

LIMITATIONS AND OPERATING PARAMETERS**TABLE OF CONTENTS**

The information contained in this section meets or exceeds all requirements of the FAA approved Airplane Flight Manual (AFM). Both the AFM and Continental Airlines limitations are identified as “Limitations.”

The label **■** designates an AFM limitation, which has been further restricted by Company policy.

Flight crews are responsible for committing all information labeled “Limitations” to memory.

Additional “Operating Parameters” have been included in this section as a convenient reference. Flight crews are expected to have a working knowledge of these “operating parameters.”

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GENERAL LIMITATIONS

1. The B737 airplanes are certified in the transport category (FAR 25) and are eligible for the following types of operation when the required equipment is installed and approved in accordance with the applicable FARs.
 - Visual Flight (VFR)
 - Instrument Flight (IFR):
 - B737 Airplanes are category “C” for Instrument Approaches except for Circling, which is category “D”.
 - Night Flight
 - Icing Conditions
 - **7** **8** **9** Extended Overwater Operations (ETOPS)
2. Minimum Flight Crew:
 - Captain and First Officer

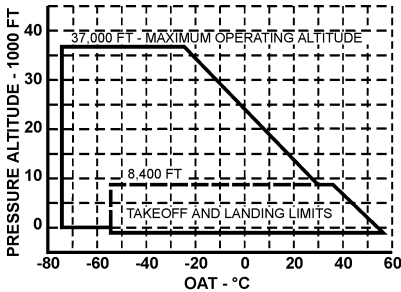
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OPERATING LIMITATIONS / PARAMETERS

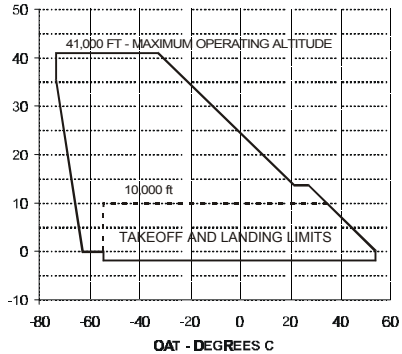
Limitations

1. Operational Envelope

3 3 5



7 8 9



2. Runway slope: ±2%

3. Maximum takeoff and landing tailwind component:

3 3 5 7 8 9 10 Knots

7 8 15 Knots in Quito, Ecuador, Runway 35.

7 8 9 15 Knots in San Jose, Costa Rica, Runway 25.

4. The maximum operating limit speed shall not be deliberately exceeded in any regime of flight.

5. Maximum operating altitude:

3 3 5	7 8 9
37,000 ft.	41,000 ft.

6. Maximum takeoff / landing altitude:

3 3 5	7 8 9
8,400 ft.	10,000 ft.

7. Maximum flight operating latitude:

3 3 5	7 8 9
73° North and 60° South	82° North and 82° South

8. If landing weight exceeds the chart value in the Maximum Quick Turn Around Weight Limits chart, Section 5, wait at least

③ ③ ⑤	⑦	⑧ ⑨
53 Minutes	62 Minutes	67 Minutes

then check wheel thermal plugs before making a subsequent takeoff. Maintenance may use an alternate approved procedure to ascertain acceptable brake temperatures for dispatch.

9. ⑦ ⑧ ⑨ Installation of handle covers on the overwing exits must be verified prior to departure whenever passengers are carried.

Operating Parameters

1. Turbulent air penetration speed:

③ ③ ⑤	⑦ ⑧ ⑨
280 knots /.73 Mach	280 knots /.76 Mach

Note: If severe turbulence is encountered at altitudes below 15,000 feet and the airplane gross weight is less than the maximum landing weight, the airplane may be slowed to 250 knots in the clean configuration.

2. Maximum tire speed: 195 knots
3. Demonstrated Crosswind Component
Maximum manufacturer demonstrated takeoff / landing crosswind component: 35 knots - dry runway.
4. ACCULOAD will generate a crosswind advisory when forecast crosswinds for takeoff or landing exceed 25 knots for wet runways or 15 knots for contaminated runways. This advisory will appear on line 10 of the ACCULOAD and in the T/O – LANDING PLAN SUMMARY of the predeparture paperwork.

GROSS WEIGHT, C.G. AND PERFORMANCE

Limitations

Maximum	3 3	5 (A/C 601 - 637)	5 (A/C 638 - 669)
Taxi Weight:	135,500 lbs.	130,000 lbs.	134,000 lbs.
Takeoff Weight:	135,000 lbs.	129,500 lbs.	133,500 lbs.
Landing Weight:	114,000 lbs.	110,000 lbs.	110,000 lbs.
Zero Fuel Weight:	106,500 lbs.	103,000 lbs.	103,000 lbs.

Maximum	7	8	9
Taxi Weight:	155,000 lbs.	174,700 lbs.	174,700 lbs.
Takeoff Weight:	154,500 lbs.	174,200 lbs.	174,200 lbs.
Landing Weight:	128,000 lbs.	144,000 lbs.	146,300 lbs.
Zero Fuel Weight:	120,500 lbs.	136,000 lbs.	140,300 lbs.

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SYSTEM LIMITS AND OPERATING PARAMETERS

Air Conditioning / Pressurization

Limitations

- System safety relief differential pressure: Maximum

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③	③	⑤					
⑦	⑧	⑨					
8.65 psi	9.10 psi						

- Maximum cabin differential for takeoff / landing: .125 psi

Operating Parameters

- When engine bleeds are on, do not operate air conditioning packs in high for takeoff, approach, and landing.
- Operating Differential Pressure:
 - | | | |
|---|---|---|
| ⑦ | ⑧ | ⑨ |
|---|---|---|

 8.35 ± .1 psi above 37,000 ft.
 - 7.8 ± .1 psi 28,000 through 37,000 ft.
 - 7.45 ± .1 psi below 28,000 ft.
- Duct pressure for maximum cooling: 20-25 psi
- Minimum duct pressure for two pack operation from one bleed source: 20-25 psi

Autopilot / Flight Director

Limitations

- Minimum altitude for autopilot engagement (climb and cruise) is 1,000 ft. AGL.
- For coupled single channel approaches with electronic glideslope, the autopilot shall not remain engaged below 50 ft. AGL.
- Use of Aileron Trim with the Autopilot engaged is prohibited.
- | | | |
|---|---|---|
| ⑦ | ⑧ | ⑨ |
|---|---|---|

 Autopilot use prohibited below 100' RA at airport pressure altitudes above 8400 feet.
- The autoland capability may only be used with flaps 30 and 40 with both engines operative.

6. Allowable winds for autoland:
- Headwind - 20 knots
 - Tailwind - 10 knots
 - Crosswind - 15 knots

Operating Parameters

1. For instrument approaches without electronic glideslope, the autopilot must be disengaged before descending more than 50 ft. below DA/DDA/MDA.
2. The Autoland System should not be used for overweight landings.
3. In the dual autopilot mode, the B737 incorporates a Fail – Passive Automatic Flight Control System. This system meets the applicable airworthiness and performance reliability requirements for auto coupled approaches and landings.

Auxiliary Power Unit (APU)

Limitations

1. (3)(3)(5) Max EGT: 760°C (7)(8)(9) - N/A
2. (3)(3)(5) Max Cont: 710°C (7)(8)(9) - N/A
3. APU bleed and electrical maximum altitude: 10,000 ft.
4. APU bleed maximum altitude: 17,000 ft.
5. APU electrical load maximum altitude:

(3)(3)(5)	(7)(8)(9)
35,000 ft.	41,000 ft.

Operating Parameters

1. (3)(3)(5) Do not operate APU above FL 350.
2. Operate one minute before using pneumatic air. Operate one minute with pneumatics off prior to shutdown.
3. Aborted Starts:
 - Ground - Allow 4 minutes between starts
 - Maximum 2 start attempts
 - Air - Allow 4 minutes between starts
 - Maximum 4 start attempts

4. ③ ③ ⑤ Successful starts not assured above FL 250.
5. After shutdown, wait 20 seconds for inlet door to close before turning battery switch to OFF.

Enhanced Ground Proximity Warning System

Limitations

1. Do not use the terrain display for navigation.
2. The uses of terrain awareness alerting and terrain display functions are prohibited within 15 nm and approaching to land at an airport not contained in the GPWS terrain database.
Note: ALL CAL Ops Spec Authorized Airports have been verified to be included in the EGPWS terrain database.
3. The use of Terrain Awareness and Terrain Display functions are prohibited when the FMC is in IRS only operation.
4. For takeoff, the use of Terrain Awareness and Terrain Display functions are prohibited until position verification has been accomplished.
5. For ditching, or other off-airport landings, the terrain awareness alerting and terrain display functions should be inhibited by selecting the TERR INHIBIT switch in INHIBIT.

Communication

Limitations

The Aircraft Communications And Reporting System (ACARS) is limited to transmission and receipt of messages that will not create an unsafe condition if the message is improperly received, such as the following conditions:

- The message or parts of the message are delayed or not received,
 - The message is delivered to the wrong recipient, or
 - The message content may be frequently corrupted.
1. Do not use VHF-3 for ATC communications with ACARS operational, or if audio entertainment system is in use.
 2. Do not use VHF COMM #2 or VHF COMM #3 on 120.00 MHZ as a primary means of communication. If frequency 120.00 MHZ is required use VHF COMM #1.
 3. When placard installed use VHF-2 for primary ATC COMM on ground.
 4. **7** **8** **9** The following HF frequencies are prohibited:
Listed in MHZ: 11.133 22.434 22.683 22.766

Operating Parameters

7 **8** **9** Use the VHF radio connected to the top of the fuselage antenna for primary ATC communications on the ground.

Electrical Power

Limitations

1. **7** **8** **9** Maximum single engine drive generator load: 75KVA – 215 amps (ground operations).

Operating Parameters

1. Minimum battery voltage for APU start: 23 volts
2. **3** **3** **5** Maximum engine driven generator load: 125 amps
3. **3** **3** **5** Maximum TR load: 65 amps
50 amps (ground operation without cooling)
4. TR voltage range: 24 - 30 volts
5. Battery bus voltage range: 22 - 30 volts

Fire Protection

Limitations

1. **3** **3** **5** Smoke Detection & Fire Suppression System (Ref. STC ST01674AT):
 - A. The cargo compartment smoke detector and fire suppression system must be verified to be serviced and operational before cargo can be carried in the cargo compartments.
 - B. The aircraft must land at the nearest suitable airport within 60 minutes after the activation of the suppression system.

Operating Parameters

1. Lavatory fire extinguishing: If evidence of overtemperature as indicated by black placard dot(s) or nozzle discharge (nozzle tip turns aluminum color), maintenance action required.
2. Engine fire extinguisher bottle pressure: 800 psi @ 70°F.

Flight Controls

Limitations

1. Maximum flap extension altitude: 20,000 ft.
2. **7 8 9** Holding in icing conditions with flaps extended is prohibited.
3. **7 8** Per Airworthiness Directives 2001-12-51 and 2002-08-52, "Do not operate the airplane at speeds in excess of 300 KIAS with speedbrakes extended.

WARNING: Use of speedbrakes at speeds in excess of 320 KIAS could result in a severe vibration which, in turn, could cause extreme damage to the horizontal stabilizer."

Note: Under the Captains Emergency Authority and after careful consideration, speedbrake deployment above 300 KIAS may be accomplished for emergency descent.

4. In flight, do not extend the speedbrake lever beyond the FLIGHT DETENT.
5. Flap limit speeds (IAS):

3 3 5 :

1 - 230 knots	15 - 195 knots
2 - 230 knots	25 - 190 knots
5 - 225 knots	30 - 185 knots
10 - 210 knots	40 - 158 knots

7 :

1 - 230 knots	■	15 - 195 knots
2 - 230 knots	■	25 - 170 knots
5 - 225 knots	■	30 - 165 knots
10 - 210 knots		40 - 156 knots

8 9 :

1 - 230 knots	■	15 - 200 knots
2 - 230 knots	■	25 - 190 knots
5 - 225 knots	■	30 - 175 knots
10 - 210 knots		40 - 162 knots

The label **■** designates an AFM limitation which has been further restricted by Company policy.

Operating Parameters

1. Alternate flap duty cycle (flight): One cycle:

Flaps 0-15	5 minutes off
Flaps greater than 15	25 minutes off

2. Alternate flap operation: Maximum airspeed - 230 knots to extend.
3. Speedbrake usage:
 - A. Should not be deployed in flight at radio altitudes less than 1000 ft.
 - B. Speedbrakes should not be deployed with flaps extended beyond flaps 15.
4. Mach Trim Fail (both channels):

③ ③ ⑤	⑦ ⑧ ⑨
280 KIAS / .74 Mach	280 KIAS / .82 Mach

Flight Management Computer

Operating Parameters

1. See MEL for restrictions.
2. Do not use the autopilot or the autothrottle for approach if the associated radio altimeter is inoperative.
3. The Flight Management Computer has been demonstrated to meet the requirement of FAA Advisory Circular 20-130A for a multi-sensor area navigation system when operated with radio or Global Position System (GPS) (if installed) updating. When operated in this configuration, the FMCS may be used for enroute and terminal operations.
4. The FMCS with dual FMC installation may be used as primary means for navigation for instrument approaches (excluding ILS, LOC, LOC-BC, LDA, SDF, and MLS) with ACTUAL (ANP) less than RNP.
5. The FMCS with single FMC installation may be used as a supplement to other primary means navigation for instrument approaches (with the exception of specifically approved and identified RNAV approaches).
6. ⑦ ⑧ ⑨ ADIRU alignment must not be attempted at latitudes greater than 78 degrees 15 minutes.

Fuel

Limitations

1. **7** **8** **9** (ETOPS) Perform an operational check of the fuel crossfeed valve during the last hour of cruise flight during each extended range operation. Enter valve failure conditions resulting from the operational check in the airplane log.
2. Maximum tank fuel temperature: 49°C.
3. Inflight tank fuel temperature must be maintained at least 3°C above the freezing point of the fuel being used or -45°C, whichever is higher.
4. Lateral fuel imbalance between wing tanks 1 and 2 must be scheduled to be zero. Random fuel imbalance must not exceed 1000 lbs.
5. Fuel Crossfeed valve must be closed for takeoff and landing.
6. Center tank fuel pump switches

Ground Operations (Per A.D. 2001-08-24)

- Center tank fuel pump switches must not be positioned to ON unless the center tank fuel quantity exceeds 1000 pounds (453 kilograms), except when defueling or transferring fuel.
- Center tank fuel pump switches must be positioned to OFF when both center tank fuel pump low-pressure lights illuminate.
- Center tank fuel pump switches must not be positioned to ON unless personnel are available on the flight deck to monitor low-pressure lights.

Note: Once the center tank fuel pump switches are turned on, they do not need to be turned off once the fuel quantity depletes to less than 1000 lbs.

7. **7** **8** **9** Center tank fuel pump switches:

Per AD 2002-19-52, and AD 2002-24-51 with AMOC 140S-02-376:

“The center tank fuel pumps must be OFF for takeoff if center tank fuel is less than 5,000 lbs. with the airplane readied for initial taxi.

Both center tank fuel pump switches must be selected OFF when center tank fuel quantity reaches approximately 1,000 lbs. during climb and cruise or 3,000 lbs. during descent and landing. The fuel pumps must be positioned OFF at the first indication of fuel pump low pressure.”

The center wing tank fuel quantity indication system must be operative to dispatch with center wing tank fuel.

“Note: The **CONFIG** indicator will annunciate when center tank fuel exceeds 1,600 lbs. and the center tank fuel pump switches are OFF. Do not accomplish the CONFIG non-normal procedure prior to or during takeoff with less than 5,000 lbs. of center tank fuel or during descent and landing with less than 3,000 lbs. of center tank fuel.

Note: In a low fuel situation, both center tank pumps may be selected ON and all center tank fuel may be used.

If the main tanks are not full, the zero fuel gross weight of the airplane plus the weight of center tank fuel may exceed the maximum zero fuel gross weight by up to 5,000 lbs. for takeoff, climb, and cruise and up to 3,000 lbs. for descent and landing, provided that the effects of balance (CG) have been considered.

If a center tank fuel pump fails with fuel in the center tank, accomplish the FUEL PUMP LOW PRESSURE non-normal procedure.

Prior to transferring or defueling conduct a lamp test of the respective fuel pump low pressure lights. When transferring or defueling from either the center or main wing tanks, the **FUEL PUMP LOW PRESSURE** indication lights must be monitored and the fuel pumps positioned to OFF at the first indication of fuel pump low pressure. Fuel may be transferred from tank to tank or the aircraft may be defueled with passengers on board, provided the fuel quantity in the tank from which fuel is being taken is maintained at not less than 2,000 pounds (900 kilograms). Deplane all passengers and non-essential crew when defueling a tank or transferring fuel from a tank that has a fuel quantity below 2,000 pounds (900 kilograms) until the process has been completed and the respective fuel boost pumps are turned off.

The limitations contained in this AD supersede any conflicting basic aircraft flight manual limitations.”

Operating Parameters

1. Fuel Loading

- A. Main wing tanks 1 and 2 must be scheduled to be full if the center wing tank contains more than 1000 lbs. of fuel. With 1000 lbs. of center tank fuel or less, partial wing tank fuel may be loaded provided the effects of balance have been considered.
- B. **(3)(3)(5)** The center wing tank must contain a minimum of 10,050 lbs. if auxiliary tank fuel is loaded.

2. Fuel Usage

Center Tank:

- If a center tank **LOW PRESSURE** light(s) illuminates during takeoff or initial climb, the center tank pump(s) may remain on until the climb attitude is reduced and the light(s) extinguishes or workload allows for the pump(s) to be positioned OFF. When established in a level attitude at cruise, if the center tank contains usable fuel and the center tank switches are OFF, the center tank pump switches should be positioned ON again.
- If the center tank contains more than 1000 lbs., the center tank switches must be turned ON. Verify the **LOW PRESSURE** lights extinguish and position both switches OFF when both **LOW PRESSURE** lights illuminate.
- Use center tank fuel to depletion, followed by main wing tank fuel. However, a maximum of 1000 lbs. may be retained in the center tank.

Auxiliary tank (if installed):

- **3 3 5** Auxiliary tank installed: Use auxiliary tank fuel and center wing tank fuel equally until auxiliary tank fuel is depleted.

3. Tank Capacity – Usable:

	3 3 5	7 8 9
Wing tanks	1,499 U.S. Gals/10043 lbs.	1,288 U.S. Gals / 8630 lbs.
Center tank	2,313 U.S. Gals/15497 lbs.	4,299 U.S. Gals / 28803 lbs.
Auxiliary tank	390 U.S. Gals/2620 lbs.	N/A

- Jet A and A1 fuels are approved for unlimited use in this engine. Fuels conforming to JP-5 or JP-8 are acceptable alternatives. The use of wide cut fuels (JP-4 and Jet B) is prohibited.
- Fuel Density is 6.7 lb/gal.
- Do not reset any tripped fuel pump or fuel control circuit breaker.

Hydraulic Power

Operating Parameters

1. Minimum fuel for stationary ground operations of electric hydraulic pumps on ground is 1,676 lbs. in each wing tank.

Ice And Rain Protection

WARNING: Do not rely on airframe visual icing cues to activate engine anti-ice. Delaying the use of engine anti-ice until ice buildup is visible from the cockpit may result in severe engine damage. Use the temperature and visible moisture criteria specified in this section.

Note: Icing conditions exist when OAT (ground) – TAT (airborne) is 10° C/50° F or below and:

- Visible moisture (clouds, fog with visibility less than one mile, rain, snow, sleet, ice crystals, and so on) is present, or
- Standing water, ice, slush or surface snow is present on the ramps, taxiways, or runways which may be ingested by the engines or freeze on engines or nacelles

Limitations

1. If the aircraft has been deiced:
The control column will be smoothly and slowly cycled from the full aft to the full forward position a minimum of three times to minimize the residual fluids in the balance bay during flight.
2. **7** **8** Per Airworthiness Directive 2002-08-20 / AMOC 120S-02-907:
“After ground deicing / anti-icing of the horizontal stabilizer using Type II or Type IV fluids, airspeed must be limited to 270 KIAS until the flight crew has been informed that applicable maintenance procedures have been accomplished that would allow exceedance of 270 KIAS. Once the applicable maintenance procedures have been accomplished, exceeding 270 KIAS is permissible until the next application of Type II or Type IV deicing / anti-icing fluids.”

Note:

- Aircraft is restricted to a maximum of 270 KIAS after using Type II or Type IV fluid application. No MACH restriction.
- Flight Plan Release (amended if required) displays 270-knot restriction.
- Restriction remains in effect for all flights until elevator tab surfaces are cleaned of Type II and Type IV fluids.
- It has been determined that Type I fluid does not affect the flight controls of the aircraft. If only Type I fluid is used for deicing / anti-icing, the speed restriction is not applicable.

Caution: Flight Crews will evaluate the need to land at the nearest suitable airport if in-flight vibrations (**ELEVATOR TAB LIMIT CYCLE OSCILLATION**) occur as a result of de-icing.

3. Engine anti-ice:

Must be ON during all ground operations, including after landing, when icing conditions exist or are anticipated.

Must be ON during all flight operations when icing conditions exist or are anticipated, except during climb and cruise when the temperature is below -40°C SAT .

Must be ON prior to and during descent in all icing conditions, including temperatures below -40°C SAT .

Engine ignition must be selected to CONT prior to and during engine anti-ice operation.

4. Wing anti-ice:

Must be ON during all ground operations between engine start and takeoff when icing conditions exist or are anticipated.

Do not operate wing anti-ice on the ground when the OAT is above $10^{\circ}\text{C}/50^{\circ}\text{F}$.

Do not use wing anti-ice as a substitute for ground de-icing/anti-icing.

Operating Parameters

1. Do not operate windshield wiper on a dry windshield.

2. Window heat must be ON 10 minutes before takeoff.

3. Pitot heat must be ON prior to takeoff.

■ 4. During takeoff, to meet second segment climb requirements, wing heat will not be used below 800 feet AGL.

Instrument And Navigation

Limitation

Altitude Display limits for RVSM Operations:

7 8 9

Standby altimeters do not meet altimeter accuracy requirements of RVSM airspace.

The maximum allowable in-flight difference between Captain and First Officer altitude displays for RVSM operations is 200 feet.

The maximum allowable on-the-ground display differences for RVSM operations are:

Field Elevation	Max Difference Between Captain & F/O	Max Difference Between Captain or F/O & Field Elevation
Sea Level to 5,000 Feet	50 Feet	75 Feet
10,000 Feet	60 Feet	75 Feet

1. Takeoff with the Forward Looking Predictive Windshear Warning Alert annunciated is not authorized.

Operating Parameters

1. Do not operate weather radar during fueling, near fuel spills, or near personnel except in test mode.
2. Altimeter differences:

3 3 5

ALTITUDE	ELEC/PNEU	ELEC/ELEC
SEA LEVEL	50 FEET	50 FEET
5,000 FEET	80 FEET	50 FEET
10,000 FEET	120 FEET	60 FEET
20,000 FEET	220 FEET	80 FEET
30,000 FEET	280 FEET	120 FEET
40,000 FEET	425 FEET	160 FEET

7 8 9

ALTITUDE	CDS/CDS	CDS/STANDBY
SEA LEVEL	50 FEET	50 FEET
5,000 FEET	50 FEET	80 FEET
10,000 FEET	60 FEET	120 FEET
15,000 FEET	70 FEET	(See Note)
20,000 FEET	80 FEET	(See Note)
25,000 FEET	100 FEET	(See Note)
30,000 FEET	120 FEET	(See Note)
35,000 FEET	140 FEET	(See Note)
40,000 FEET	160 FEET	(See Note)
41,000 FEET	170 FEET	(See Note)

Note: Above 10,000 feet and 0.4 Mach, position error causes the tolerance to diverge rapidly and direct crosscheck becomes inconclusive. Differences greater than 400 feet should be suspect and verified by ground maintenance checks.

Landing Gear

Limitations

1. Landing gear placard speeds:
 - A. Retract - 235 knots
 - B. Extend - 270 knots/.82M
 - C. Extended - 320 knots/.82M
2. Do not apply brakes until after touchdown.
- 3. Autobrakes: Arming the RTO feature is required on all takeoffs, if operable. Position the RTO selector to OFF if the autobrake system is inoperative.

Operating Parameters

1. Brake wear indicators should extend beyond the brake flange (with parking brake set).

Oxygen

Operating Parameters

1. The graph below is used to determine proper flight crew oxygen bottle pressure for variations of ambient temperature:

BOTTLE TEMPERATURE		NUMBER OF CREW USING OXYGEN		
°C	°F	2	3	4
-10	14	430	600	770
- 5	23	440	610	785
0	32	445	620	800
5	41	455	635	815
10	50	460	645	830
15	59	470	655	840
20	68	480	670	860
25	77	485	680	870
30	86	495	690	885
35	95	505	700	900
40	104	510	715	915
45	113	520	725	930
50	122	530	735	945

Minimum Dispatch Pressure
(PSI) for 114 Cubic Feet Bottle

2. Minimum number of cabin portable oxygen bottles aboard - at least one for each assigned Flight Attendant. (One F/A for each 50 seats or part thereof.)

Power Plant

Limitations

1. Reverse thrust for ground use only, Intentional use of reverse thrust in flight is prohibited.
2. Ignition must be on for:
 - Takeoff
 - Landing
 - Engine Anti-Ice Operation
 - Heavy Rain
3. Maximum and Minimum Engine Limits are red.
4. Caution Engine Limits are amber
5. **3 3 5** Normal Engine operating range is green.
6. **7 8 9** Normal Engine operating range is white.

3 3 5	7 8 9
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7. Maximum N₁:

106%	104.0%
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8. Maximum N₂:

105%	105%
------	------
9. Maximum EGT:

Takeoff (5 min):	930°C	950°C
Maximum Continuous:	895°C	925°C
Start (ground):	725°C	725°C
10. Minimum oil pressure:

13 psi	13 psi
--------	--------

 Oil pressure must be in normal range for takeoff.
11. Oil Temp

Maximum:	165°C	155°C
Maximum Continuous:	160°C	140°C
Maximum Allowable:		
3 3 5	160°C – 165°C (15 minutes)	
7 8 9	140°C – 155°C (45 minutes)	

③ ③ ⑤ Limitations

1. Both PMC's must be either ON or OFF for takeoff.
2. Operation with assumed temperature reduced takeoff thrust is not permitted with the Power Management Computer (PMC) in OFF mode.

⑦ ⑧ ⑨ Limitations

1. Both EECs must be either ON or ALT for takeoff.
2. Operation with assumed temperature reduced for takeoff thrust is not permitted with the Electronic Engine Control (EEC) in Alternate mode.

Operating Parameters

1. Minimum duct pressure for start:


③ ③ ⑤ 30 psi at sea level decreasing 1/2 psi per 1000 ft. above sea level.

⑦ ⑧ ⑨ N/A

2. Starter duty cycle: 2 min. ON, 20 sec. OFF (first two consecutive start attempts). Three minutes cooling required before third and subsequent consecutive start attempts.
3. Do not engage starter above 20% N₂.
4. Minimum oil quantity prior to engine start: ③ ③ ⑤ 3.0 Gals.
⑦ ⑧ ⑨ 60%.
5. Ambient temperature below -35°C (-31°F): Idle engine 2 minutes before changing thrust lever position.
6. Engine fan blades must be inspected by one of the pilots after flight in icing conditions.

LIST OF EFFECTIVE PAGES

PAGE	DATE	PAGE	DATE	PAGE	DATE
* TOC-1	11/15/02				
* TOC-2	11/15/02				
* 1	11/15/02				
* 2	11/15/02				
* 3	11/15/02				
* 4	11/15/02				
* 5	11/15/02				
* 6	11/15/02				
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* 20	11/15/02				
* 21	11/15/02				
* 22	11/15/02				
* LEP-1	11/15/02				
* LEP-2	11/15/02				

FAA APPROVED
12 NOV 2002

Don R. Klos
Principal Operations Inspector

* Asterisk indicates page(s) revised or added by the current revision.

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