



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

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Attachment 10 – Minimum Equipment List [Excerpts]

OPERATIONAL FACTORS/HUMAN PERFORMANCE

DCA19MA143



21-01 Air Conditioning Packs
21-01-01 All Passenger Configuration (All Models)
21-01-01-01 (-800 Without PATS Auxiliary Fuel Tanks)

Interval	Installed	Required	Procedure
C	2	1	(O)

Except for ER operations, one may be inoperative provided flight altitude remains at or below FL 250.

OPERATIONS (O)

For -800:

1. When dispatching with one operating pack supplied by engine bleed air on takeoff:
 - A. Determine V1(MCG) based on engine bleed for packs OFF.
 - B. Determine takeoff performance based on packs AUTO.
2. Limit altitude to FL 250.
3. For galley 4B or 4C food cart chiller installed, use only one chiller inflight.
4. Position the associated PACK switch to OFF.
5. Position the ISOLATION VALVE switch to CLOSE after starting engines.
6. If desired, for increased air flow when the flaps are extended (takeoff and landing), use the APU to supply bleed air to the operating pack.
 - A. Right pack inoperative
 - 1) Do the Supplementary Procedure - Air Systems "No Engine Bleed Takeoff and Landing" (Refer to the Flight Crew Operations Manual).

NOTE: Keep the pack switch for the right (inoperative) pack in the OFF position and the ISOLATION VALVE switch in the CLOSE position.
 - B. Left pack inoperative - PRIOR to takeoff or landing
 - 1) Engine No. 1 BLEED air switch to OFF
 - 2) R PACK switch to AUTO
 - 3) L PACK switch to OFF
 - 4) ISOLATION VALVE switch to OPEN
 - 5) Engine No. 2 BLEED air switch to OFF
 - 6) APU BLEED air switch to ON.
 - C. Left pack inoperative - AFTER takeoff or landing
 - 1) APU BLEED air switch to OFF
 - 2) Engine No. 2 BLEED air switch to ON
 - 3) ISOLATION VALVE switch to CLOSE



- 4) Engine No. 1 BLEED air switch to ON.

21-01 Air Conditioning Packs**21-01-01 All Passenger Configuration (All Models)****21-01-01-06 -800**

Interval	Installed	Required	Procedure
C	2	0	(M) (O)

Except for ER operations, both may be inoperative provided:

- Flight is conducted in an unpressurized configuration.
- Recirculation fan(s) operates normally.
- Both E/E equipment cooling exhaust fans operate normally.
- Procedures are established and used to ensure lower cargo compartments remain empty or are verified to contain only empty cargo handling equipment, ballast (ballast may be loaded in ULDs), and/or Fly Away Kits.
- Airplanes with Auxiliary tanks installed, auxiliary tanks remain empty or auxiliary fuel is included as part of zero fuel weight.

MAINTENANCE (M)

Configure airplane for unpressurized flight (AMM 21-00-00/901):

- Manually position the outflow valve in the full open position.
 - Position the Pressurization Mode selector to MAN.
 - Hold the VALVE toggle switch in the OPEN position until valve position indicator indicates full open.
- Deactivate (locked closed) the flow control and shutoff valve for the associated pack:
 - For the left flow control and shutoff valve, disconnect and stow the D488 or D15830 electrical connector.
 - For the right flow control and shutoff valve, disconnect and stow the D492 or D15834 electrical connector.
 - Do these steps to lock the flow control and shutoff valve in the closed position:
 - Pull out the manual control shaft.
 - Push in the manual control shaft.
- Open and collar the P6-4 Panel circuit breaker A/C OVERBOARD EXH VALVE RECONFIG CONT.
- Position one of the PACK switches in HIGH and placard.
- For passenger cabin telecommunications system installed, open and collar P6-1 Panel circuit breaker ENTERTAINMENT PASS TEL CTU.

OPERATIONS (O)

- Limit altitude to 10,000 ft. for passenger flights.

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**Section 2****737-800 MEL-CDL****ATA 21**

2. Non-passenger flights above 10,000 ft. require flight crew to be on oxygen.
3. Except for ditching, keep the outflow valve in the full open position.
4. Limit climb and descent rates to 500 FPM. to avoid passenger discomfort.
5. Position the ISOLATION VALVE switch to CLOSE after starting engines.
6. To improve passenger cabin and crew compartment temperatures:
 - A. If possible, pre-condition the cabin to a low temperature prior to dispatch. A low initial cabin temperature will result in a lower peak temperature.
 - B. Maintain the highest allowable flight altitude.
 - C. Minimize cabin heat by pulling the shades down and turning off unnecessary lights.
 - D. Position RECIRC FAN switch(es) to AUTO.
 - E. Estimated stabilized temperatures at the end of 30 minutes of flight are shown in this table:

NOTE 1: Limit number of passengers to 45.

NOTE 2: Prolonged operation at TAT below 10 degrees C / 50 degrees F can cause freezing of unheated water systems located in the aft lower lobe.

NOTE 3: Operation at TAT above 32 degrees C / 90 degrees F is not recommended due to the resulting high temperatures in the passenger and crew cabins.

TAT Degrees C	No. of Passenger	Passenger Cabin Temperature		Crew Cabin Temperature	
		Degrees F	Degrees C	Degrees F	Degrees C
-1	0	50	10	70	21
-1	45	70	21	75	24
10	0	70	21	90	32
10	45	80	27	95	35
21	0	90	32	110	43
21	45	95	35	110	43
32	0				
32	45				

7. The affected cargo compartment will be emptied or verified to carry only allowable items as defined in the Introduction Chapter. Alternatively, arrangements will be made to have the FAK removed and shipped by alternate means. FAK corrections must be made on the weight and balance manifest. Prior to departure, a crewmember or designated individual will verify that the affected cargo compartment is either empty or containing empty cargo restraints, only.

**36-05 Engine Bleed Air Shutoff Valves (PRSOV)****36-05-02 -800**

Interval	Installed	Required	Procedure
C	2	0	(M) (O)

Except for ER operations beyond 120 minutes, may be inoperative provided:

- Valve is secured closed before engine start.
- Airplane is not operated in known or forecast icing conditions.

MAINTENANCE (M)**For -800:**

Lock the associated engine bleed air valve in the closed position (AMM 36-00-00/901).

For All Models:

- Deactivate the leading edge slats in the retracted position (AMM 27-81-00/201).
- Deactivate the associated thrust reverser (AMM 78-31-00/201).
- Gain access to the engine bleed air valve by opening the appropriate fan cowl panel (AMM 71-11-02/201) and thrust reverser (AMM 78-31-00/201).
- Lock the engine bleed air valve in the CLOSED position.
 - Turn the override nut to align the position indicator with the CLOSED position.
 - Loosen the lock screw/knob bolt and push in locking knob to lock valve in closed position.
 - Retighten lock screw/knob bolt.
- Close fan cowl panel (AMM 71-11-02/201) and thrust reverser (AMM 78-31-00/201).
- Activate the thrust reverser (AMM 78-31-00/201).
- Activate the leading edge slats (AMM 27-81-00/201).

OPERATIONS (O)

NOTE 1: Use of the APU bleed air is limited to 17,000 feet. One air conditioning pack will be unusable when dispatching with: (1) the right engine bleed inoperative, (2) the left engine bleed inoperative and flight altitude greater than 17,000 feet, or (3) both engine bleeds inoperative.

NOTE 2: When dispatching with a single engine bleed on for takeoff (airplane pressurized), V1(MCG) should be determined based on AC packs OFF. Takeoff performance should be based on AC packs AUTO.

- Do not dispatch into known or forecast icing conditions.
- Associated engine bleed switch is selected to the OFF position.

3. For left engine bleed inoperative:
 - A. At altitudes 17,000 feet and below, operate the left pack using the APU bleed air, the right pack using the right engine bleed and the isolation valve CLOSE.
 - B. At altitudes above 17,000 feet, operate with the APU bleed air OFF.
 - 1) Limit altitude to FL 250.
 - 2) Operate the left pack using the right engine bleed, the right pack OFF and isolation valve OPEN.
4. For right engine bleed inoperative:
 - A. Limit altitude to FL 250.
 - B. Operate the left pack using the left engine bleed, right pack OFF, and isolation valve CLOSE.

NOTE: At altitudes 17,000 feet and below, increased air flow will occur when flaps are extended (takeoff and landing) and the APU is used instead of engine bleed to supply bleed air to the operating pack. Refer to Boeing Operations Manual, NO ENGINE BLEED TAKEOFF AND LANDING PROCEDURE.
5. For both engine bleeds inoperative:
 - A. Limit altitude to 17,000 feet.
 - B. Operate the left pack using APU bleed and isolation valve CLOSE. Refer to Boeing Operations Manual, NO ENGINE BLEED TAKEOFF AND LANDING PROCEDURE.