

LIMITATIONS
TABLE OF CONTENTS

CHAPTER 2 - LIMITATIONS

	Page
TABLE OF CONTENTS	02-00-1
INTRODUCTION	
Introduction	02-01-1
General	02-01-1
Kinds of Airplane Operation	02-01-1
STRUCTURAL WEIGHT	
Structural Weight	02-02-1
Structural Weight Limitations	02-02-1
Buoyancy Limitations	02-02-1
CENTRE OF GRAVITY	
Centre of Gravity	02-03-1
Centre Of Gravity Limits	02-03-1
OPERATING LIMITATIONS	
Operating Limitations	02-04-1
Altitude and Temperature Operating Limit	02-04-1
Operation in Icing Conditions	02-04-3
Runway Slopes	02-04-4
Tailwind Conditions	02-04-4
Minimum Flight Crew	02-04-4
Maximum Occupants	02-04-4
Cold Weather Operations	02-04-4
Runway Surface Condition	02-04-5
Minimum Enroute Climb Gradient and Clearance	02-04-5
POWER PLANT	
Engine Operating Limits	02-05-1
Type	02-05-1
Engine Operating Limits Table	02-05-1
Cold Weather Operations	02-05-1
Thrust Management Data	02-05-1
Maximum Wind Speed and Direction	02-05-1

LIMITATIONS
TABLE OF CONTENTS

	Page
POWER PLANT	
Starter Cranking Limits (Ground and Air)	02-05-2
General	02-05-2
Engine Start	02-05-2
Dry Motoring / Cranking Cycle	02-05-2
Engine Air Start Envelope	02-05-3
Fuel	02-05-4
Fuel Imbalance	02-05-4
Usable Fuel Load	02-05-4
Fuel Distribution	02-05-4
Minimum Fuel Quantity for Go-around	02-05-5
Fuels and Fuel Additives	02-05-5
Engine Fuel Temperature	02-05-7
Fuel Crossfeed	02-05-7
Fuel Recirculation System	02-05-7
Oil	02-05-7
Oil Temperature	02-05-7
Oil Pressure	02-05-8
Oil Grades	02-05-8
Oil Consumption	02-05-8
Oil Replenishment	02-05-8
Autothrottle	02-05-9
Take-Off	02-05-9
Landing	02-05-9
Auxiliary Power Unit	02-05-9
Type	02-05-9
Maximum RPM	02-05-9
Maximum EGT	02-05-9
Maximum Operating Altitude	02-05-9
Starting	02-05-9
Bleed Air Extraction Limit	02-05-9
OPERATING SPEEDS	
Operating Speeds	02-06-1
Maximum Operating Speed and Mach Number	02-06-1

**LIMITATIONS
TABLE OF CONTENTS**

	Page
OPERATING SPEEDS	
Design Maneuvering Speed	02-06-2
Slat/Flap Extended Speed	02-06-4
Maximum Landing Gear Operating Speed	02-06-4
Maximum Landing Gear Extended Speed	02-06-4
Tire Limit Speed	02-06-4
Turbulence Penetration Speed	02-06-4
Minimum Operating Limit Speed	02-06-4
MANEUVERING LOADS	
Maneuvering Loads	02-07-1
Maneuvering Limit Load Factors	02-07-1
SYSTEMS	
Systems	02-08-1
Air-Conditioning and Pressurization	02-08-1
Automatic Flight Control System	02-08-1
APU Generator	02-08-2
Flight Spoilers	02-08-2
Stall Protection System	02-08-2
Thrust Reversers	02-08-2
Wheel Brake Cooling Limitations	02-08-2
Traffic Alert And Collision Avoidance System (TCAS)	02-08-2
Flight Controls – Flaps	02-08-2
Configuration Deviation List	02-08-3
Nose Wheel Steering System	02-08-3
Enhanced Ground Proximity Warning System (EGPWS)	02-08-3
RAT Generator test	02-08-3
NAVIGATION SYSTEMS	
Navigation Systems	02-09-1
Flight Management System	02-09-1
Standby Instrument	02-09-3
Mode S Transponder Systems for Enhanced Surveillance	02-09-4

LIMITATIONS
TABLE OF CONTENTS

Page

ELECTRICAL MANAGEMENT SYSTEM

Circuit Breakers for Disabled Systems	02-10-1
Green Airplanes	02-10-1
EMS CDU Switch Control Page Settings	02-10-3
Green Airplanes 9005 and Subsequent	02-10-3

LIST OF ILLUSTRATIONS

CENTRE OF GRAVITY

Figure 02-03-1	Centre of Gravity (CG) Envelope	02-03-2
----------------	---------------------------------	---------

OPERATING LIMITATIONS

Figure 02-04-1	Altitude and Temperature Operating Limit	02-04-2
----------------	--	---------

POWER PLANT

Figure 02-05-1	Engine Air Start Envelope	02-05-3
Figure 02-05-2	Engine Oil Pressure Limits	02-05-8

OPERATING SPEEDS

Figure 02-06-1	Maximum Operating Speed and Mach Number	02-06-1
Figure 02-06-2	Design Maneuvering Speeds	02-06-3

LIMITATIONS INTRODUCTION

1. INTRODUCTION

A. General

The limitations included in this chapter contain items peculiar to the GLOBAL 5000® airplane. Observance of these limitations is mandatory.

B. Kinds of Airplane Operation

The airplane is certified 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

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

The airplane is certified for flight in icing conditions.

The airplane is not to be used for transportation of passengers or cargo unless it has been completed by the installation of an approved interior.

LIMITATIONS INTRODUCTION

THIS PAGE INTENTIONALLY LEFT BLANK

LIMITATIONS STRUCTURAL WEIGHT

1. STRUCTURAL WEIGHT

A. Structural Weight Limitations

Maximum taxi and ramp weight:	39,893 kg (87,950 lb)
Maximum take-off weight:	39,780 kg (87,700 lb)
Maximum landing weight:	35,652 kg (78,600 lb)
Maximum zero fuel weight:	25,401 kg (56,000 lb)
Minimum flight weight:	23,224 kg (51,200 lb)
Minimum operating empty weight:	21,772 kg (48,000 lb)

Aircraft incorporating 40,687 kg (89,700 lb) MTOW placard

Maximum taxi and ramp weight:	40,801 kg (89,950 lb)
Maximum take-off weight:	40,687 kg (89,700 lb)
Maximum landing weight:	35,652 kg (78,600 lb)
Maximum zero fuel weight:	25,401 kg (56,000 lb)
Minimum flight weight:	23,224 kg (51,200 lb)
Minimum operating empty weight:	21,772 kg (48,000 lb)

NOTE

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

B. Buoyancy Limitations

(1) TAKE-OFF ON RUNWAYS NEAR BODIES OF WATER

- For take-off at weights above the maximum landing weight, OUTFLOW VLV 2 must be closed and one air-conditioning pack must be shutdown for take-off.

(2) LANDING ON RUNWAYS NEAR BODIES OF WATER

- For forced / emergency landing at weights above the maximum landing weight, OUTFLOW VLV 2 must be closed and one air-conditioning pack must be shutdown for landing.

LIMITATIONS
STRUCTURAL WEIGHT

THIS PAGE INTENTIONALLY LEFT BLANK

LIMITATIONS

CENTRE OF GRAVITY

1. CENTRE OF GRAVITY

A. Centre Of Gravity Limits

The maximum permissible centre of gravity (CG) limits are as shown in Figure 02-03-1.

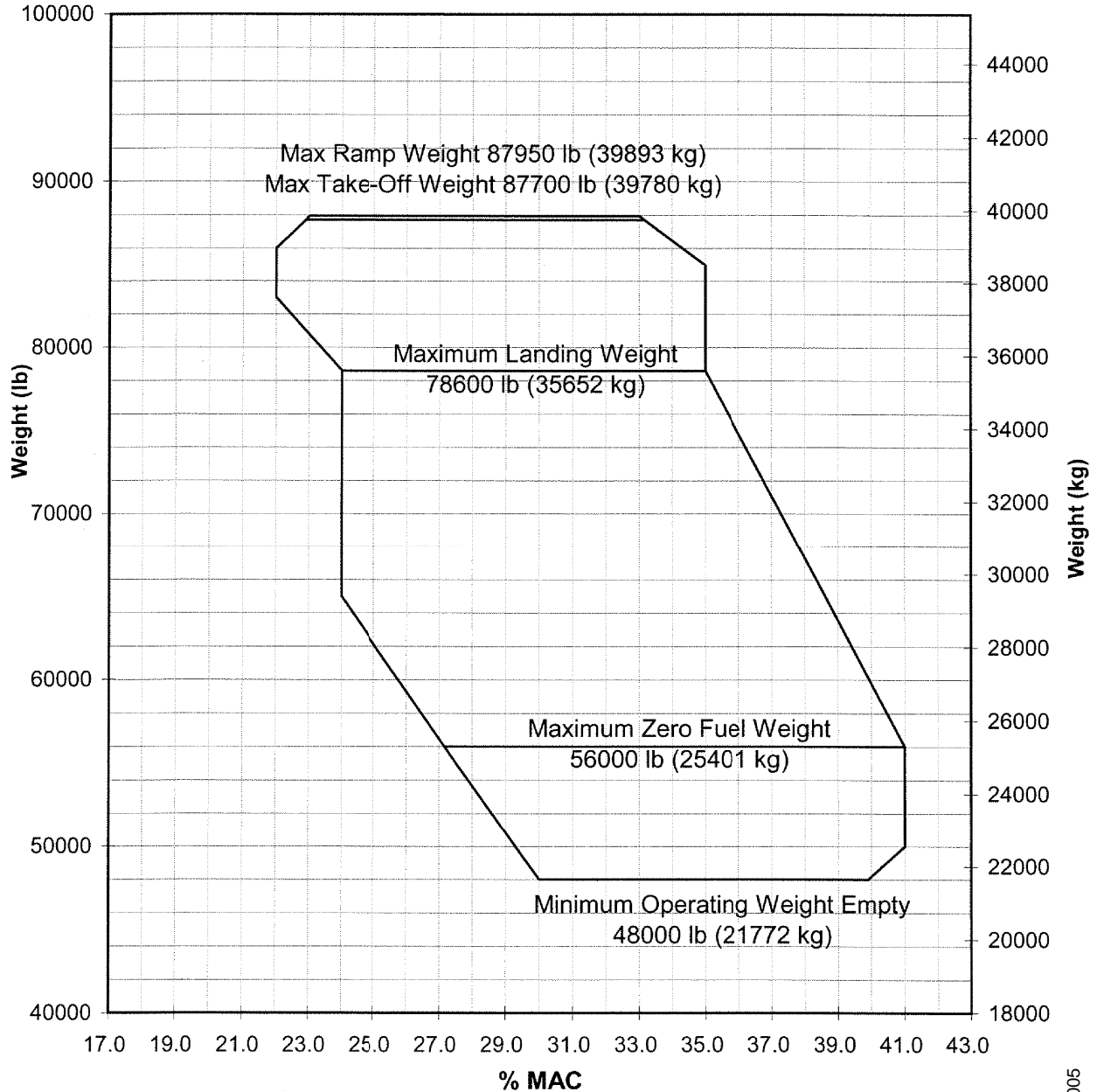
The airplane including interior payload, passengers and fuel must be loaded such that the airplane weight and centre of gravity are maintained within the specified limits (including any variation due to fuel consumption, passenger movement, retraction of landing gear, etc.).

The airplane must be loaded in accordance with the loading instructions associated with the Weight and Balance Manual (BD 700-1A11-WBM).

LIMITATIONS CENTRE OF GRAVITY

1. CENTRE OF GRAVITY (CONT'D)

A. Centre Of Gravity Limits (Cont'd)



GF0203_005

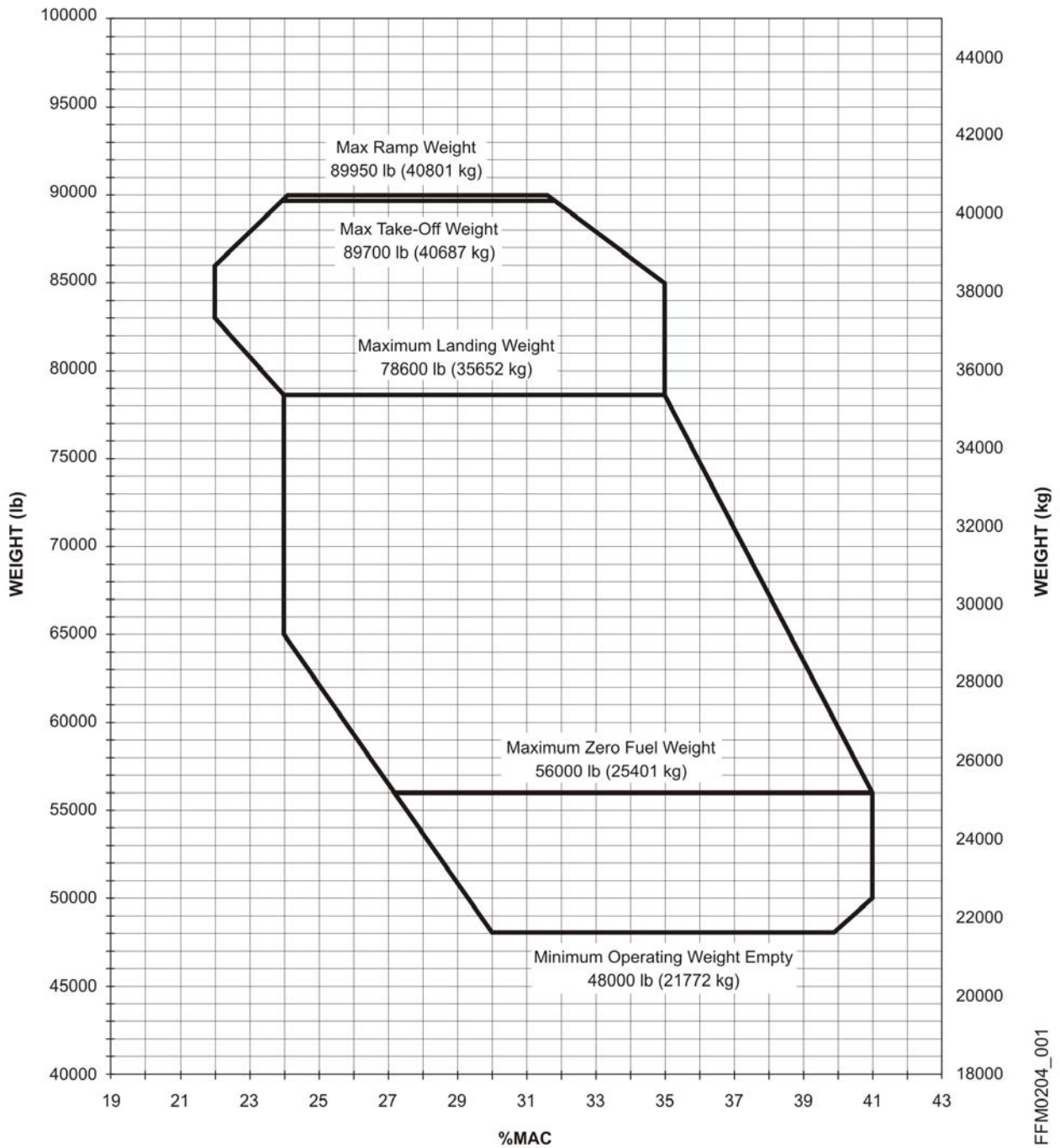
Centre of Gravity (CG) Envelope
Figure 02-03-1

LIMITATIONS CENTRE OF GRAVITY

1. CENTRE OF GRAVITY (CONT'D)

A. Centre Of Gravity Limits (Cont'd)

Aircraft incorporating 40,687 kg (89,700 lb) MTOW placard



Centre of Gravity (CG) Envelope
Figure 02-03-1

LIMITATIONS
CENTRE OF GRAVITY

THIS PAGE INTENTIONALLY LEFT BLANK

LIMITATIONS

OPERATING LIMITATIONS

1. OPERATING LIMITATIONS

A. Altitude and Temperature Operating Limit

The altitude and temperature operating limit is as shown in Figure 02-04-1.

Maximum airport pressure altitude for take-off and landing is 10,000 feet.

Maximum operating altitude is 51,000 feet.

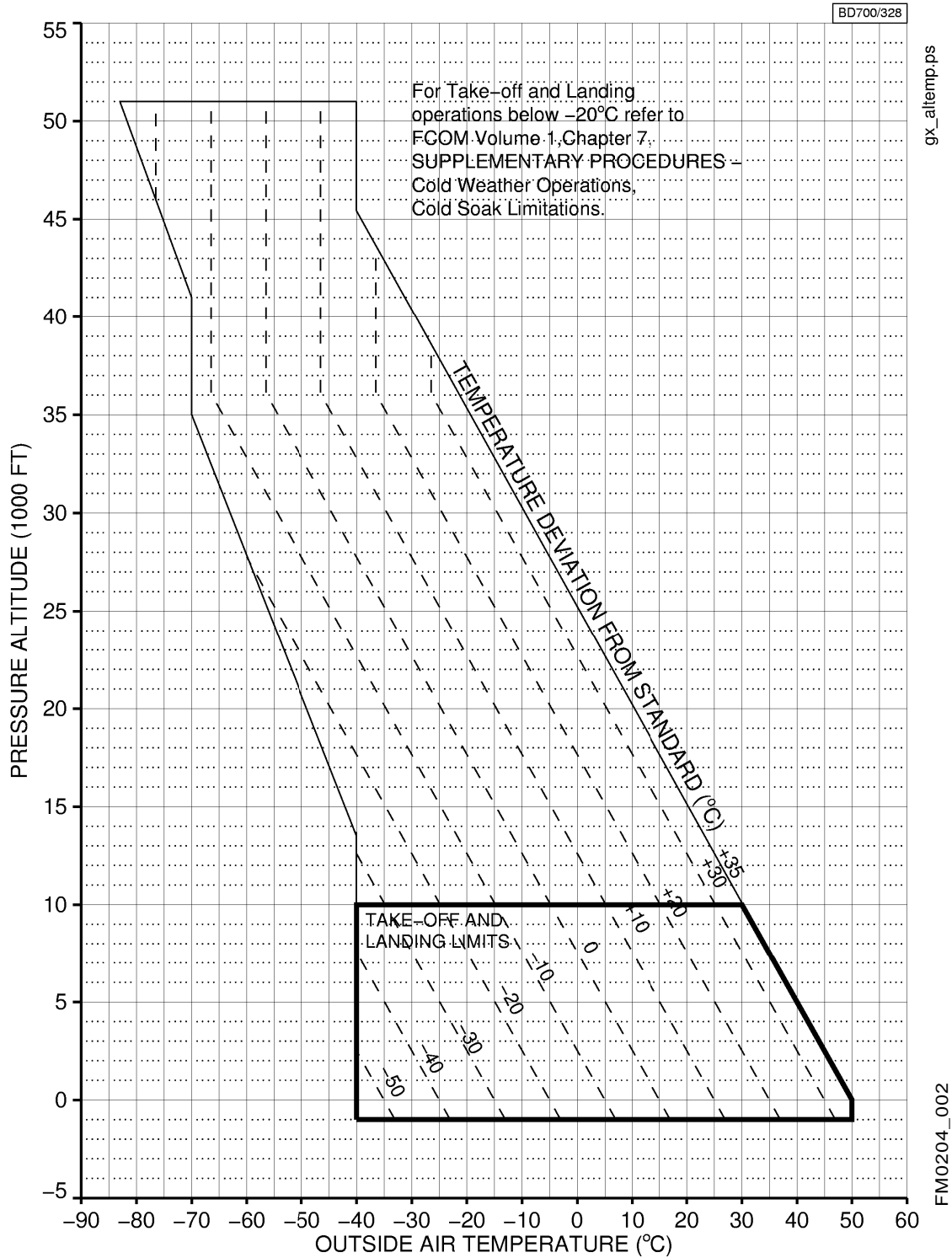
Maximum ambient air temperature approved for take-off and landing is +50 °C (122 °F).

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

LIMITATIONS OPERATING LIMITATIONS

1. OPERATING LIMITATIONS (CONT'D)

A. Altitude and Temperature Operating Limit (Cont'd)



FM0204_002

Altitude and Temperature Operating Limit
Figure 02-04-1

LIMITATIONS OPERATING LIMITATIONS

1. OPERATING LIMITATIONS (CONT'D)

B. Operation in Icing Conditions

(1) COWL ANTI-ICE SYSTEM

Ground Operations:

- During take-off, use of cowl anti-ice in AUTO mode is prohibited.
- 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 a visibility of 1,500 meters (one mile) or less, rain, snow and ice crystals].
- The cowl anti-ice 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 engine cowl anti-ice system must be ON, when in icing conditions, or when ICE is annunciated by the ice detection system.

(2) WING ANTI-ICE SYSTEM

Ground Operations:

- During take-off, use of the wing anti-ice system in AUTO is prohibited.
- 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 SAE Type II, Type 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 in icing conditions, or when ICE is annunciated by the ice detection system.
- Do not hold in icing conditions with the slats extended.
- When in icing conditions, maintain a minimum engine speed of 76% N₂.

LIMITATIONS

OPERATING LIMITATIONS

1. OPERATING LIMITATIONS (CONT'D)

C. Runway Slopes

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

+2% (uphill)

-2% (downhill)

D. Tailwind Conditions

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

E. Minimum Flight Crew

The minimum flight crew is one pilot and one copilot.

F. Maximum Occupants

The total number of occupants, including no more than nineteen (19) passengers, must not exceed the lesser of the following:

- Twenty two (22), or
- The number for which seating accommodation approved for take-off and landing is provided.

G. Cold Weather Operations

Airplane operation in cold weather conditions is to be conducted in accordance with Flight Crew Operating Manual, Volume 1, Chapter 7, SUPPLEMENTARY PROCEDURES – Cold Weather Operations. The minimum ambient temperature approved for take-off is -40 °C (-40 °F).

Take-off is prohibited with frost, ice, snow or slush adhering to any critical surface (wings, horizontal stabilizer, vertical stabilizer, control surfaces, engine inlets and upper surface of the fuselage).

WARNING

Even small amounts of frost, ice, snow or slush on the wing leading edges and forward upper wing surface may adversely change the stall speeds, stall characteristics and the protection provided by the stall protection system, which may result in loss of control on take off.

NOTE

1. Comprehensive procedures for operating in cold weather are provided in Flight Crew Operating Manual, Volume 1, Chapter 7; SUPPLEMENTARY PROCEDURES – Cold Weather Operations.
2. Take-off is permitted with frost adhering to the underside of the wing that is caused by cold soaked fuel, in accordance with the instructions provided in Flight Crew Operating Manual, Volume 1, Chapter 7; SUPPLEMENTARY PROCEDURES – Cold Weather Operations – Pre-flight Preparation, External Safety Inspection.

LIMITATIONS

OPERATING LIMITATIONS

1. OPERATING LIMITATIONS (CONT'D)

H. Runway Surface Condition

Operations from unprepared (i.e. gravel, grass, etc.) runways are prohibited.

I. Minimum Enroute Climb Gradient and Clearance

It is recommended that the minimum enroute net climb gradient with one engine inoperative is positive and all terrain and/or obstacles be cleared by at least 1,300 feet along the enroute flight path.

LIMITATIONS
OPERATING LIMITATIONS

THIS PAGE INTENTIONALLY LEFT BLANK

LIMITATIONS POWER PLANT

1. ENGINE OPERATING LIMITS

A. Type

BR700–710A2–20, quantity two.

B. Engine Operating Limits Table

CONDITION	CORE RPM N ₂ %	FAN RPM N ₁ %	ITT°C
Start	N/A	N/A	700 (on ground) 850 (in flight)
Idle	58.0 (minimum)	N/A	860
Take-Off *	99.6	102.0	900 *
Max Continuous	98.9	102.0	860
–	99.8 (20 seconds)	102.5 (20 seconds)	905 (20 seconds)
Reverse Thrust	–	70.0 (30 seconds)	–
* Take-off thrust for 5 minutes with all engines operating. Take-off thrust for 10 minutes in the event of an engine failure.			

NOTE

Static ground operation in the range of 66% to 80% N₁ is prohibited. Acceleration/deceleration thru this range is permitted. This limitation does not apply to reverse thrust.

C. Cold Weather Operations

Airplane operations in cold weather conditions must be conducted in accordance with Chapter 7; SUPPLEMENTARY PROCEDURES – Cold Weather Operations.

D. Thrust Management Data

Thrust management information is advisory only. Thrust setting data presented on EICAS / FMS must be checked for accuracy prior to use. Refer to Airplane Flight Manual, Chapter 6; PERFORMANCE – THRUST SETTINGS.

E. Maximum Wind Speed and Direction

Engine starts are not permitted when the tailwind component exceeds 20 knots. Anytime there is an external or EICAS indication of N₁ rotation due to tailwinds, the engine must be cranked for 30 seconds and must be followed immediately by an AUTO start.

When winds exceed 20 knots, do not exceed the minimum thrust required for taxi. When the take-off crosswind component exceeds 20 knots, do not exceed 66% N₁ below 30 KIAS. There are no limits for a headwind within 10 degrees of the airplane centreline.

Refer to Chapter 4; NORMAL PROCEDURES – TAXIING AND TAKE-OFF – HIGH CROSSWIND TAKE-OFF.

LIMITATIONS POWER PLANT

2. STARTER CRANKING LIMITS (GROUND AND AIR)

A. General

The starter must not be used if indicated RPM exceeds 42% N₂.

B. Engine Start

Normal engine start – 3 consecutive engine start cycles of 3 minutes each with 15 seconds cooling between cycles.

After 3 attempts, a 15-minute cooling period is required.

C. Dry Motoring / Cranking Cycle

Dry motoring / cranking time limits are as given in para 2.B., Engine Start.

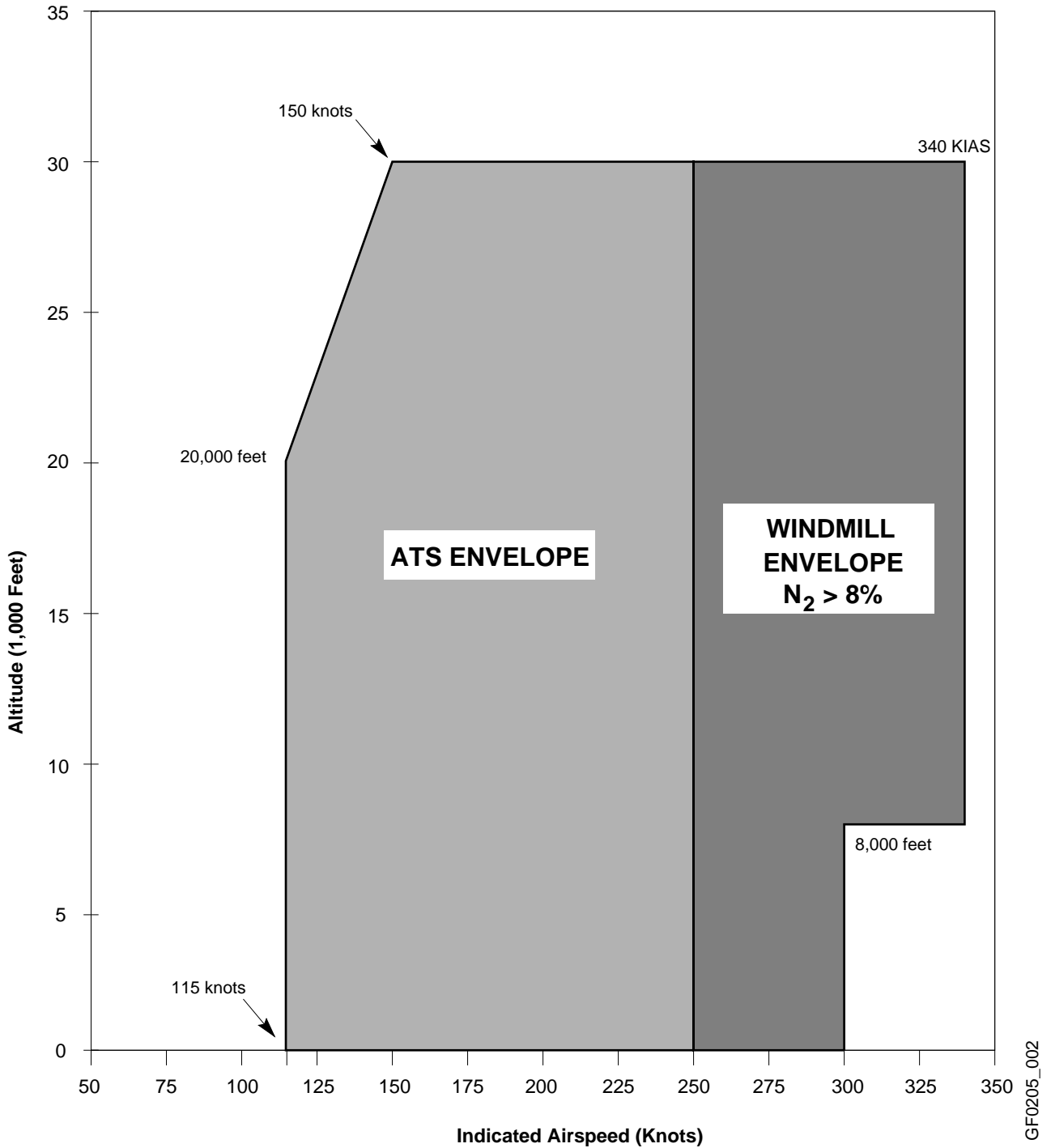
Dry motoring / cranking is performed with the ENGINE RUN switches OFF.

LIMITATIONS POWER PLANT

2. STARTER CRANKING LIMITS (GROUND AND AIR) (CONT'D)

D. Engine Air Start Envelope

See Figure 02-05-1.



Engine Air Start Envelope
Figure 02-05-1

LIMITATIONS POWER PLANT

3. FUEL

A. Fuel Imbalance

The maximum permissible fuel imbalance between the contents of the main left tank and the main right tank is as follows:

WING TANK FUEL LOAD	ON GROUND AND DURING TAKE-OFF AND LANDING	DURING FLIGHT
Less than 8823 kg (19,450 lb)	488 kg (1100 lb)	488 kg (1100 lb)
From 8823 kg (19,450 lb) to 9186 kg (20,250 lb)	488 kg (1100 lb) to 266 kg (600 lb)	488 kg (1100 lb)
Greater than 9186 kg (20,250 lb)	266 kg (600 lb)	488 kg (1100 lb)

B. Usable Fuel Load

The maximum usable fuel load for each fuel tank is given below:

PRESSURE REFUEL (+0 / -1% WING TANKS, +0 / -3% CENTER TANK)				
	TANK VOLUME		FUEL MASS †	
Left main tank	8,435 litres	2,229 USG	6,825 kg	15,050 lb
Right main tank	8,435 litres	2,229 USG	6,825 kg	15,050 lb
Centre tank	3,418 litres	903 USG	2,775 kg	6,100 lb
Total	20,288 litres	5,361 USG	16,425 kg	36,200 lb

† based on a fuel density of 0.809 kg / litre (6.75 lb / USG), rounded to the nearest 25 Kg or 50 lb. Fuel Mass is provided for reference only and should not be considered limiting.

GRAVITY REFUEL (AIRPLANE LEVEL)				
	TANK VOLUME		FUEL MASS †	
Left main tank	7,760 litres	2,050 USG	6,275 kg	13,850 lb
Right main tank	7,760 litres	2,050 USG	6,275 kg	13,850 lb
Centre tank	3,142 litres	830 USG	2,550 kg	5,600 lb
Total	18,662 litres	4,930 USG	15,100 kg	33,300 lb

† based on a fuel density of 0.809 kg / litre (6.75 lb / USG), rounded to the nearest 25 Kg or 50 lb. Fuel Mass is provided for reference only and should not be considered limiting.

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

C. Fuel Distribution

Fuel in the centre tank must be considered unusable unless each wing tank is full at departure, and the planned cruise altitude is greater than 30,000 feet.

If use of the centre tank is planned, the tank fuel load is to be no less than 230 kg (500 lb) to ensure transfer pumps reprime.

LIMITATIONS POWER PLANT

3. FUEL (CONT'D)

D. Minimum Fuel Quantity for Go-around

The minimum fuel quantity for go-around is 266 kg (600 lb) per wing (with wings level) and assuming a maximum airplane climb attitude of 10° nose up.

E. Fuels and Fuel Additives

When using wide cut or CIS fuels, operation is limited to 13,000 feet until the bulk fuel temperature is below 15 °C.

Mixing of fuels is permitted.

Take-off with bulk fuel temperature indications outside the limits stated is prohibited.

During flight, bulk fuel temperature must remain above the applicable bulk fuel freezing point.

Fuels conforming to any of the following specifications are approved for use.

(1) CANADIAN FUELS

FUEL SPEC		BULK FUEL TAKE-OFF LIMIT		BULK FUEL FREEZING POINT
		MIN °C	MAX °C	
Kerosene	CAN 2 – 3.23	-30 °C	54 °C	-40 °C
	CAN 2 – 3.23	-37 °C	54 °C	-47 °C
Wide-Cut	CAN 2 – 3.22	-40 °C	43 °C	-50 °C
	CAN 2 – 3.22	-48 °C	43 °C	-58 °C

(2) AMERICAN FUELS

FUEL SPEC		BULK FUEL TAKE-OFF LIMIT		BULK FUEL FREEZING POINT
		MIN °C	MAX °C	
Kerosene	ASTM D1655 – JET A	-30 °C	54 °C	-40 °C
	ASTM D1655 – JET A1	-37 °C	54 °C	-47 °C
	MIL-T-83133 – JP-8	-37 °C	54 °C	-47 °C
	MIL-T-5624 – JP-5	-36 °C	54 °C	-46 °C
Wide-Cut	ASTM D1655 – JET B	-40 °C	43 °C	-50 °C
	ASTM D1655 – JP-4	-48 °C	43 °C	-58 °C

LIMITATIONS POWER PLANT

3. FUEL (CONT'D)

E. Fuels and Fuel Additives (Cont'd)

(3) BRITISH FUELS

FUEL SPEC		BULK FUEL TAKE-OFF LIMIT		BULK FUEL FREEZING POINT
		MIN °C	MAX °C	
Kerosene	D. ENG. RD. 2494	-30 °C	54 °C	-40 °C
	D. ENG. RD. 2494	-37 °C	54 °C	-47 °C
	D. ENG. RD. 2453	-37 °C	54 °C	-47 °C
	D. ENG. RD. 2452	-36 °C	54 °C	-46 °C
Wide-Cut	D. ENG. RD. 2486	-40 °C	43 °C	-50 °C
	D. ENG. RD. 2486	-48 °C	43 °C	-58 °C

(4) CIS FUELS

FUEL SPEC		BULK FUEL TAKE-OFF LIMIT		BULK FUEL FREEZING POINT
		MIN °C	MAX °C	
Wide-Cut	TS-1 Premium	-40 °C	43 °C	-50 °C
	RT Premium	-45 °C	43 °C	-55 °C

(5) CHINESE FUELS

FUEL SPEC		BULK FUEL TAKE-OFF LIMIT		BULK FUEL FREEZING POINT
		MIN °C	MAX °C	
Chinese				
Kerosene	GB 6537-94 No.3	-37 °C	54 °C	-47 °C

(6) FUEL ADDITIVES

- 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.
- Russian fuel icing inhibitors Fluid I (conforming to GOST 8313) at a maximum concentration of 0.3% vol. and Fluid I-M (conforming to TU6-10-1458 GOST, a mixture of GOST 8313 and GOST 2222 in equal parts by weight) at a maximum concentration 0.3% vol.
- 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.
- Stadis 450 anti-static additive at a concentration of 5 mg/L.

LIMITATIONS POWER PLANT

3. FUEL (CONT'D)

F. Engine Fuel Temperature

Take-off with engine fuel temperature indications below 5 °C is prohibited.

G. Fuel Crossfeed

Fuel crossfeed must be off for take-off and landing.

H. Fuel Recirculation System

Fuel Recirculation must be inhibited when using wide cut or CIS fuels.

Asymmetric operation of Fuel Recirculation is prohibited during normal operation.

4. OIL

A. Oil Temperature

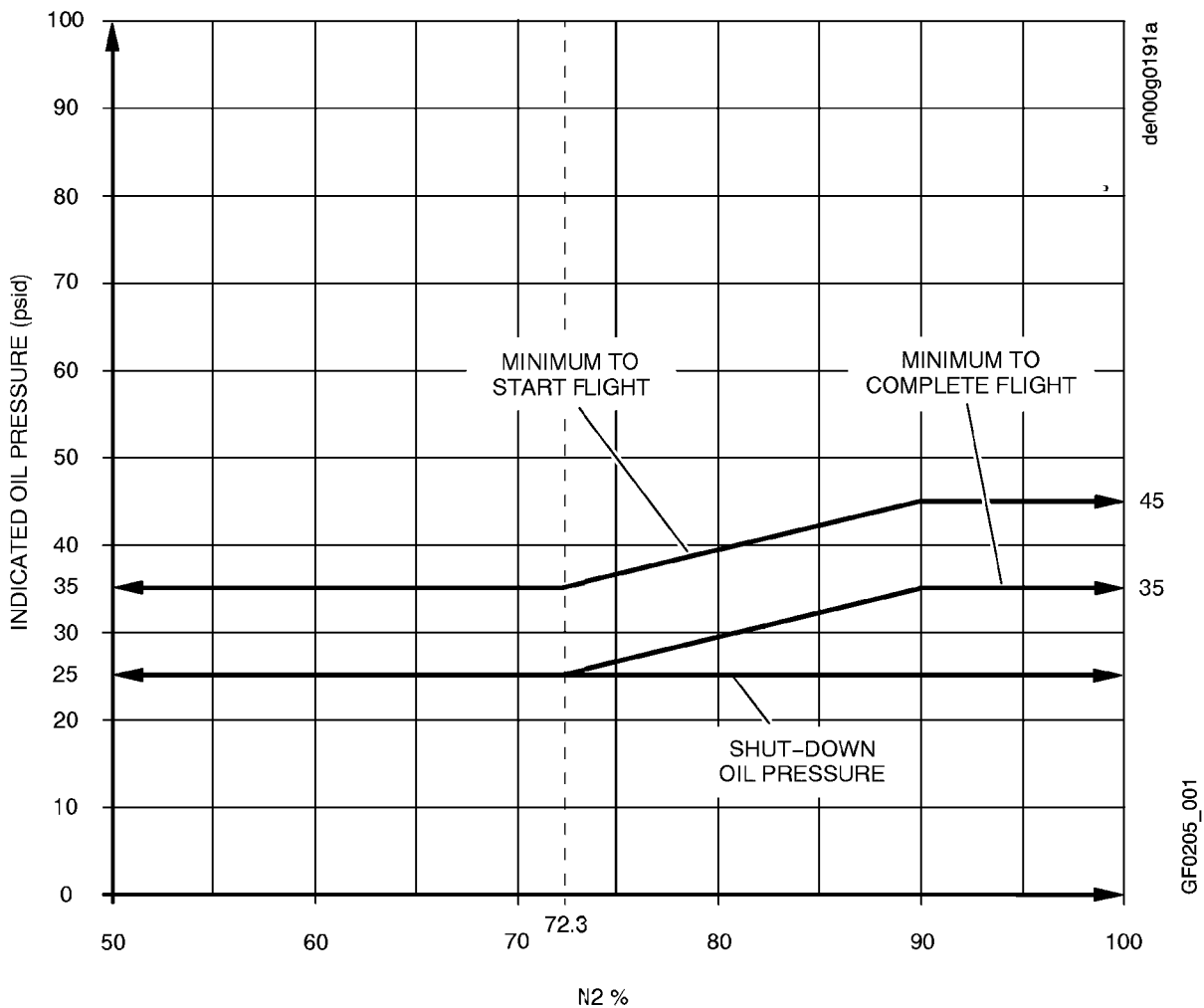
Minimum for starting	-40°C
Minimum before accelerating above idle	+20°C
Maximum Permissible	+160°C

LIMITATIONS POWER PLANT

4. OIL (CONT'D)

B. Oil Pressure

See Figure 02-05-2.



Engine Oil Pressure Limits
Figure 02-05-2

C. Oil Grades

The Airplane Maintenance Manual, Chapter 51, lists the oils approved for use.

D. Oil Consumption

Maximum oil consumption, on each engine, is 0.2 litre per hour (0.21 US quarts per hour).

E. Oil Replenishment

Operation of the oil replenishment system is prohibited when the OAT ≤ -12 °C.

5. AUTOTHROTTLE

A. Take-Off

The autothrottle must be engaged and take-off thrust verified prior to 60 KIAS for autothrottle engaged take-off.

B. Landing

Use of the auto-throttle when landing with flaps at any position other than flaps 30° is prohibited.

6. AUXILIARY POWER UNIT

A. Type: RE 220

B. Maximum RPM: 106%

C. Maximum EGT (dependent upon altitude and OAT) :

- During start: 675 °C to 1038 °C.
- Normal operations: 613 °C to 732 °C.

D. Maximum Operating Altitude: 45,000 feet

E. Starting:

- (1) Minimum ambient temperature for starting a cold soaked APU on the ground is -40 °C.
- (2) The maximum number of start attempts per hour is three.
- (3) Maximum Starting Altitude – 37,000 feet.
- (4) Temperature – See Figure 02-04-1.

F. Bleed Air Extraction Limit:

- (1) Bleed air extraction is limited to 30,000 feet.
- (2) APU bleed extraction above 45 °C OAT for air-conditioning operation is prohibited.

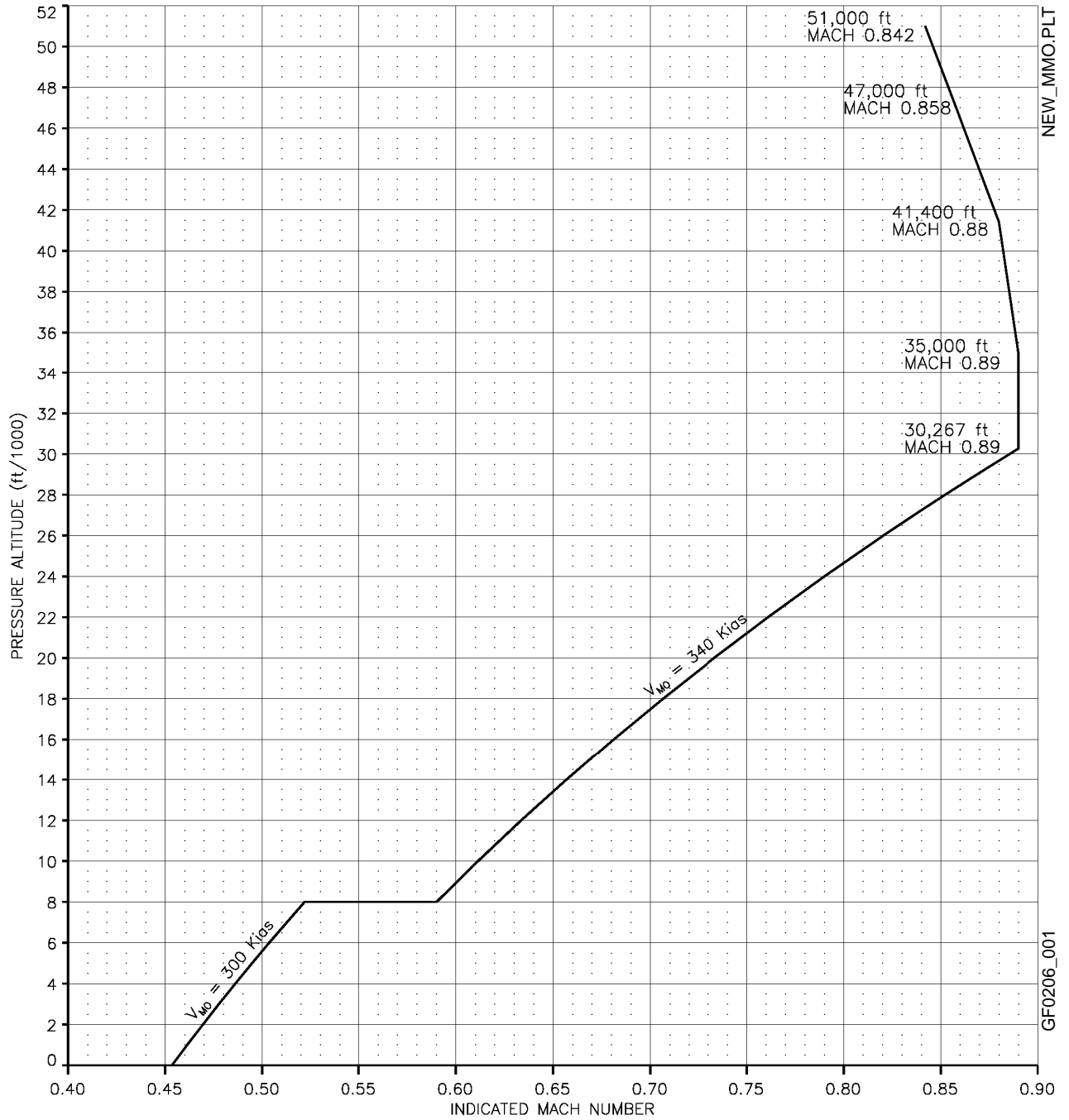
THIS PAGE INTENTIONALLY LEFT BLANK

LIMITATIONS OPERATING SPEEDS

1. OPERATING SPEEDS

A. Maximum Operating Speed and Mach Number

Maximum operating limit speeds as given in Figure 02-06-1.



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

LIMITATIONS OPERATING SPEEDS

1. OPERATING SPEEDS (CONT'D)

B. Design Maneuvering Speed



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 .

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 .

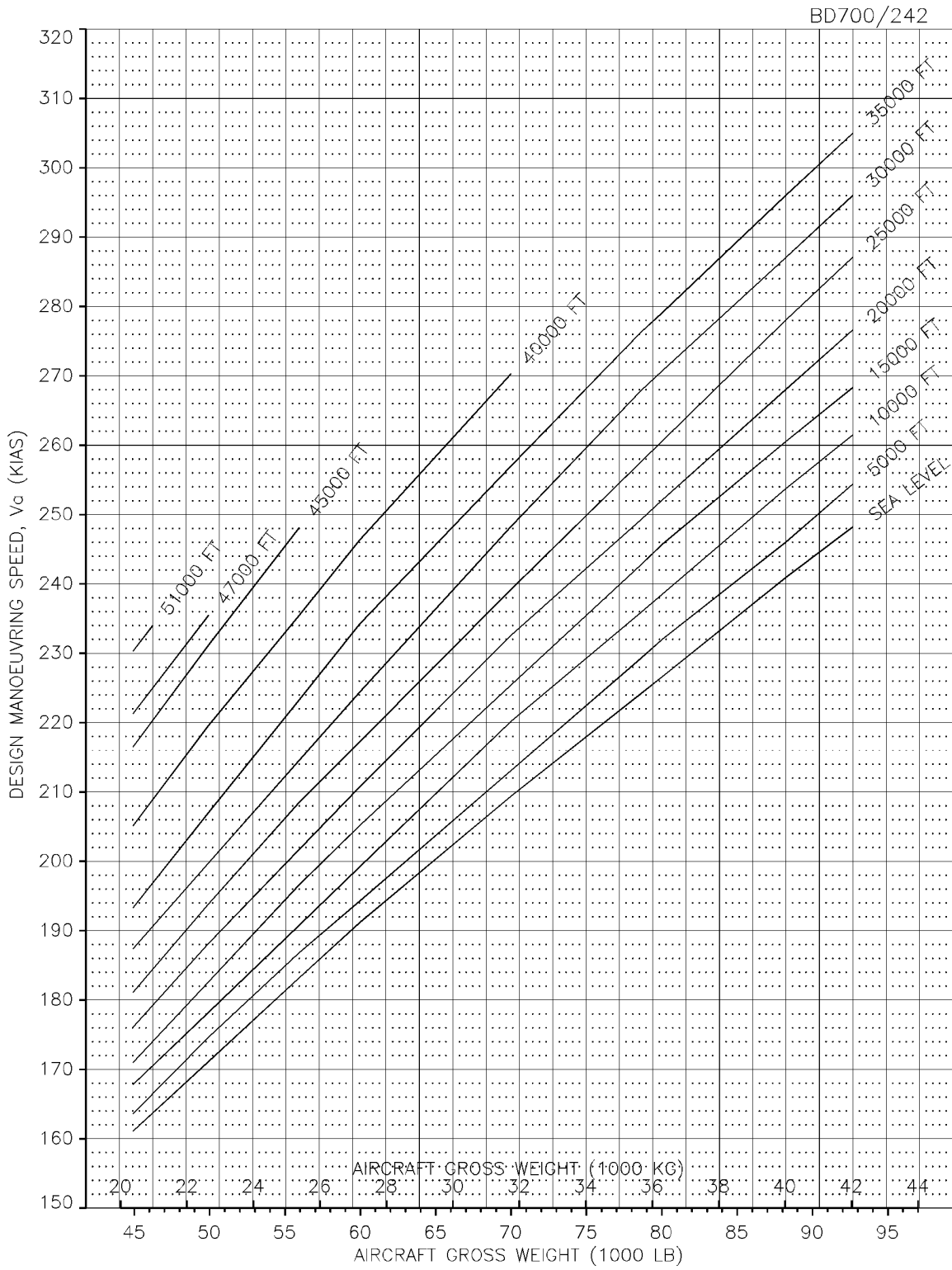
Values of V_A are given in Figure 02-06-2, for varying pressure altitudes and airplane weights.

NOTE: For 51,000 feet, the maneuvering 'g' was reduced to 2.3 'g' due to stall limitations.

LIMITATIONS OPERATING SPEEDS

1. OPERATING SPEEDS (CONT'D)

B. Design Maneuvering Speed (Cont'd)



G5000_MANVR_SPD_2005_01_25

FFM0206_001

Design Maneuvering Speeds
Figure 02-06-2

LIMITATIONS OPERATING SPEEDS

1. OPERATING SPEEDS (CONT'D)

C. Slat/Flap Extended Speed

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

- Slats extended: 225 KIAS
- Flaps to 6 degrees: 210 KIAS
- Flaps to 16 degrees: 210 KIAS
- Flaps to 30 degrees: 185 KIAS

D. Maximum Landing Gear Operating Speed

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

E. Maximum Landing Gear Extended Speed

The maximum airspeed at which the airplane may be flown with the landing gear extended is 250 KIAS / 0.7 M.

Flight at altitudes above 20,000 feet with the landing gear extended is prohibited.

F. Tire Limit Speed

The tire limit speed is 183 knots ground speed.

G. Turbulence Penetration Speed

Maximum air speed for turbulence penetration is 300 KIAS or .80 Mach, whichever is lower.

NOTE

Turbulence penetration maneuvers must be accomplished in accordance with the procedures detailed in Chapter 7; SUPPLEMENTARY PROCEDURES – FLIGHT IN TURBULENCE.

H. Minimum Operating Limit Speed

Intentional speed reduction below the onset of stall warning, as defined by stick shaker operation, is prohibited.

V_{MCG} is 80 KIAS and V_{MCA} in the take-off configuration is 86 KIAS.

LIMITATIONS MANEUVERING LOADS

1. MANEUVERING LOADS

A. 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:

- Slats / flaps retracted: -1.0 G to +2.5 G.
- Slats / flaps extended: 0.0 G to +2.0 G.

LIMITATIONS
MANEUVERING LOADS

THIS PAGE INTENTIONALLY LEFT BLANK

1. SYSTEMS

A. Air-Conditioning and Pressurization

- Pack discharge temperatures during manual mode temperature control operations must be kept between 5 °C and 60 °C.
- One pack must be selected off if pack control is in manual mode.
- The maximum relief differential pressure is 10.73 psi.

Effectivity:

- *Airplanes 9127 thru 9158 **not incorporating** Service Bulletin:*
 - *SB 700-1A11-21-004, Modification – Pressurization Control – Cabin Altitude Reduction During Flight for Improved Passenger Comfort.*

The maximum relief differential pressure is 10.02 psi.

- The maximum negative relief differential pressure is -0.5 psi.
- During taxi and take-off, the pressure differential must not exceed 0.1 psi.
- During initial landing (at touchdown), the pressure differential must not exceed 1.0 psi.
- Auxiliary pressurization (AUX PRESS) system operations are prohibited at altitudes greater than 41,000 feet.
- APU bleed extraction above 45 °C OAT for air-conditioning operation is prohibited.
- Use of the EMER DEPRESS switch above 15,000 feet is prohibited.

B. Automatic Flight Control System

- Maximum altitude for flight with the yaw damper disengaged is 41,000 feet.
- The minimum autopilot engage height is 400 feet AGL.
- The minimum autopilot use height is:
 - For a precision approach (Category I or II ILS) is 50 feet AGL, and
 - For a non-precision approach is 400 feet AGL.

JAA Certified Airplanes

- The minimum autopilot use height is:
 - For a precision approach (Category I or II ILS) is 80 feet AGL, and
 - For a non-precision approach is 400 feet AGL.

- Use of the NAV guidance panel switch for approaches with VOR as a NAV source is prohibited.
- Use of FLC mode with the speed bug above 0.85 Mach is prohibited.

NOTE

Large wind gradients, such as climbing or descending thru the jet stream, may cause undesirable pitch and/or speed changes in FLC. If this occurs it is recommended that another vertical mode (PIT, VS) be selected.

1. SYSTEMS (CONT'D)

B. Automatic Flight Control System (Cont'd)

Effectivity:

- Airplanes 9127 thru 9153 **not incorporating** Service Bulletin:
 - SB 700-1A11-31-002, Integrated Avionics Computers (IAC) – Batch 2 IAC Upgrade.

Use of FLC mode with the speed bug in the MACH mode is prohibited.

C. APU Generator

- The load limit on the APU generator is 40 kVA.
- For operations above 37,000 feet, if the APU generator is powering a bus, the associated hydraulic pump must be selected off (1B – AC BUS 3; 2B – AC BUS 2; 3A – AC BUS 4; 3B – AC BUS 1).

D. Flight Spoilers

- Flight Spoilers must be retracted below 300 feet AGL.

E. Stall Protection System

- Both stall protection pusher switches must remain on for the duration of the flight.

F. Thrust Reversers

- Thrust reversers must not be selected in flight. Positioning of thrust levers in the reverser range while in flight is prohibited.
- The thrust reversers are intended for use during full stop landings. Touch-and-go maneuvers after deployment of the thrust reversers is prohibited.
- Backing the airplane with the use of reverse thrust is prohibited.

G. Wheel Brake Cooling Limitations

Brake and tire cooling times (established in accordance with Chapter 6; 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.

H. 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.

Maneuvers must not be based solely on information presented on the MFD traffic display.

JAA Certified Airplanes

The use of TCAS must comply with the appropriate national operational regulations.

I. Flight Controls – Flaps

Flight with slats / flaps extended at altitudes above 18,000 feet is prohibited.

1. SYSTEMS (CONT'D)

J. Configuration Deviation List

If the airplane 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 Airplane Flight Manual, CONFIGURATION DEVIATION LIST (APPENDIX 1).

K. Nose Wheel Steering System

- Towbarless towing is prohibited, unless the operation is performed in compliance with the Airplane Maintenance Manual towbarless towing requirements.

L. Enhanced Ground Proximity Warning System (EGPWS)

(1) SYSTEM LIMITATIONS

- The system must be operated in accordance with the latest edition of the Airplane Flight Manual and the Honeywell (formerly Allied Signal) Enhanced Ground Proximity Warning System Pilot's Guide P/N 060-4241-0000 REV D or latest approved edition.
- During QFE operations with no GPS sensors available, the terrain awareness alerting and display system must be inhibited by selecting the EGPWS TERRAIN switch to OFF when the barometric altitude is corrected to the landing field elevation.
- The TERR switch must be selected OFF when within 15 Nm of an intended take-off or landing airport not contained in the EGPWS database.
- 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.

(2) TERRAIN AVOIDANCE MANEUVERING

- 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 Warning 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.

M. RAT Generator test

A RAT generator test must be accomplished in accordance with Chapter 4, NORMAL PROCEDURES – AIRPLANE PREPARATION – Flight Compartment Originating Check – RAT Generator Test.

THIS PAGE INTENTIONALLY LEFT BLANK

LIMITATIONS NAVIGATION SYSTEMS

1. NAVIGATION SYSTEMS

A. Flight Management System

- The flight management system (FMS) must be operated in accordance with the latest edition of the following:
 - (1) Airplane Flight Manual, and
 - (2) Honeywell Flight Management System FMZ Pilot's Operating Manual for the CD-820, publication number A28-1146-149-00, dated May 2000 or latest applicable revision, and
 - (3) Honeywell Flight Management System FMZ Pilot's Operating Manual, publication number A28-1146-185-00, dated June 2004 or latest applicable revision.
- The FMS is approved for use with software program version NZ5.8 as displayed on the FMS CDU "NAV IDENT" page 1/1.

Effectivity:

- *Airplanes 9127 thru 9174 not incorporating Service Bulletin:*
 - *SB 700-1A11-31-007, Integrated Avionics Computer (IAC) System – Batch 2+ IAC Upgrade.*
- Use of the FMS TOLD function is prohibited.

- If a difference exists between the AFM and the Honeywell FMS Pilot's Operating Manual, the AFM shall take precedence.
- Use of the FMS database for IFR is prohibited unless the database is current or the pilot verifies waypoints for accuracy by reference to current publications.
- The FMS must not be used as a navigation source unless it is receiving suitable navigation information from the following:
 - One VOR /DME, or
 - Two DMEs, or
 - One inertial reference system.
- The flight plans on the paired FMSs must be identical when conducting FMS approaches.
- Instrument approaches must be accomplished only in accordance with instrument approach procedures that are contained in the FMS database. The database must incorporate the current update cycle. The pilot must verify approach waypoints for accuracy by reference to current publications.
- Use of FMS as a sole NAV source for instrument approaches past the Final Approach Fix is prohibited unless APP is annunciated on the PFD.
- Fuel display parameters are advisory only, and must not be used to replace primary fuel quantity or fuel flow indications for fuel load and range planning.
- The aircraft must have other approved navigation equipment, appropriate to the route, installed and operating.
- Use of FMS as the PFD NAV SRC for ILS, LOC, LOC-BC, LDA, SDF and MLS approaches beyond the Final Approach Fix is prohibited.
- Capture and tracking of DME arcs outside of the published end points of an approved IFR procedure is prohibited.

LIMITATIONS
NAVIGATION SYSTEMS

1. NAVIGATION SYSTEMS (CONT'D)

A. Flight Management System (Cont'd)

- The GPS sensor(s) must be deselected when on approach in airspace not referenced to WGS-84 or NAD-83.
- GPS updating is not approved when other navigation sensors are deselected, inoperative or in any other way not providing accurate navigation data to the FMS.
- Before compliance with any ATC clearance or instruction which is displayed by the datalink, the ATC clearance or instruction must be independently verified with the originating ground station.
- The FMS has been demonstrated capable of and has been shown to meet the requirements of the following:
 - North Atlantic Tracks (NAT) Minimum Navigational Performance Standards (MNPS) Airspace
 - Providing two FMS installations are operating with each receiving information from at least two inertial reference systems, the FMS has been demonstrated capable of flight into NAT MNPS airspace and has been shown to meet the accuracy specification in accordance with AC 120-33 or AC 91-49.
 - GPS Enroute, Terminal and Approach Navigation
 - Use of the FMS with the GPS is approved for supplemental means of navigation source for enroute and terminal operations. GPS-only approaches are approved.
 - Precision RNAV
 - 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.
 - When in Precision RNAV Operations, Pilot is to monitor lateral deviation indicator on MFD. The maximum value of lateral deviation permitted on the digital deviation display on the MFD in MAP mode is +/- 0.5 nm cross track error.
 - GPS is required for takeoff in Precision RNAV airspace.
 - If equipped with Laseref III, Precision RNAV operations with only IRS position for more than seven (7) minutes is prohibited.
 - If equipped with Laseref IV, Precision RNAV operations with only IRS position for more than twenty (20) minutes is prohibited.
 - Compliance with AC 90-100 U.S. Terminal and Enroute Area Navigation (RNAV) Operations
 - When equipped with an operating FMS and GPS, the aircraft meets the functional +/- 1.0 nm accuracy requirements of AC 90-100 U.S. Terminal and Enroute RNAV Operations.
 - When in U.S. Terminal and Enroute RNAV Operations, Pilot is to monitor lateral deviation indicator on MFD. The maximum value of lateral deviation permitted on the digital deviation display on the MFD in MAP mode is +/- 0.5 nm cross track error.

LIMITATIONS
NAVIGATION SYSTEMS

1. NAVIGATION SYSTEMS (CONT'D)

A. Flight Management System (Cont'd)

- BRNAV / RNP-5
 - The FMS installation meets the requirements of RNP-5 in accordance with AC 90-96, Approval of US Operators and Aircraft to Operate under Instrument Flight Rules (IFR) in European Airspace Designated for Basic Area Navigation (BRNAV / RNP-5) and JAA Temporary Guidance Leaflet No. 2, rev. 1, AMJ 20X2, JAA Guidance Material on Airworthiness Approval and Operational Criteria for the use of Navigation Systems in European Airspace Designated for Basic RNAV Operations. In addition, the FMS installation has received airworthiness approval in accordance with Advisory Circular AC 20-130A.
- RNP 10
 - The FMS installation with the IRS has been demonstrated to meet the criteria of FAA Order 8400.12A "Required Navigation Performance 10 (RNP-10) Operational Approval" as a primary means of navigation for flight up to 6.2 hours in duration without updating. The determination of flight duration starts when the system is placed in the navigation mode.
 - The FMS with the GPS with RAIM has been demonstrated to meet the criteria of FAA Order 8400.12A "Required Navigation Performance 10 (RNP-10) Operational Approval" as a means of navigation for flights without time limitations when a second GPS is installed.
- VNAV
 - The VNAV vertical guidance has been demonstrated capable of and has been shown to meet the accuracy requirements of VFR/IFR enroute, terminal and approach VNAV operations in accordance with the criteria of AC20-129.
 - The use of VNAV temperature compensation in the "HOT & COLD" mode is prohibited.
 - The VNAV temperature compensation is per Section 9.18.1 of Transport Canada Aeronautical Information Publication (AIP).
 - Use of VNAV vertical guidance is prohibited when the barometric altitude is corrected to the landing field elevation (QFE operation).
- The demonstration of performance with the above criteria does not constitute any required operational approval to conduct MNPS, terminal airspace PRNAV, U.S. RNAV Q-Routes, Type A and Type B RNAV SIDs and STARs, oceanic / remote and terminal airspace RNP-5 and RNP-10, or VNAV operations.

B. Standby Instrument

On airplanes 9158 and subsequent:

- Use of the integrated standby instrument localizer display for LOC BC approaches is prohibited.

LIMITATIONS NAVIGATION SYSTEMS

1. NAVIGATION SYSTEMS (CONT'D)

C. Mode S Transponder Systems for Enhanced Surveillance

Effectivity:

- Airplane 9169 and subsequent and airplanes **incorporating** Service Bulletin:
 - SB 700-1A11-34-014, Air Traffic Control (ATC) Transponder System – Mode S Transponder to Meet Eurocontrol Enhanced Surveillance Requirements..
- The installed Mode S system satisfies the data requirements of ICAO Doc 7030/4, Regional Supplementary Procedures for SSR Mode S Enhanced Surveillance in designated European airspace. The capacity to transmit data parameters is shown in column 2:

Parameter	Available
Magnetic Heading	Yes
Indicated Airspeed	Yes
Mach Number	Yes
Vertical Rate	Yes
Roll Angle	Yes
Track Angle Rate	Yes
True Track Angle	Yes
Groundspeed	Yes
Selected Altitude	Yes
Barometric Pressure Setting	Yes

LIMITATIONS ELECTRICAL MANAGEMENT SYSTEM

1. CIRCUIT BREAKERS FOR DISABLED SYSTEMS

A. Green Airplanes

- The following EMS CDU circuit breakers must be confirmed selected OUT/LOCKED for all phases of flight:

NOTE

All thermal circuit breakers will be displayed OUT on EMS CDU and all SSPC's be displayed LOCKED.

AIR-COND / PRESS SYSTEM Page 2			
GALLEY FAN	HUMIDIFIER		
AIR-COND / PRESS SYSTEM Page 5			
TOILET FAN	TRU BAY FAN	TRU BAY FAN CTL	
CAIMS SYSTEM Page 1			
CAIMS PMAT LAPTOP	CKPT PRINTER		
COMM SYSTEM Page 1			
AIRPHONE REPEATER <SB 7001A11-23-002>	AIRPHONE SYSTEM <SB 7001A11-23-002>		
COMM SYSTEM Page 2			
DATALINK <SB 7001A11-23-005>	BATT CABIN FEED		
COMM SYSTEM Page 4			
SATCOM ANT CTRL <SB 7001A11-23-003>	SATCOM DATA UNIT <SB 7001A11-23-003>	SATCOM FREQ UNIT <SB 7001A11-23-003>	SATCOM AMP <SB 7001A11-23-003>
SATCOM HPA FAN <SB 7001A11-23-003>			
COMM SYSTEM Page 5			
VHF COMM 3 <SB 7001A11-23-004>			
ELEC SYSTEM Page 1			
AC 1 CABIN FEED	AC 2 CABIN FEED	AC 3 CABIN FEED	AC 4 CABIN FEED
ELEC SYSTEM Page 5			
DC 1 CABIN FEED	DC 2 CABIN FEED 1		
ELEC SYSTEM Page 6			
DC 2 CABIN FEED 2	DC 2 CABIN FEED 3	DC 2 CABIN FEED 4	

LIMITATIONS ELECTRICAL MANAGEMENT SYSTEM

1. CIRCUIT BREAKERS FOR DISABLED SYSTEMS (CONT'D)

A. Green Airplanes (Cont'd)

FUEL SYSTEM Page 1			
AFT TANK L PUMP	AFT TANK L SOV C		
FUEL SYSTEM Page 2			
AFT TANK L SOV O	AFT TANK R PUMP	AFT TANK R SOV C	AFT TANK R SOV O
FUEL SYSTEM Page 5			
R/D PANEL COCKPIT			
LIGHTS SYSTEM Page 3			
L LOGO LTS <SB 7001A11-33-001>			
LIGHTS SYSTEM Page 4			
NO SMOKING SIGN			
LIGHTS SYSTEM Page 5			
OXYGEN LTS			
LIGHTS SYSTEM Page 6			
R LOGO LT <SB 7001A11-33-001>			
LIGHTS SYSTEM Page 7			
SEAT BEALTS SIGNS			
LIGHTS SYSTEM Page 8			
WING TIP LTS			
NAV SYSTEM Page 1			
EVS <SB 7001A11-34-005>			
NAV SYSTEM Page 2			
FMS 3 CDU <SB 7001A11-34-004>			
NAV SYSTEM Page 4			
LIGHTNING SENSOR <SB 7001A11-34-002>			
NAV SYSTEM Page 6			
VOR/ILS 3			

LIMITATIONS ELECTRICAL MANAGEMENT SYSTEM

2. EMS CDU SWITCH CONTROL PAGE SETTINGS

A. Green Airplanes 9005 and Subsequent

Selections on the EMS SWITCH CONTROL page must be as follows for all phases of flight.

SWITCH CONTROL Page 1	
STALL WARN ADVANCE NORM	SLAT / FLAP RESET OFF
LEFT FOOTWARMER ON	RIGHT FOOTWARMER ON
HUMIDIFIER <SB 700-21-001> OFF	
SWITCH CONTROL Page 2	
AC 1 CABIN PWR OFF	AC 2 CABIN PWR OFF
AC 3 CABIN PWR OFF	AC 4 CABIN PWR OFF
SWITCH CONTROL Page 3	
DC 1 CABIN PWR OFF	DC 2 CABIN PWR 1 OFF
DC 2 CABIN PWR 2 OFF	DC 2 CABIN PWR 3 OFF

<> switch position limitation applies on airplanes not incorporating the referenced Service Bulletin (i.e., <SB 700xxx-xxx>).

**LIMITATIONS
ELECTRICAL MANAGEMENT SYSTEM**

THIS PAGE INTENTIONALLY LEFT BLANK