minimum (RVSM) airspace:

The airplane is certified capable of RVSM operations in accordance with the FAA "Interim guidance material on the approval of operations/aircraft for RVSM operations.", 91-RVSM, dated June 30, 1999 and with the JAA Temporary Guidance Leaflet, TGL No. 6, revision 1, RVSM.

**NOTE**

Compliance with the standard noted above does not constitute an operational approval.

RVSM operations must not be commenced or continued unless all of the required equipment specified below is operational.

RVSM REQUIRED EQUIPMENT LIST	
EQUIPMENT	REQUIREMENTS FOR RVSM
AUTOPILOT (1)	MUST BE OPERATIONAL.
ALTITUDE ALERTING SYSTEM	MUST BE OPERATIONAL.
ALTITUDE REPORTING TRANSPONDER (2)	ONE (1) MUST BE OPERATIONAL.
AIR DATA COMPUTERS (2)	TWO (2) MUST BE OPERATIONAL.

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CSP C-012



**LIMITATIONS  
Structural Weight**

02-02-1

REV 3, May 03/05

**1. STRUCTURAL WEIGHT LIMITATION**

<b>Weight</b>	<b>kg</b>	<b>lb</b>	<b>Option Code</b>
Maximum taxi and ramp weight	36,613	80,719	<2217>
Maximum take-off weight (MTOW)	36,500	80,469	<2217>
Maximum landing weight (MLW)	33,339	73,500	
Maximum zero fuel weight (MZFW)	31,751	70,000	
Minimum flight weight	20,412	45,000	

**NOTE**

The maximum take-off weight (MTOW) and/or maximum landing weight (MLW) may be further limited due to performance considerations.



**LIMITATIONS**  
**Structural Weight**

02-02-2

Sep 09/02

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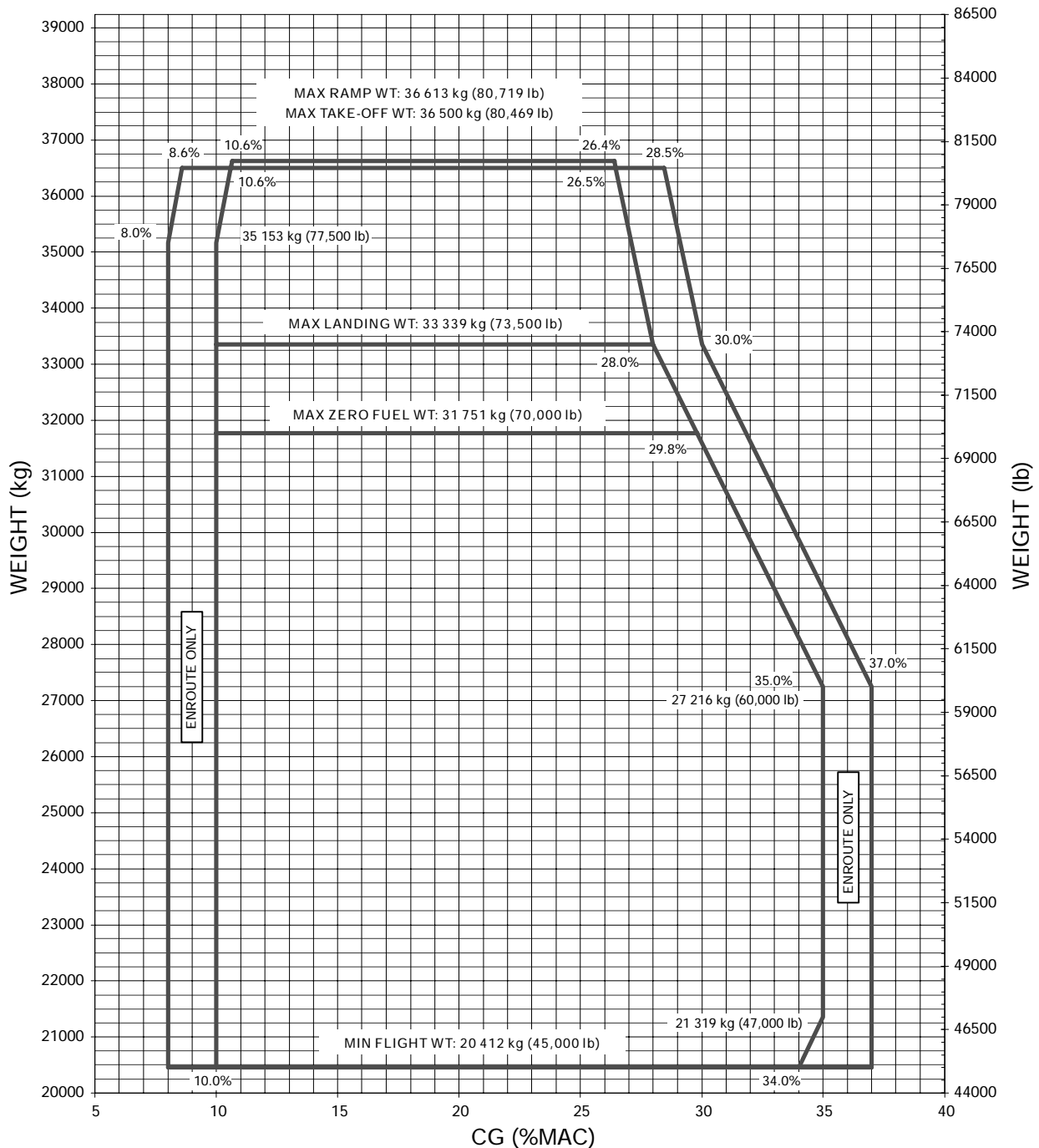
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**CSP C-012**



### 1. CENTRE OF GRAVITY (LIMITS)

The maximum permissible centre of gravity (CG) range with landing gear extended is shown below. The airplane must be loaded in accordance with the loading instructions associated with the Weight and Balance Manual (CSP C-041). The effect of landing gear retraction on CG position is negligible.



Centre of Gravity Limits  
Figure 02-03-1



**LIMITATIONS**  
**Centre of Gravity**

02-03-2

Sep 09/02

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**CSP C-012**

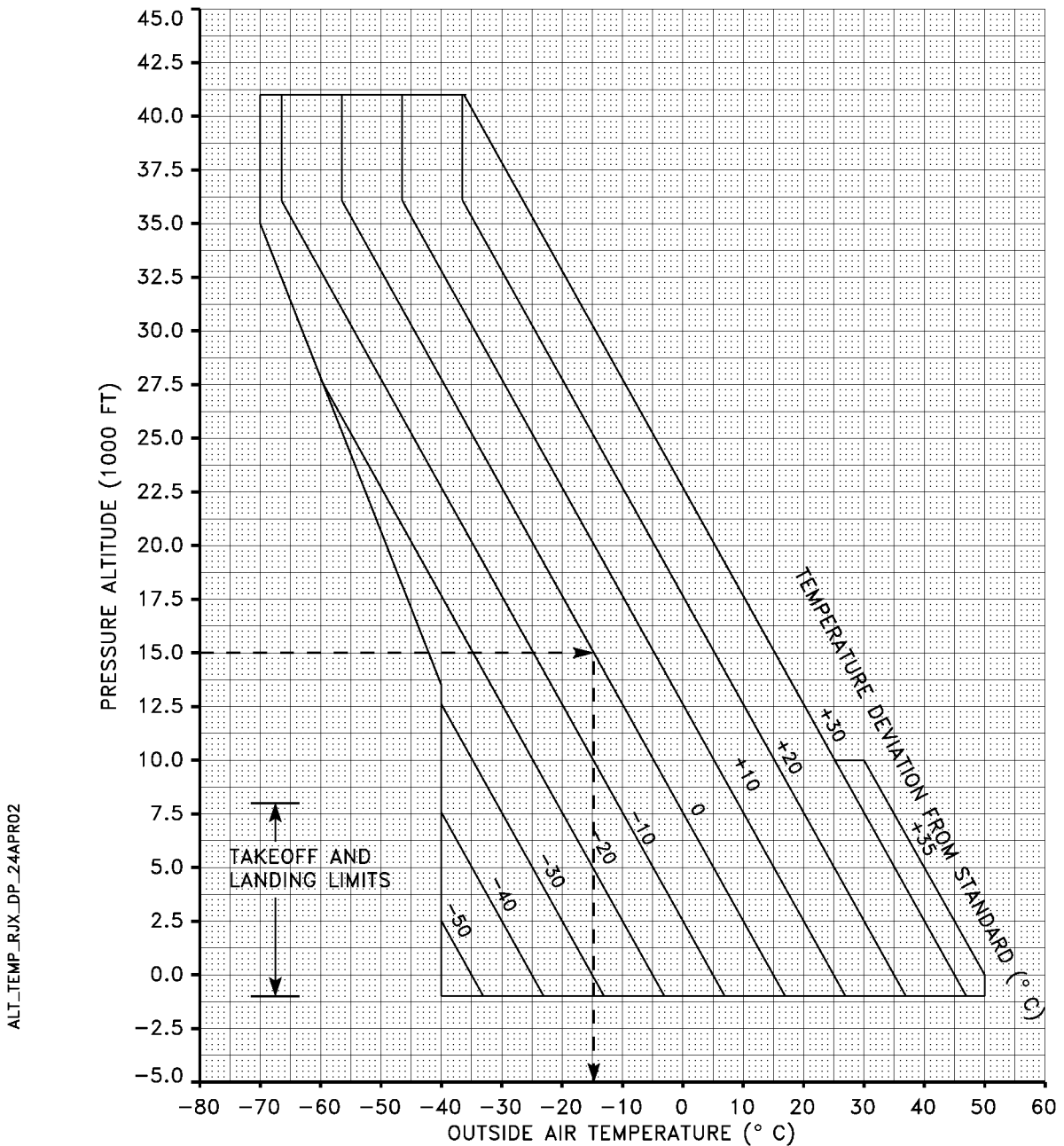
**1. ALTITUDE AND TEMPERATURE OPERATING LIMITS**

Maximum airport pressure altitude for take-off and landing is 8,000 feet.

Maximum operating altitude is 41,000 feet.

Maximum ambient air temperature approved for take-off and landing is ISA + 35°C.

Minimum ambient temperature approved for take-off is -40°C (-40°F).



Altitude and Temperature Operating Limits  
Figure 02-04-1



**LIMITATIONS**  
**Operating Limitations**

02-04-2

REV 2, Feb 24/04

I

**2. OPERATION IN ICING CONDITIONS**

**A. Cowl Anti-ice System**

**Ground Operations**

- The cowl anti-ice system must be ON when the OAT is 10°C (50°F) or below and visible moisture in any form is present (such as fog with visibility of 1,500 meters (one mile) or less, rain, snow, sleet and ice crystals).
- The cowl anti-ice system must also be ON when the OAT is 10°C (50°F) or below when operating on runways, ramps, or taxiways where surface snow, ice, standing water, or slush is present.

**Flight Operations**

**NOTE**

Icing conditions exist in flight at a **TAT** of 10°C (50°F) or below, and visible moisture in any form is encountered (such as clouds, rain, snow, sleet or ice crystals), except when the **SAT** is -40°C (-40°F) or below.

- The cowl anti-ice system must be ON:
  - When in icing conditions, or
  - when ICE is annunciated by the ice detection system.

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**Airplane Flight Manual**  
**CSP C-012**



**LIMITATIONS**  
**Operating Limitations**

02-04-3

REV 3, May 03/05

**2. OPERATION IN ICING CONDITIONS (CONT'D)**

**B. Wing Anti-ice System**

**Ground Operations**

- The wing anti-ice system must be ON for take-off when the OAT is 5°C (41°F) or below and visible moisture in any form is present (such as fog with visibility of 1,500 meters (one mile) or less, rain, snow, sleet and ice crystals).
- The wing anti-ice system must also be ON for take-off when the OAT is 5°C (41°F) or below and the runway is contaminated with surface snow, slush or standing water.
- When Type II, III or Type IV anti-icing fluids have been applied, the wing anti-ice system must only be selected ON, if required, just prior to thrust increase for take-off.

**Flight Operations**

**NOTE**

Icing conditions exist in flight at a **TAT** of 10°C (50°F) or below, and visible moisture in any form is encountered (such as clouds, rain, snow, sleet or ice crystals), except when the **SAT** is -40°C (-40°F) or below.

- The wing anti-ice system must be ON:
  - When ICE is annunciated by the ice detection system, or
  - when in icing conditions and the airspeed is less than 230 KIAS.
- Do not hold in icing conditions with the flaps / slats extended.

**C. Super-Cooled Large Droplet Icing**

- Continued operation in areas where super-cooled large droplet (SLD) icing conditions exist is prohibited.
- SLD icing conditions are indicated by ice accretion on the flight compartment side windows.
  - The wing anti-icing system must be ON in SLD icing conditions.
  - The cowl anti-icing system must be ON in SLD icing conditions.
  - Leave icing conditions when side window icing occurs.



**LIMITATIONS**  
**Operating Limitations**

02-04-4

Sep 09/02

**3. COLD WEATHER OPERATIONS**

Airplane operations in cold weather conditions must be conducted in accordance with Flight Crew Operating Manual Volume 2, Chapter 7, SUPPLEMENTARY PROCEDURES – Cold Weather Operations.

**4. RUNWAY SLOPES**

The maximum runway slopes approved for take-off and landing are:

- +2% (uphill)
- 2% (downhill)

**5. TAILWIND CONDITIONS**

The maximum tailwind component approved for take-off and landing is 10 knots.

**6. MINIMUM FLIGHT CREW**

The minimum flight crew is one pilot and one copilot.

**7. CARGO**

Flight must be within 60 minutes of a suitable airport, if cargo is carried in either cargo compartment.



**LIMITATIONS  
Power Plant**

02-05-1

Sep 09/02

**1. ENGINES**

Type: General Electric CF34-8C5, quantity two.

**A. Engine Indications**

The engine limit display markings on EICAS must be used to determine compliance with the maximum/minimum limits and precautionary ranges. If EICAS markings show more conservative Limits than those specified below, the limit markings on the EICAS must be used.

**NOTE**

- Red - Maximum and minimum Limitations
- Amber - Caution range
- Green - Normal operating range.

CF 34-8C5			
INDICATION	RED	AMBER	GREEN
N <sub>1</sub> % RPM	99.5	-	0 to 99.4
N <sub>2</sub> % RPM	99.4	-	0 to 99.3
ITT °C	Variable	-	Variable
OIL TEMP °C	164	156 to 163	- 40 to 155
OIL PRESS psi	0 to 24	Variable	Variable

**B. Thrust Management Data**

At take-off when the thrust levers are set to TOGA, the crew must verify the target N<sub>1</sub> values displayed correspond to the data presented on the thrust setting charts ( $\pm 0.5\%$ ). Refer to PERFORMANCE - THRUST SETTINGS.

**C. Engine Warm-up**

The engine must remain at IDLE until oil pressure reaches normal operating range

During all starts, do not exceed 75% N<sub>1</sub> for two minutes after start, or until all operating indications are in the normal range, whichever is longer.

**D. Engine High Power Schedule Switch <JAA>**

Use of the HIGH PWR SCHEDULE switch is prohibited.



**LIMITATIONS  
Power Plant**

02-05-2

Sep 09/02

**2. ENGINE OPERATING LIMITS**

**A. Engine Operating Limits Table**

LIMIT	GROUND START <sup>3</sup>	ASSISTED AIR START <sup>4</sup>	WINDMILL START <sup>4</sup>	IDLE	MAXIMUM CONTINUOUS	NORMAL TAKE-OFF (TOGA) <sup>1</sup>	APR <sup>2</sup> (MAX POWER) <sup>1</sup>
N <sub>1</sub>	-	-	-	20 - 25%	99.5%	99.5%	99.5%
ITT	815°C	815°C	927°C	-	960°C	963°C (2 min)	1006°C (2 min)
	-	-	-	-	-	947°C (5 min)	990°C (5 min)
N <sub>2</sub>	0 - 45%	0 - 45 %	-	55 - 65%	98.0%	99.4%	99.4%
OIL TEMP	-40°C (minimum)				155°C	163°C (15 min)	163°C (15 min)
OIL PRESS	182 psi <sup>7</sup> 95 psi (after 10 min)	182 psi <sup>7</sup> 95 psi (after 10 min)	182 psi <sup>7</sup> 95 psi (after 10 min)	25-60 psi <sup>6</sup> 25-95 psi (oil temp <60°C)	45-95 psi <sup>5 6</sup>	45-95 psi <sup>5 6</sup>	45-95 psi <sup>5 6</sup>
MINIMUM OIL LEVEL FOR FLIGHT <sup>8</sup>	40% minimum with affected engine not started.	-	-	-	-	-	-

1. Normal take-off power and Maximum power (two engines) is limited to 5 minutes.
2. APR power (one engine) is limited to 10 minutes.
3. ITT must be below 120°C before attempting to ground start engine.
4. ITT must be below 90°C before attempting to air start engine.
5. Maximum oil pressure is limited to 156 psi when oil temperature transient is less than 60°C.
6. Oil pressures (above IDLE) between 25 psi and 45 psi require oil temperature monitoring.
7. Oil pressures should show positive value during start and may peak beyond 182 psi (max display value). Oil pressures above 182 psi are displayed as amber dashes. Oil pressure may be greater than 95 psi for a maximum of 10 minutes.
8. For further details, refer to the Flight Crew Operating Manual, Vol.1, CSP C-013 - POWER PLANT - OIL SYSTEM.





**LIMITATIONS  
Power Plant**

02-05-3

Sep 09/02

**2. ENGINE OPERATING LIMITS (CONT'D)**

**B. Airplane Cold Soak**

Before the first flight of a day, when the airplane is cold-soaked at an ambient temperature of  $-30^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$ ) or below for more than 8 hours:

- The engines must be motored for 60 seconds and the fan rotation must be verified before an engine start is initiated.
- The thrust reversers must be actuated until the deploy and stow cycles are 2 seconds or less.

**3. CONTINUOUS ENGINE IGNITION**

Continuous engine ignition must be used during the following:

- Take-offs and landings on contaminated runways;
- Flight through moderate or heavier intensity rain;
- Flight through moderate or heavier intensity turbulence;
- Flight in the vicinity of thunderstorms.

**4. STARTER CRANKING LIMITS**

The starter must not be used if indicated  $\text{N}_2$  rpm exceeds 45%.

**A. Engine Start (Ground)**

START	MAXIMUM TIME ON	FOLLOWED BY
1 & 2	60 seconds	10 seconds cool down
3 through 5	60 seconds	5 minutes cool down

**B. Engine Start or Motoring (Flight)**

START / MOTORING	MAXIMUM TIME ON	FOLLOWED BY
1 & 2	120 seconds	10 seconds cool down
3 through 5	60 seconds	5 minutes cool down

**C. Motoring (Ground)**

MOTORING	MAXIMUM TIME ON	FOLLOWED BY
1	90 seconds	5 minutes cool down
2 through 5	30 seconds	5 minutes cool down

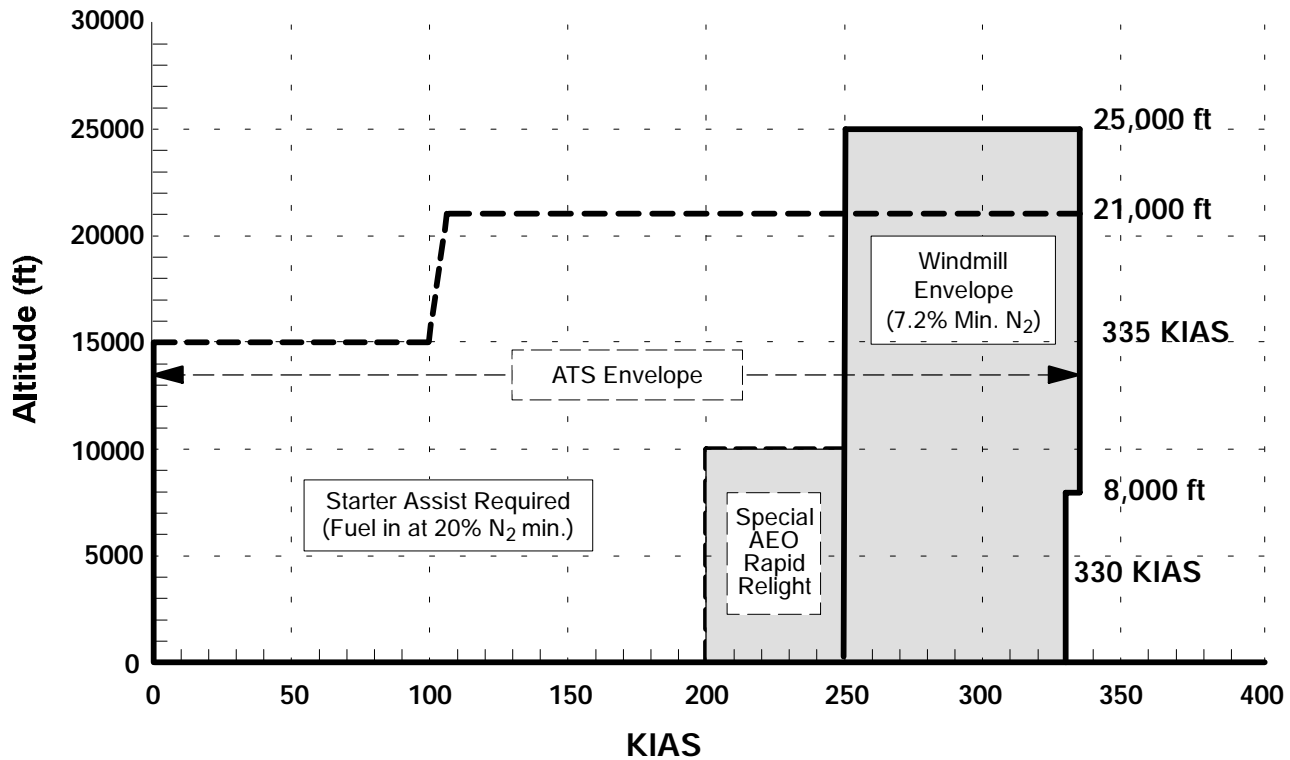
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CSP C-012**

5. ENGINE RELIGHT

RELIGHT TYPE	ENVELOPE (Figure 02-05-1)
Windmilling	Altitude from 25,000 feet to sea level: Speed 250 KIAS to $V_{MO}$ and 7.2% $N_2$ minimum.
Starter-assisted	Altitude from 21,000 feet to sea level: Speed from $V_{REF}$ up to $V_{MO}$ and from 0 to 45% $N_2$ .
All-Engine-Out Rapid Relight	Altitude from 10,000 feet to sea level: FADEC rapid relight capability has been demonstrated at 200 KIAS for up to 15-second fuel interruptions.

Engine starting is only permitted within the envelope defined in Figure 02-05-1, below. The ATS procedure envelope applies to stabilized windmill.



NOTE: Special All-Engine Out Rapid Relight Envelope, from 10,000 feet to S. L. and 200 to 250 KIAS.

Engine Start Envelope  
Figure 02-05-1



**LIMITATIONS  
Power Plant**

02-05-5

REV 2, Feb 24/04

**6. FUEL**

*Pending Rectification:*

Centre tank fuel quantity must be monitored throughout flight.

The maximum permissible fuel imbalance between the contents of the main left tank and the main right tank are given below:

- During take-off - 136 kg (300 lb)
- All other phases of flight - 363 kg (800 lb)

Fuel remaining in a tank when the appropriate fuel quantity indicator reads zero is not usable.

The fuel quantities below are based on 6.75 lb/per US gal. The maximum usable fuel load for each fuel tank is given below:

	Pressure Refueling	Gravity Refueling
Left main tank	3,398 kg (7,492 lb)	3,359 kg (7,405 lb)
Right main tank	3,398 kg (7,492 lb)	3,359 kg (7,405 lb)
Centre tank	2,091 kg (4,610 lb)	
<b>Total</b>	<b>8,888 kg (19,595 lb)</b>	<b>6,718 kg (14,810 lb)</b>

Take-off with a fuel load in excess of 227 kg (500 lb) in the centre tank is not permitted unless each main wing tank is above 1,996 kg (4,400 lb).

The minimum fuel quantity for go-around is 272 kg (600 lb) per wing (with the airplane level) and assuming a maximum airplane climb attitude of 10° nose up.

Dispatch with the fuel quantity gauging system inoperative is prohibited.

**A. Fuel Temperature**

- Take-off with engine fuel temperature indications below 5°C (41°F) is prohibited.
- Take-off with bulk fuel temperature indications below the limits stated is prohibited.
- During flight, bulk fuel temperature must remain above the applicable bulk fuel freezing point.

Fuel	Bulk Fuel Take-off Limit	Bulk Fuel Freezing Point
ASTM D 1655 JET A	-30°C	-40 °C
ASTM D 1655 JET A1	-37°C	-47 °C
MIL T-5624 JP 5	-36°C	-46 °C
MIL T-83133 JP 8	-40°C	-50 °C
GB6537-94 No. 3 Jet	-37°C	-47°C

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**Airplane Flight Manual  
CSP C-012**



**LIMITATIONS  
Power Plant**

02-05-6

REV 2, Feb 24/04

**B. Fuel Grades**

- Fuels conforming to any of the following specifications are approved for use. Mixing of fuels is permitted.

CANADIAN	AMERICAN	BRITISH	ROMANIAN	CHINESE
CAN 2 - 3.23	ASTM D1655 JET A	DEF. STAN 2494		
CAN 2 - 3.23	ASTM D1655 JET A1	DEF. STAN 2494	STAS 5639/88 TH †	GB6537-94 No. 3 Jet
-	MIL-T-83133 JP-8	DEF. STAN 2453		
-	MIL-T-5624 JP-5	DEF. STAN 2452		
† Fuel additives restricted to those listed in paragraph C. (below) and / or antistatic STADIS-450 (max 3 ppm).				

**C. Fuel Additives**

The following additives, used individually or in combination, are approved:

- Anti-icing additives to the latest revision of specification MIL-I-27686E or any direct equivalent at a concentration of 0.10 to 0.15% by volume.
- Anti-icing Methyl Cellosolve at concentrations of 0.10 to 0.15% by volume.
- SOHIO Biobor JF biocide additive at a concentration not in excess of 270 parts per million (20 parts per million elemental boron) to prevent the growth of micro-organisms.
- Shell ASA-3 anti-static additive at a concentration that will provide not in excess of 300 conductivity units, which is approximately equivalent to 1 part per million.

**D. Fuel Crossflow**

- Powered crossflow and gravity crossflow must be off for take-off.



## LIMITATIONS Power Plant

02-05-7

Sep 09/02

### 7. OIL GRADES

#### NOTE

Mixing of different types of oils is prohibited.

COMPONENT	MIL-L-23699 (TYPE II)	MIL-L-7808 (TYPE I)	CASTROL 4000
Engines	✓	✓	✓
Air Turbine Starter	✓	✓	✓
Integrated Drive Generator	✓	✓	✓
Auxiliary Power Unit	✓	✓	✓

### 8. OIL CONSUMPTION

Maximum oil consumption, on each engine, is 189 cubic centimeter per hour (6.4 US ounces per hour 0.05 US gallons per hour).

### 9. ENGINE OIL LEVEL

Engine oil levels must be checked as follows:

- The maximum duration without engine oil servicing is 36 operating hours.
- For airplane operations in excess of 36 operating hours (without engine oil tank servicing), the engine oil level must be checked within 3 minutes to 1 hour after every engine shutdown.

### 10. OIL REPLENISHMENT SYSTEM

If use of the oil replenishment system is required, then the engine(s) should be replenished within 15 minutes to 1 hour after engine shutdown.

Maximum refill allowable is 1890 cubic centilitres (2 US quarts) without dry motoring the engine.

If the oil system has to be replenished to maximum capacity and the replenishment period has been exceeded, the engine(s) must be dry motored and the level rechecked.

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**LIMITATIONS  
Power Plant**

02-05-8

Sep 09/02

**11. AUXILIARY POWER UNIT**

**A. Type:** Allied Signal RE 220 (RJ)

**B. Maximum RPM:** 106%

**C. Starting:**

- (1) Minimum ambient temperature for starting a cold soaked APU on the ground is -40°C.
- (2) Maximum EGT (dependant upon altitude and temperature):
  - 0 to 100% RPM - 692°C to 1038°C
- (3) The APU starter motor duty cycle is as follows:
  - Do not perform more than three starts / start attempts in one hour.

**NOTE**

A two - minute delay must be observed between cranking attempts to allow for cooling of starter and starter contactor and for APU drainage.

**D. Operating Range:**

- (1) Maximum EGT, APU on-speed (dependant upon altitude and temperature):
  - Ground - 682°C to 789°C
  - In flight - 773°C to 806°C
- (2) Maximum EGT:
  - 1038°C (not to be exceeded under any operating conditions).
- (3) APU starting and operation is permitted within the following operating envelope:
  - Start and Operating Limits. Refer to Figure 02-05-2.
  - Altitude and Airspeed. Refer to Figure 02-05-3.



**LIMITATIONS  
Power Plant**

02-05-9

REV 2, Feb 24/04

**11. AUXILIARY POWER UNIT (CONT'D)**

**E. APU Bleed Air**

<b>APU BLEED AIR LIMITATIONS</b>	
<b>System / Condition</b>	<b>Limitation</b>
Bleed air extraction	APU bleed air extraction is not permitted above 25,000 feet.
Engine-start during ground operations	No bleed air extraction limitation. Each engine may be started using the APU as a bleed air source.
Engine-start during flight	APU bleed air extraction is limited to 25,000 feet and below.

**F. APU Generator**

The maximum permissible load on the APU generator is 40 kVA.

**G. APU Indications**

The APU limit display markings on the EICAS must be used to determine compliance with the maximum limit and precautionary ranges. If EICAS markings show more conservative limits than those specified below, the limit markings on the EICAS should be used.

**NOTE**

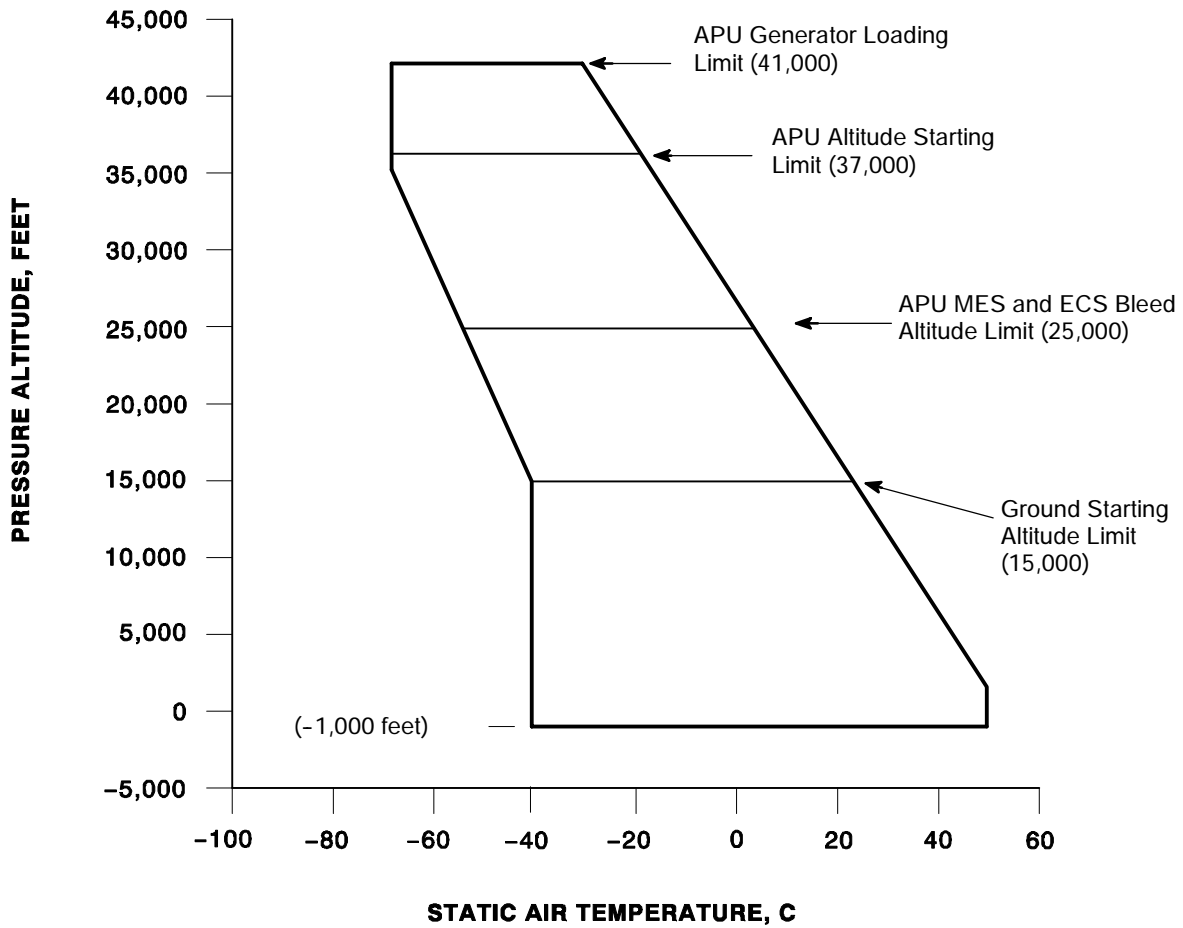
Red - Maximum Limitation  
Green - Normal operating range

<b>INDICATION</b>	<b>RED</b>	<b>GREEN</b>
APU EGT °C	807	0 to 806
APU RPM %	107	0 to 106

|

11. AUXILIARY POWER UNIT (CONT'D)

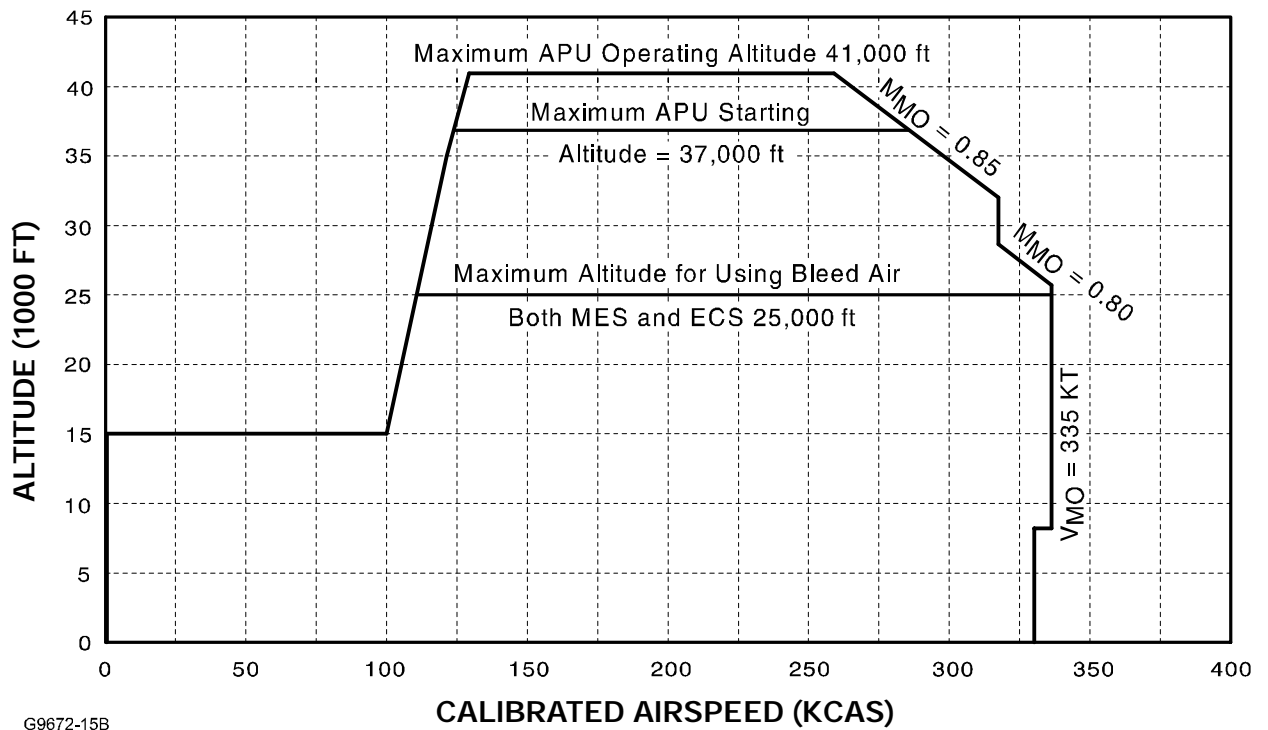
STARTING and OPERATING ENVELOPE



APU Start and Operating Limits  
Figure 02-05-2



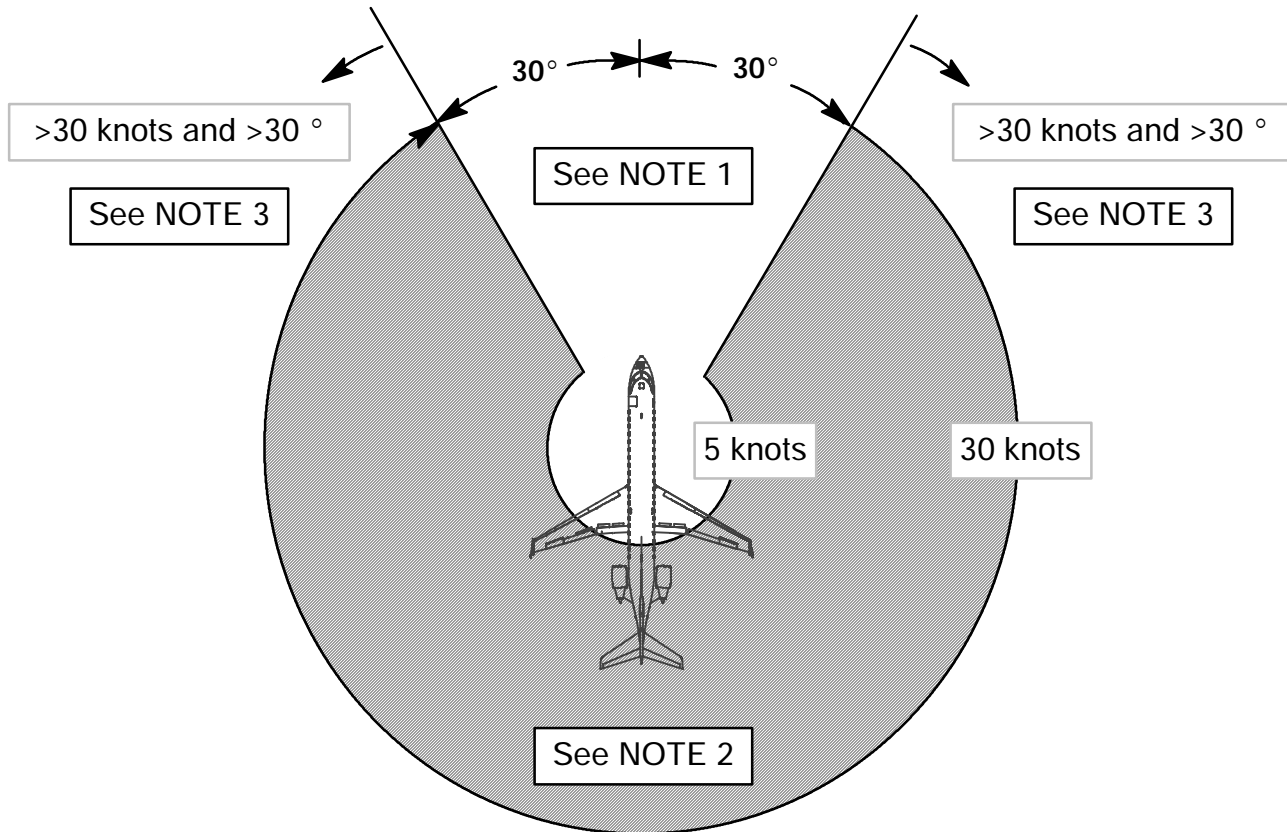
**11. AUXILIARY POWER UNIT (CONT'D)**



APU Altitude and Airspeed Chart  
Figure 02-05-3

12. ENGINE OPERATING PROCEDURE LIMITS DUE TO WIND

Wind and fan speed limitations as shown in the illustration below must be observed:



	Wind Condition	Limitation
NOTE 1	30 ° either direction from airplane nose; no windspeed limit OR >30 ° either direction from airplane nose; <5 knots windspeed.	No limitations - TOGA thrust. NORMAL TAKE-OFF PROCEDURE applies (refer to the Flight Crew Operating Manual (CSP C-013), Volume 2 - NORMAL PROCEDURES - TAKE-OFF - Normal Take-Off Procedure).
NOTE 2	>30 ° either direction from airplane nose; between 5 and 30 knots windspeed.	75% N <sub>1</sub> before brakes release, then TOGA thrust. CROSSWIND TAKE-OFF PROCEDURE applies (refer to the Flight Crew Operating Manual, Volume 2 - NORMAL PROCEDURES - TAKE-OFF - Crosswind Take-Off Procedure).
NOTE 3	>30 ° either direction from airplane nose; >30 knots windspeed.	After brakes release, set thrust smoothly to reach TOGA by 60 KIAS. ROLLING TAKE-OFF PROCEDURE applies (refer to the Flight Crew Operating Manual, Volume 2 - NORMAL PROCEDURES - TAKE-OFF - Rolling Take-Off Procedure).

Engine Operating Limits Due to Wind  
Figure 02-05-4

## 1. MAXIMUM OPERATING SPEED AND MACH NUMBER

Maximum operating limit speeds as given in Figure 02-06-1, must not be deliberately exceeded in any regime of flight (climb, cruise or descent), unless a higher speed is specifically authorized for flight test or training operations.

*Effectivity: <1030>*

- Airplanes **equipped** for operation in Reduced Vertical Separation Minimum (RVSM) airspace:

## 2. RVSM MAXIMUM CRUISE MACH NUMBER

The maximum cruise Mach number during flight in RVSM airspace is 0.82.

## 3. DESIGN MANEUVERING SPEED

Full application of rudder and aileron controls as well as maneuvers that involve angles of attack near the stall, must be confined to speeds below  $V_A$ . Values of  $V_A$  are given in Figure 02-06-2, for varying pressure altitudes and airplane weights.



Avoid rapid and large alternating control inputs, especially in combination with large changes in pitch, roll, or yaw (e. g., large side slip angles) as they may cause structural failure at any speed, including below  $V_A$ .

## 4. FLAPS EXTENDED SPEED

The maximum speeds at which the flaps may be extended are:

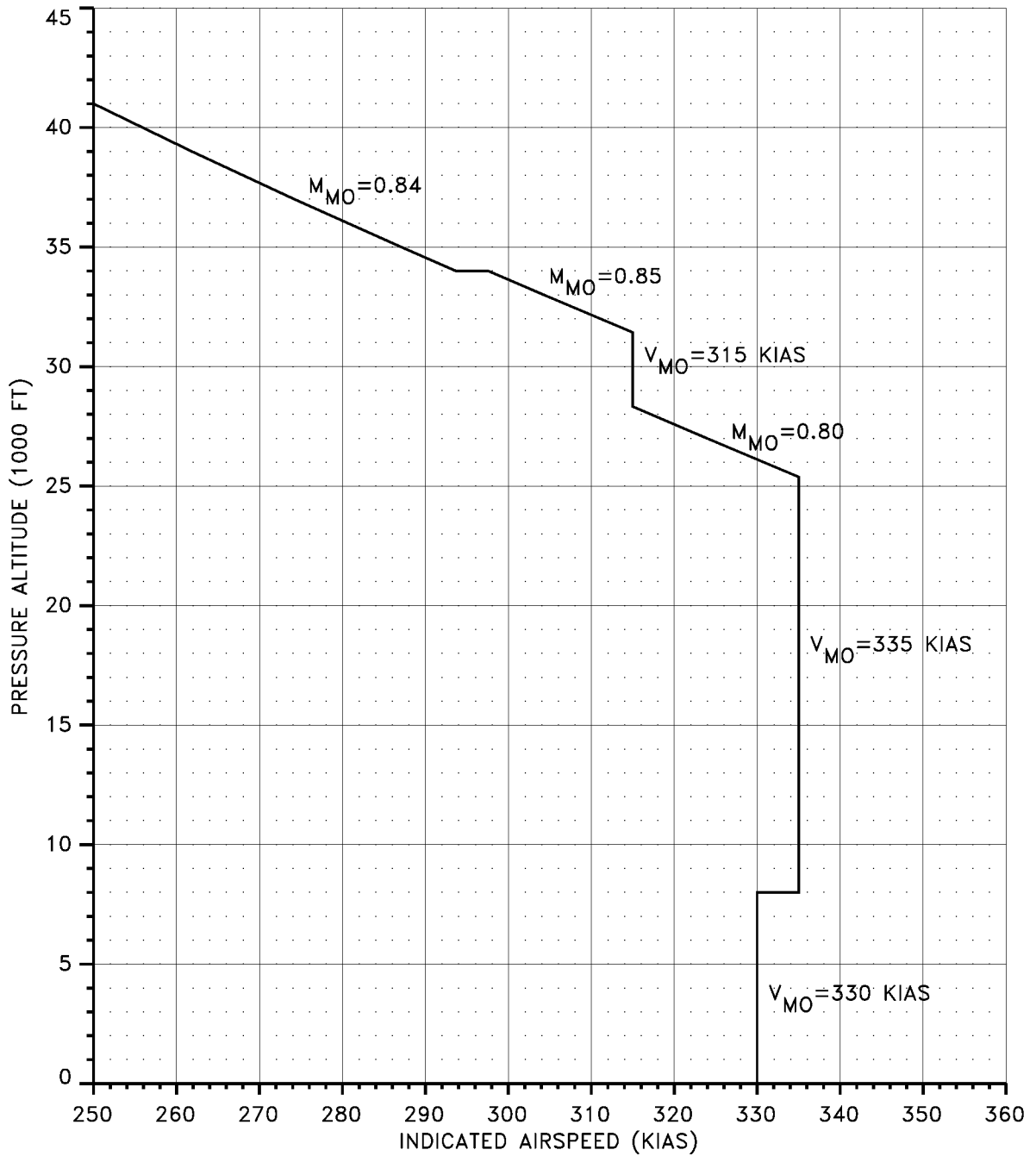
FLAPS 1:	230 KIAS
FLAPS 8:	230 KIAS
FLAPS 20:	220 KIAS
FLAPS 30:	185 KIAS
FLAPS 45:	170 KIAS

## 5. MAXIMUM LANDING GEAR OPERATING SPEED

- The maximum airspeed at which it is safe to extend the landing gear is 220 KIAS.
- The maximum airspeed at which it is safe to retract the landing gear is 200 KIAS.

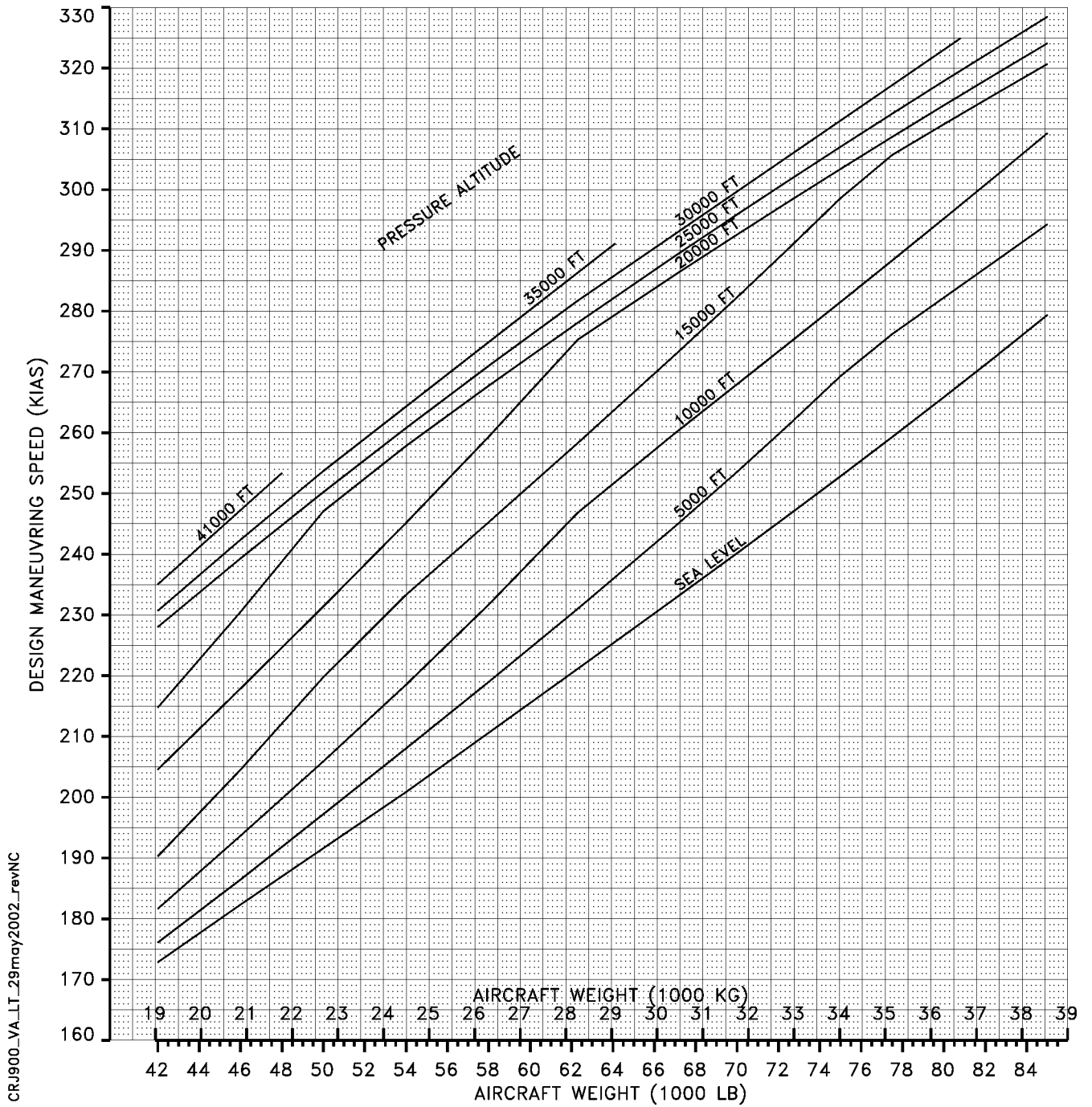
## 6. MAXIMUM LANDING GEAR EXTENDED SPEED

The maximum airspeed at which the airplane may be flown with the landing gear extended and locked is 220 KIAS.



CRJ900\_EP: VMO\_MMO\_JP\_11FEB2005

Maximum Operating Speed and Mach Number  
Figure 02-06-1



CRJ900\_VA\_LT\_29may2002\_revNC

Design Maneuvering Speeds  
Figure 02-06-2



**LIMITATIONS  
Operating Speeds**

02-06-4

REV 2, Feb 24/04

**| 7. TIRE LIMIT SPEED**

The tire limit speed is 195 knots ground speed.

**| 8. MAXIMUM AIRSPEED FOR ADG OPERATION**

The maximum speed for ADG operation is  $V_{MO}/M_{MO}$ .

**| 9. TURBULENCE PENETRATION SPEED**

Maximum air speed for turbulence penetration is 280 KIAS or 0.75 Mach, whichever is lower.

**| 10. MINIMUM OPERATING LIMIT SPEED**

Intentional speed reduction below the onset of stall warning, as defined by stick shaker operation, is prohibited unless a lower speed is specifically authorized for flight test or training operations.

**| 11. WINDSHIELD WIPER OPERATION**

The windshield wiper must not be operated above 250 KIAS.

If the windshield wiper has failed in a non-parked position, the airplane speed must not exceed 250 KIAS.



**LIMITATIONS**  
**Maneuvering Loads**

02-07-1

Sep 09/02

**1. MANEUVERING LIMIT LOAD FACTORS**

These load factors limit the permissible angles of bank in turns and the severity of pull-up and push-over maneuvers:

Flaps up: -1.0 G to 2.5 G

Flaps down: 0.0 G to 2.0 G

**2. SIDE SLIP MANEUVERS**

Avoid unnecessary and large side-slip maneuvers during low speed high altitude cruise.

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**LIMITATIONS  
Maneuvering Loads**

02-07-2

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# LIMITATIONS Systems Limitations

02-08-1

REV 2, Feb 24/04

## 1. AIR-CONDITIONING AND PRESSURIZATION

- The maximum relief differential pressure is 8.7 psi. The maximum negative differential pressure is -0.5 psi.
- During taxi, take-off and landing, the pressure differential must not exceed 0.1 psi.
- The airplane must be completely depressurized prior to opening any of the airplane doors.
- The maximum altitude for single pack operation is 25,000 feet.
- To preclude possible crew and/or passenger ear damage, use of the EMER DEPRESS switch above 15,000 feet is prohibited.

## 2. AUTOMATIC FLIGHT CONTROL SYSTEM

- Operation with the autopilot engaged is prohibited at altitudes below 600 feet AGL, except when performing the following:
  - For visual and non-precision approaches, the minimum autopilot use height is 400 feet AGL.
  - For precision approaches (ILS), with both engines operating, the minimum autopilot use height is 80 feet AGL.
  - For precision approaches (ILS), with one engine inoperative, the minimum autopilot use height is 110 feet AGL.
- Operations with an ILS glidepath angle that exceeds 3.5 degrees are prohibited.

*Effectivity: <1030>*

- Airplanes **equipped** for operation in Reduced Vertical Separation Minimum (RVSM) airspace:
- The ADC source coupled to the active autopilot must be the same as that coupled to the ATC transponder during flight in RVSM airspace.

## 3. ELECTRICAL SYSTEMS

### A. Permissible Loads on AC System

Individual AC generator loading must not exceed the following values:

ALTITUDE (FEET)	LOAD LIMITATION (KVA)	
	MAIN GENERATOR (EACH)	APU GENERATOR
0 - 41,000	40	40

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CSP C-012**



**LIMITATIONS  
Systems Limitations**

02-08-2

REV 3, May 03/05

**3. ELECTRICAL SYSTEMS (CONT'D)**

**B. Permissible Loads on DC Systems**

(1) In Flight

The maximum permissible continuous load on each TRU is 120 amps.

(2) Ground Operation

To protect the flight compartment CRT displays, the maximum permissible time for ground operations with DC power only is 5 minutes.

**C. Circuit Breaker Reset (In Flight)**

A circuit breaker must not be reset or cycled (i. e., opened or closed) unless doing so is consistent with explicit procedures specified in this Airplane Flight Manual or unless, in the judgement of the Pilot-in-Command, that resetting or cycling of the circuit breaker is necessary for the safe completion of the flight.

**4. FLIGHT CONTROLS - LIFT/DRAG DEVICES**

**A. Slats / Flaps**

- En-route use of slats / flaps is prohibited.
- Flight with slats / flaps extended at altitudes above 15,000 feet is prohibited.

**B. Flight Spoilers**

Flight spoilers must not be extended in flight below an altitude of 300 feet AGL.

To ensure adequate maneuver margins, flight spoilers must not be extended in flight at airspeeds below the recommended approach speed plus 10 KIAS (refer to PERFORMANCE - LANDING PERFORMANCE).

**5. STALL PROTECTION SYSTEM**

Both stall protection system switches must remain on for all phases of flight.

**6. THRUST REVERSERS**

- Thrust reversers are approved for ground use only, activation of the reverse thrust levers is prohibited in-flight.
- The thrust reversers are intended for use during full stop landings. Do not attempt a go-around maneuver after deployment of the thrust reversers.
- Take-off with any thrust reverser icons or EICAS warning and/or caution messages displayed is prohibited.
- During landing, application of maximum reverse thrust is not permitted at airspeeds below 60 KIAS. Below 60 KIAS, reverse thrust should be reduced to idle.
- During pre-flight check of the thrust reversers with the airplane stationary, reverse thrust must be limited to reverse idle.
- Backing-up using thrust reversers is prohibited.

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CSP C-012**



**LIMITATIONS**  
**Systems Limitations**

02-08-3

REV 2, Feb 24/04

**7. NOSE WHEEL STEERING SYSTEM**

Towbarless towing is prohibited <JAA>.

**8. TAXI LIGHTS**

The taxi lights must be switched OFF whenever the airplane is stationary in excess of 10 minutes.

**9. WHEEL BRAKE COOLING LIMITATIONS**

Brake cooling times (established in accordance with PERFORMANCE - TAKE-OFF PERFORMANCE - MAXIMUM ALLOWABLE BRAKE TEMPERATURE FOR TAKE-OFF) must be observed between a landing or a low-energy rejected take-off (RTO) and a subsequent take-off, to ensure that sufficient brake energy is available to bring the airplane to a complete stop, if the subsequent take-off is rejected.

**10. MINIMUM DESCENT ALTITUDE**

When setting the MDA marker on the barometric altimeter using the DH/MDA knob on the altitude reference panel, the next highest 10 foot increment must be selected if the altitude is not at a 10 foot increment.

**11. TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS)**

Pilots are authorized to deviate from their Air Traffic Control (ATC) clearance in order to comply with a TCAS resolution advisory (RA) command.

**12. INTEGRATED STANDBY INSTRUMENT (ISI)**

**Flight Operations**

- When NAV 1 is tuned to a valid ILS frequency, the ISI will display localizer and glideslope deviation while on the backcourse approach. Use of the ISI localizer and backcourse information is prohibited during backcourse approaches.

**13. CONFIGURATION DEVIATION LIST**

If the aircraft is to be operated with certain secondary airframe and/or any nacelle parts missing, operation must be in accordance with the limitations specified in the basic Airplane Flight Manual, and as amended by the Configuration Deviation List.

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#### 14. ENHANCED GROUND PROXIMITY WARNING SYSTEM (EGPWS)

##### General <2040>

- The system must be operated in accordance with the Enhanced Ground Proximity Warning System Pilot's Guide P/N 060-4241-0000 REV B or later applicable edition.
- Pilots are authorized to deviate from their current air traffic control (ATC) clearance to the extent necessary to comply with an EGPWS.



When there is no GPS input, the EGPWS may fail to alert when a terrain threat exists, during ambient surface temperatures below ISA, during non-standard temperature lapse rates or if incorrect barometric settings are set on the altimeter <2040, 1027 & 2040, 1047 & 2040>.

##### System Limitations <2040>

- The terrain data base, terrain displays and alerting system do not account for man-made obstructions, except for all known man-made obstructions in Canada, the United States and Mexico.
- Airplane navigation must not be predicated upon the use of the terrain display.
- To avoid giving unwanted alerts, the terrain awareness alerting and display functions must be inhibited by selecting the GRND PROX, TERRAIN switch OFF when within 15 nm of take-off, approach or landing of an airport not contained in the EGPWS airport database.

##### Terrain Avoidance Maneuvering <2040>

- The terrain display provides situational awareness only, and may not provide the accuracy and / or fidelity upon which to solely base terrain avoidance maneuvering.
- When an enhanced ground proximity system alert, caution, or warning occurs, a standard GPWS escape maneuver must be initiated. Only vertical maneuvers are recommended, unless operating in visual meteorological conditions (VMC) and / or the pilot determines, based upon all available information, that turning in addition to the vertical escape maneuver is the safest course of action.

##### Both GPS Inoperative <1027 & 2040>

- With both GPS sensors inoperative <1027 & 2040>, the GRND PROX, TERRAIN switch should be selected to OFF unless the FMS position has been updated within five (5) minutes prior to take-off.
- With both GPS sensors inoperative <1027 & 2040>, the terrain awareness alerting and display system must be inhibited by selecting the GRND PROX, TERRAIN switch to OFF during QFE operations.



**LIMITATIONS**  
**Systems Limitations**

02-08-5

REV 2, Feb 24/04

**15. PNEUMATIC SYSTEM**

- Wing and / or cowl anti-ice selection is prohibited with the APU as a bleed source in manual mode.

**16. MULTI-FUNCTION DISPLAYS**

- Flicker may occur on the MFD with a large number of FMS symbols selected for display and larger ranges selected. To manually declutter the MFD:
  - Reduce range selected,
  - Deselect TCAS overlays,
  - Deselect radar / terrain overlays,
  - Deselect some of the FMS symbology.

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**LIMITATIONS**  
**Systems Limitations**

02-08-6

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**CSP C-012**



**LIMITATIONS**  
**Navigation Systems Limitations**

02-09-1

REV 2, Feb 24/04

**1. FLIGHT MANAGEMENT SYSTEM**

• **Options <1214>:**

Airplanes equipped with FMS-4200 (FMC 822-0783-015) (SCID 832-4119-016):

- The flight management system (FMS) must be operated in accordance with the latest edition of the following:
  - Airplane Flight Manual, and
  - Flight Management System Pilot Guide, part number 523-0778363.
- The FMS installation meets the requirements of JAA Temporary Guidance Leaflet No. 2, Rev. 1: AMJ 20X2-JAA Guidance Material on Airworthiness Approval and Operational Criteria for Use of Navigation Systems in European Airspace Designated for Basic RNAV Operations.
- The FMS is approved for use only with software program version SCID 832-4119-016.
- ILS, LOC, LOC-BC, LDA, SDF and MLS approaches using the FMS are prohibited.
- The FMS is approved for use only during enroute, terminal and non-precision approach phases of flight.
- FMS range and fuel management information is advisory only.
- IFR enroute and terminal navigation is prohibited unless the pilot verifies the currency of the database or verifies waypoints for accuracy by reference to current publications.
- Instrument approaches must be accomplished with instrument approach procedures that are retrieved from the FMS database. The FMS must incorporate the current update cycle. The pilot must verify approach waypoints for accuracy by reference to current publications.
- The VNAV system information is not temperature compensated. FMS generated altitudes and V-paths are not corrected for non-ISA conditions.
- The FMS meets the enroute, terminal and non-precision approach lateral performance / accuracy criteria of AC 20-130A.
- Operations with a VNAV final approach glidepath angle that exceeds 3.5 degrees are prohibited.
- The approach must not be continued past the final approach fix if an FMS "NO APPR" message is displayed on the PFD.

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**CSP C-012**



**LIMITATIONS**  
**Navigation Systems Limitations**

02-09-2

REV 3, May 03/05

**1. FLIGHT MANAGEMENT SYSTEM (CONT'D)**

- The FMS installation meets the airworthiness certification requirements of JAA Temporary Guidance Leaflet No. 10, Airworthiness and Operational Approval for Precision RNAV Operations in Designated European Airspace, except for the database integrity requirements of TGL 10 section 8.2.
- Precision RNAV operations must not be conducted unless all of the required equipment specified below is operational.

<b>PRNAV REQUIRED EQUIPMENT LIST</b>	
<b>EQUIPMENT</b>	<b>REQUIREMENTS FOR PRNAV</b>
FLIGHT MANAGEMENT COMPUTER (2) <1214>	ONE (1) MUST BE OPERATIONAL.
FMS CONTROL DISPLAY UNIT (2) <1214>	ONE (1) MUST BE OPERATIONAL.
VHF NAV (2), DME (2)	One (1) VHF NAV and one (1) DME must be operational.
VHF NAV (2), DME (2), GPS (2) <1027>	One (1) VHF NAV and one (1) DME must be operational, or one (1) GPS is operational.
IRS (2) <1025>	One (1) must be operational. IRS ONLY message must not be displayed.

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**CSP C-012**





**LIMITATIONS**  
**Navigation Systems Limitations**

02-09-3

REV 3, May 03/05

**2. GLOBAL POSITIONING SYSTEM**

- **Options <1027> :**
  - Other approved navigation equipment appropriate to the route of flight (enroute and terminal) must be installed and operating.
  - The GPS may only be used for approach guidance if the reference coordinate data system for the instrument approach is WGS-84 or NAD-83.
  - The area navigation system used for IFR Class 1 navigation meets the performance / accuracy criteria of AC 20-130A for enroute and terminal area navigation.
- **Option <1027>:**
  - The dual GPS installation, when used in conjunction with the Prediction Program 832-3443-005 and with two operational FMS-4200 systems, has been found to comply with the requirements of MNPS operations and as a primary means of navigation in oceanic and remote airspace operations. Likewise, this compliance is considered as meeting RNP-10 requirements, without time limitations.

**NOTE**

The demonstration of performance with the above criteria does not constitute approval to conduct MNPS, oceanic / remote airspace or RNP-10 operations.

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