PRESSURIZATION CONTROL SYSTEM - ADJUSTMENT/TEST

EFFECTIVITY: ACFT MODEL(S) EMB-145

1. General

A. This section gives the procedures for the test of the pressurization system.

B. The procedures in this section are given in the sequence below. The tasks identified with (♦) are part of the Scheduled Maintenance Requirements Document (SMRD).

TASK NUMBER	*DESCRIPTION*	*EFFECTIVITY*
21-31-00-700-801-A ♦	PRESSURIZATION CONTROL SYSTEM - OPERATIONAL CHECK IN MANUAL MODE	ACFT MODEL(S) EMB-145
21-31-00-700-802-A	PRESSURIZATION CONTROL SYSTEM - FUNCTIONAL TEST IN AUTOMATIC MODE	ACFT MODEL(S) EMB-145
21-31-00-700-803-A	OPERATIONAL TEST OF QUICK DE-PRESSURIZATION IN AUTO AND MAN-UAL MODES	ACFT MODEL(S) EMB-145
21-31-00-700-804-A	FUNCTIONAL TEST OF OUTFLOW VALVES	ACFT MODEL(S) EMB-145
21-31-00-700-805-A	FUNCTIONAL TEST FOR CABIN LEAK-AGE WITH THE PRESSURIZATION TEST BENCH	ACFT MODEL(S) EMB-145
21-31-00-700-806-A ♦	FUNCTIONAL TEST FOR LINE LEAKAGE	ACFT MODEL(S) EMB-145
21-31-00-700-807-A ♦	FUNCTIONAL TEST OF OVERPRESSURI-ZATION RELIEF DEVICES	ACFT MODEL(S) EMB-145
21-31-00-700-808-A	FUNCTIONAL TEST FOR CABIN LEAK-AGE WITH AIR BLED FROM THE ENGINE OR APU	ACFT MODEL(S) EMB-145
21-31-00-700-809-A ♦	FUNCTIONAL TEST OF OVERPRESSURI-ZATION RELIEF DEVICES WITH PITOT/ STATIC SYSTEM TEST SET	ACFT MODEL(S) EMB-145

TASK 21-31-00-700-801-A
EFFECTIVITY: ACFT MODEL(S) EMB-145

2. PRESSURIZATION CONTROL SYSTEM - OPERATIONAL CHECK IN MANUAL MODE

A. General

(1) This task gives the procedures to do the operational check in the manual mode.

B. References

REFERENCE	*DESIGNATION*
AMM TASK 36-00-00-860-801-A/200	PNEUMATIC ENERGY - AIR BLEED THROUGH ONE OF THE ENGINES
AMM TASK 36-00-00-860-802-A/200	PNEUMATIC ENERGY - AIR BLEED THROUGH THE APU
TASK 21-31-02-04	-

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	A - Does the task	Cockpit
1	B - Helps technician A	Cockpit

I. Preparation

SUBTASK 842-045-C

(1) Make sure that the APU (AMM TASK 36-00-00-860-801-A/200) or the engines (AMM TASK 36-00-00-860-802-A/200) are not in operation.

J. Operationally Check Pressurization Control System in Manual Mode (Figure 501)

WARNING: MAKE SURE THAT THE AIRCRAFT IS IN A SAFE CONDITION BEFORE YOU DO THE MAINTENANCE PROCEDURES. THIS IS TO PREVENT INJURY TO PERSONS AND/OR DAMAGE TO THE EQUIPMENT.

SUBTASK 841-047-B

(1) Before you start the operational test of the pressurization system in manual mode, do a check on the manual controller knob end stop position as follows:

(a) Turn the manual controller knob fully counterclockwise and check if it is aligned with and inside the green mark. The knob indication must be in front of the green mark on the counterclockwise end stop. This is the normal notched position (end stop). If the control knob end stop is out off the green mark position, replace the manual controller (TASK 21-31-02-04).

NOTE: The green mark is the reference where the extreme down position has to be set (end stop). Incorrect position of the control knob will lead to a drift of the pressure values on the EICAS. It impacts the regulator value when knob is moved to "level flight" position.

(2) Turn the manual controller knob to UP (end stop clockwise).

SUBTASK 841-048-B

(3) Supply the pneumatic energy with the LH engine or RH engine at 80% N2 (AMM TASK 36-00-00-860-801-A/200) or with the APU (AMM TASK 36-00-00-860-802-A/200).

SUBTASK 710-010-B

WARNING: PERSONS WHO WILL STAY ON THE AIRCRAFT DURING THE TEST MUST BE IN GOOD HEALTH CONDITION. IF A PERSON FEELS PAIN IN THE EARS DURING PRESSURE CHANGES, THE PRESSURE MUST BE IMMEDIATELY MADE STABLE AND DECREASED UNTIL THE PERSON COME BACK TO NORMAL OR IS REMOVED FROM THE AIRCRAFT.

(4) Set the controls and switches below as follows:

NOTE: After you select the knob position, the pressurization control system will take some seconds to respond and stabilize. You must do a new selection (from up to down and back) only after the system stabilization.

(a) PACK 1 and PACK 2 - ON.

(b) AUTO/MAN digital controller - MAN.

(c) Manual Controller - UP (end stop clockwise).

Result:

1 The CAB ΔP shown on the EICAS must be 0.1 psi maximum.

NOTE: The pneumatic outflow valve opens fully. The electropneumatic outflow valve may be slightly open.

(d) Close all aircraft doors and windows.

(e) Turn the manual controller knob slowly counterclockwise until the cabin altitude rate of change (CAB RATE on the EICAS) is down to - 500 ft/min. Wait the

system stabilization at 500ft/min. At the same time, make sure that the manual controller knob is at the eleven o' clock position and inside the white mark.

NOTE:
- If the pressure altitude at the test field is equal to or less than 350 ft, the cabin altitude will be less than - 1500 ft, and the CAB ALT message goes out of view and amber dashes are shown.
- When the system is in the manual mode, the manual controller drives the POV, as given by its knob position. It is necessary that you actuate the manual controller and monitor the pressurization parameters on the EICAS.

(f) When the differential pressure (CAB ΔP on the EICAS) is equal to 1.0 psi, turn the manual controller knob clockwise to level off the cabin altitude (CAB RATE equal to zero).

(g) Turn the manual controller knob slowly to the UP position (end stop clockwise).

Result:

1 The CAB RATE is higher than 2000 ft/min.

NOTE: The CAB RATE message goes out of view and amber dashes are shown.

- For aircraft with EICAS version lower than 20.5, amber dashes will be displayed when the cab rate is higher than 2000 ft/min.
- For aircraft with EICAS version 20.5 and on, amber dashes will be displayed when the cab rate is higher than 4000 ft/min.

(5) Set the controls and switches below as follows:

(a) PACK 1 and PACK 2 - OFF.

(b) AUTO/MAN digital controller - AUTO.

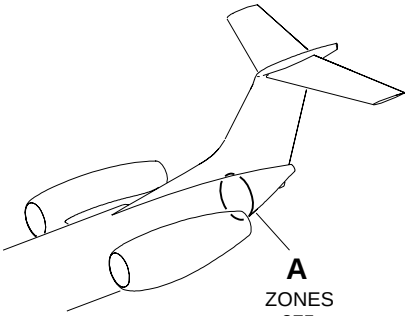
(c) Manual Controller - Back to green mark (end stop counterclockwise)..

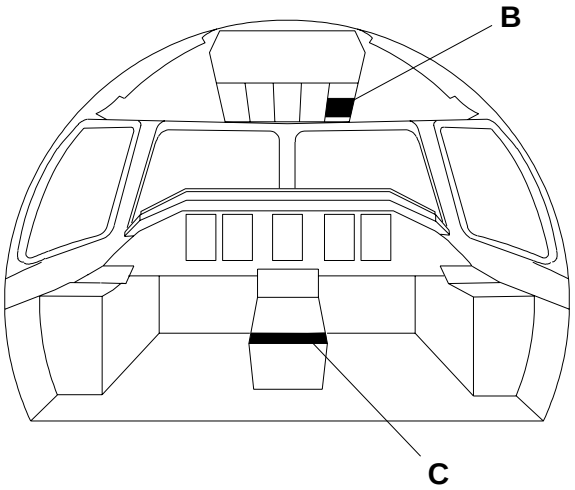
K. Follow-on

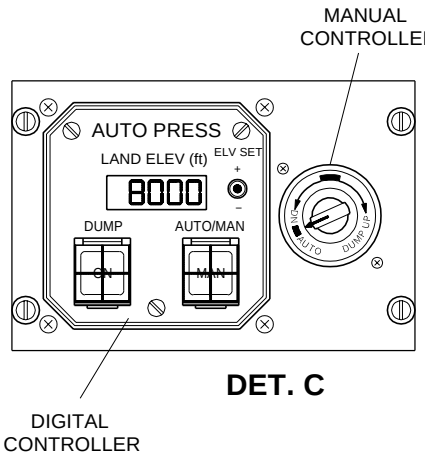
SUBTASK 842-045-D

(1) Stop the pneumatic energy supply (AMM TASK 36-00-00-860-801-A/200) or (AMM TASK 36-00-00-860-802-A/200).

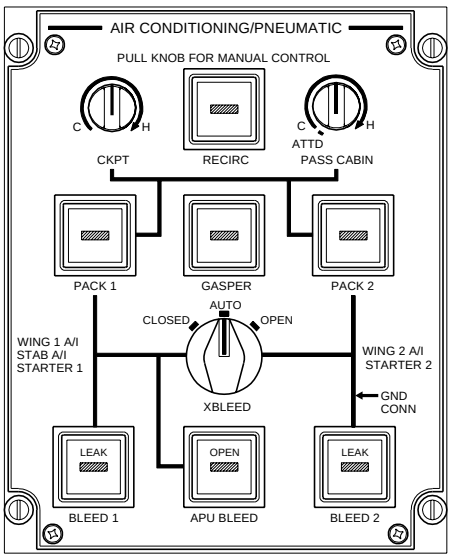
EFFECTIVITY: ACFT MODEL(S) EMB-145
Operational Check in Manual Mode - Location
Figure 501 - Sheet 1



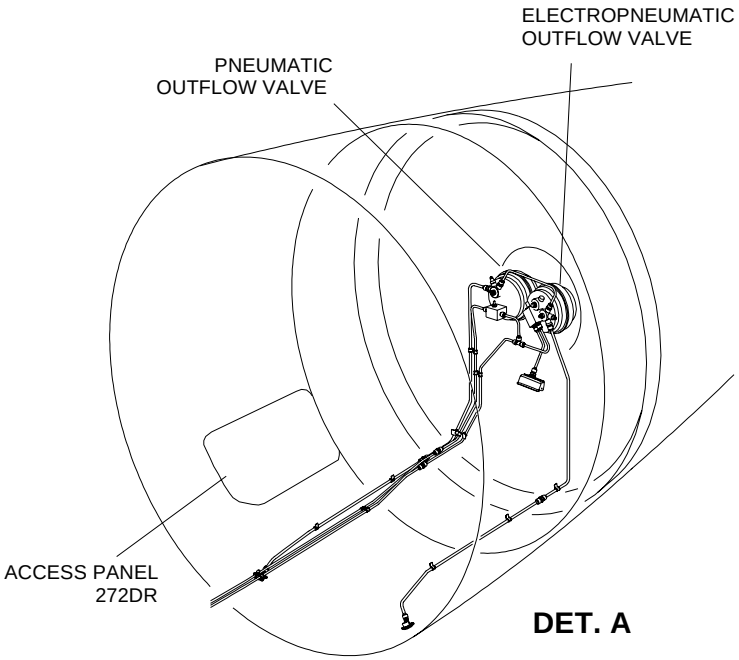




DET. C



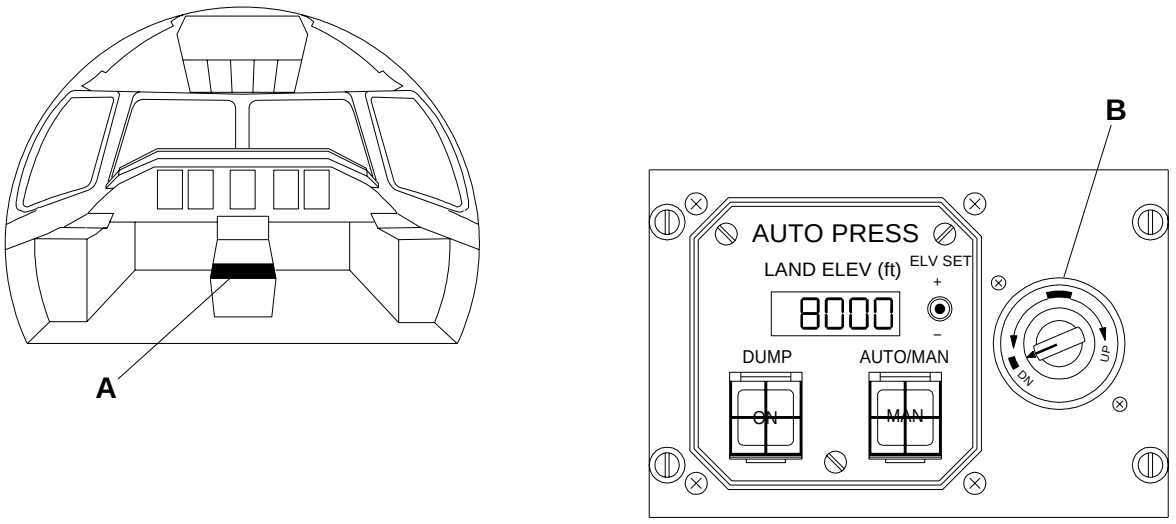
DET. B



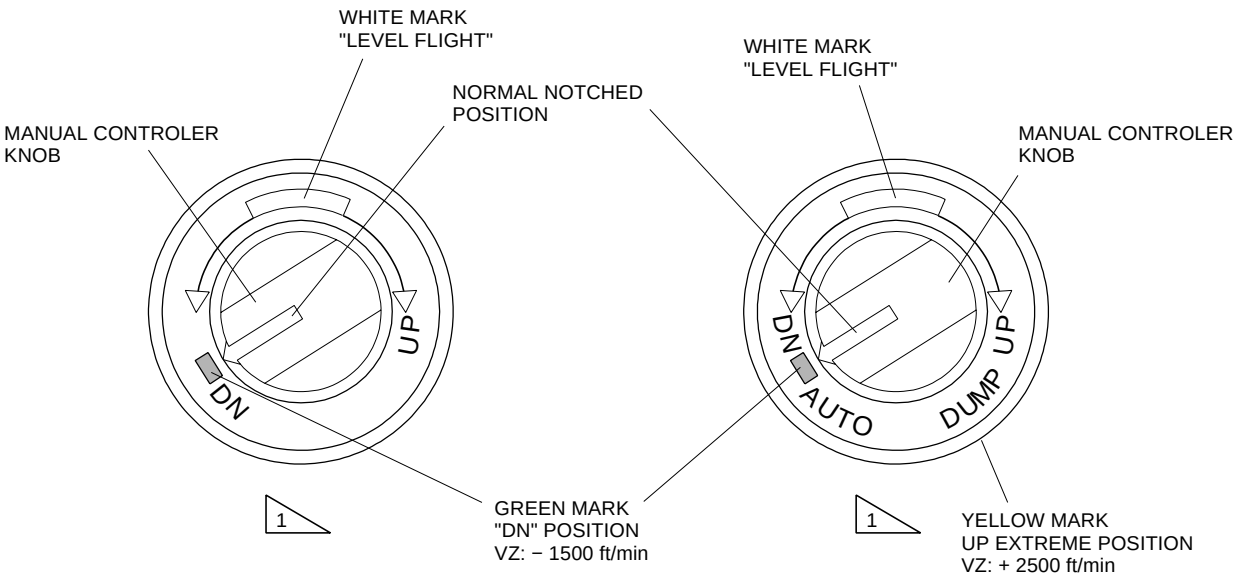
DET. A

145AMM210038.MCE E

EFFECTIVITY: ACFT MODEL(S) EMB-145
Operational Check in Manual Mode - Location
Figure 501 - Sheet 2



DET. A



DET. B

1 IF APPLICABLE TO AIRCRAFT CONFIGURATION.

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TASK 21-31-00-700-802-A
EFFECTIVITY: ACFT MODEL(S) EMB-145

3. PRESSURIZATION CONTROL SYSTEM - FUNCTIONAL TEST IN AUTOMATIC MODE

A. General

(1) This task gives the procedures to do the functional test in the automatic mode.

B. References

REFERENCE	*DESIGNATION*
AMM TASK 36-00-00-860-801-A/200	PNEUMATIC ENERGY - AIR BLEED THROUGH ONE OF THE ENGINES
AMM TASK 36-00-00-860-802-A/200	PNEUMATIC ENERGY - AIR BLEED THROUGH THE APU

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Stopwatch	To measure the elapsed time	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Cockpit

I. Preparation

SUBTASK 841-049-B

(1) Close all aircraft doors and windows.

(2) Supply the pneumatic energy with the RH engine at 80% N2 (AMM TASK 36-00-00-860-801-A/200) or with the APU (AMM TASK 36-00-00-860-802-A/200).

J. Functionally Test Pressurization Control System in Automatic Mode (Figure 502)

SUBTASK 720-038-B

(1) Do the functional test as follows:

(a) Set the switches and controls below as follows:

– PACK 1 and PACK 2 - ON.

– LH thrust lever - IDLE.

– AUTO/MAN digital controller - AUTO.

– Manual controller - DN.

– Baro correction knob - Set to the current barometric pressure at the test field.

– ELV SET switch - Set the LAND ELEV to 1100 ft below the test field altitude.

Result:

1 The CAB ΔP shown on the EICAS must be 0.1 psi maximum.

(b) Read the CABIN ALT indication on the EICAS.

(c) LH thrust lever - THRUST SET.

Result:

1 The cabin pressurizes at a rate of - 450 ft/min ± 10% (CPCS accuracy) ± 50 ft/min (CPAM accuracy) until the cabin altitude is 400 ft ± 200 ft (CPCS accuracy) ± 100 ft (CPAM accuracy) below the read altitude (pre-pressurization altitude).

NOTE: At the pre-pressurization altitude, the cabin-altitude rate-of-change must be equal to zero.

(d) Open all the AIR/GND circuit breakers.

Result:

1 The pre-pressurization altitude stays constant for approximately 15 minutes. After this, the cabin pressurizes at a rate of - 450 ft/min ± 10% (CPCS accuracy) ± 50 ft/min (CPAM accuracy) until the cabin altitude is 325 ft (11 mbar) ± 200 ft (CPCS accuracy) ± 100 ft (CPAM accuracy) below the set landing field altitude (corrected landing-field altitude).

NOTE: At the corrected landing-field altitude, the cabin-altitude rate-of-change must be equal to zero.

(e) Set the ELV SET switch to the test field altitude.

Result:

1 The cabin pressure is released at a rate of:

- 650 ft/min ± 10% (CPCS accuracy) ± 50 ft/min (CPAM accuracy), on aircraft with CPCS digital controller of the P/N 22250Mxxxxxx series;
- 600 ft/min ± 10% (CPCS accuracy) ± 50 ft/min (CPAM accuracy), on aircraft with CPCS digital controller of the P/N 22250Nxxxxxx series;
- 700 ft/min ± 10% (CPCS accuracy) ± 50 ft/min (CPAM accuracy), on aircraft with CPCS digital controller of the P/N 92185Axxxxxx;

Until the cabin altitude is 325 ft (11 mbar) ± 200 ft (CPCS accuracy) ± 100 ft (CPAM accuracy) below the set landing field altitude (corrected landing-field altitude).

NOTE: At the corrected landing-field altitude, the cabin-altitude rate-of-change must be equal to zero.

(f) Set as follows:

– Thrust lever - IDLE.

– AIR/GND circuit breakers - Closed.

Result:

1 The cabin depressurizes at a rate of 650 ft/min ± 10% (CPCS accuracy) ± 50 ft/min (CPAM accuracy), until the CAB ΔP is 0.1 psi max.

(2) Make sure that the controls below are set as follows:

– AUTO/MAN digital controller - AUTO

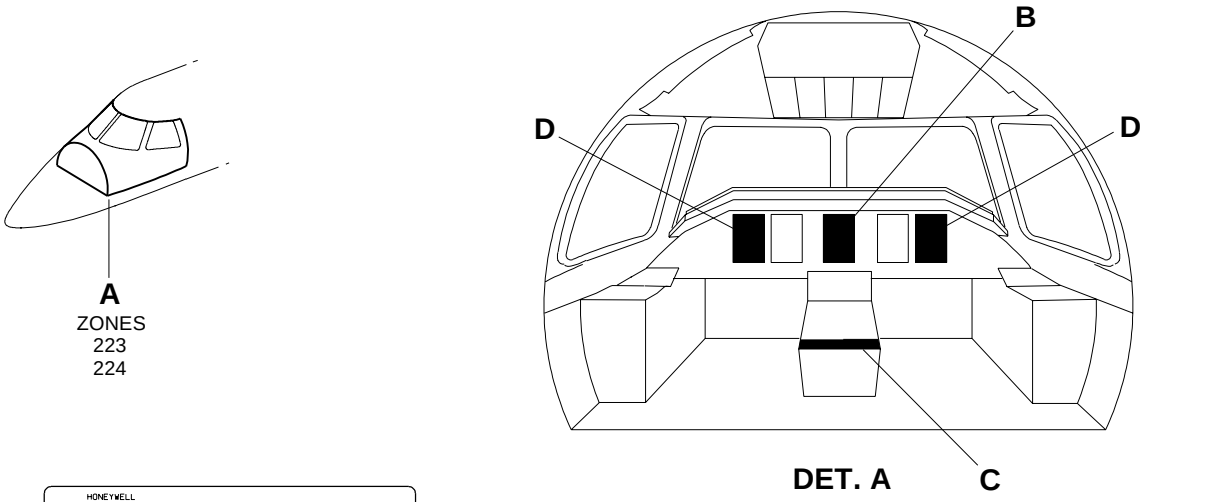
– Manual Controller - DN

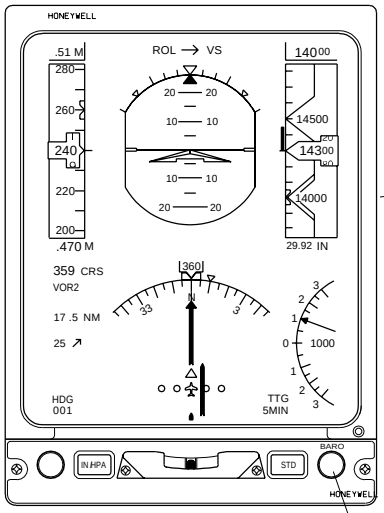
K. Follow-on

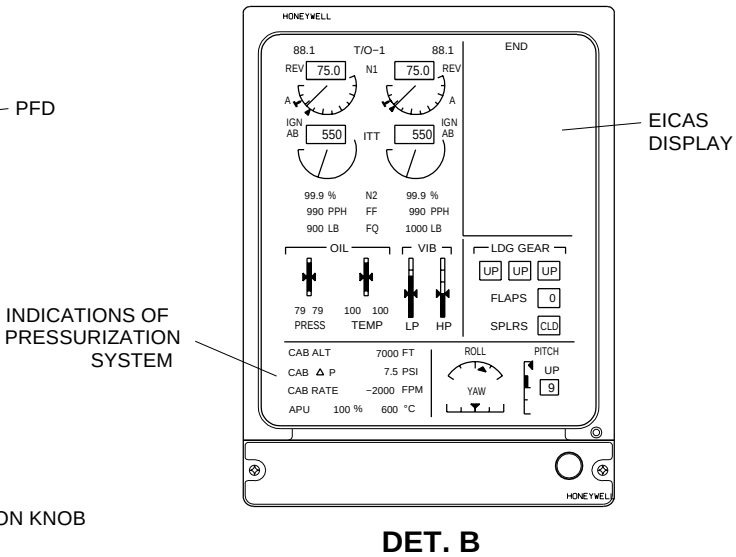
SUBTASK 842-046-B

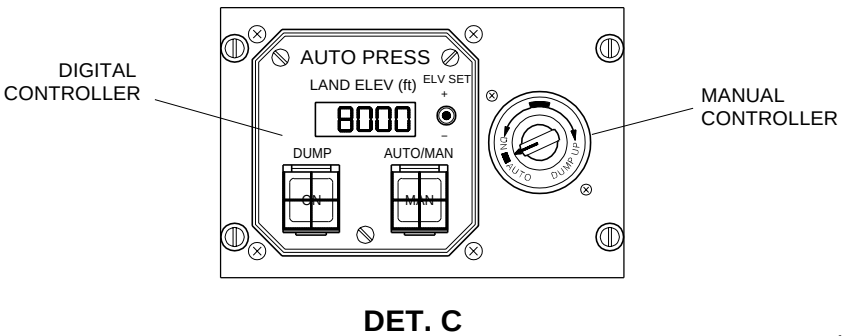
(1) Stop the pneumatic energy supply (AMM TASK 36-00-00-860-801-A/200) or (AMM TASK 36-00-00-860-802-A/200).

EFFECTIVITY: ACFT MODEL(S) EMB-145
Functional Test in Automatic Mode - Location
Figure 502









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TASK 21-31-00-700-803-A
EFFECTIVITY: ACFT MODEL(S) EMB-145

4. OPERATIONAL TEST OF QUICK DEPRESSURIZATION IN AUTO AND MANUAL MODES

A. General

(1) This task gives the procedures to do the operational test of the quick depressurization.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
191	191EL, 191FR	Wing-to-fuselage fairing
272	272DR	Rear fuselage I

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Compressed Air Source (filtered air) with a capacity higher than 20 ± 1 psi (137.90 ± 6.89 KPa)	To supply air to the vacuum pump	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	A - Does the task	Cockpit
1	B - Helps technician A	Outflow valves

I. Preparation

SUBTASK 841-050-B

(1) Remove access panels 191EL and 191FR (AMM MPP 06-41-01/100).

(2) Remove access panel 272DR (AMM MPP 06-41-01/100).

(3) Disconnect the pressure tube from the bleed line and connect the compressed air source.

(4) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

J. Operational Test of Quick Depressurization in Auto and Manual Modes (Figure 503)

SUBTASK 710-011-B

(1) Do the operational test of quick depressurization in the Auto Mode as follows:

(a) Set the switches and controls below as follows:

– AUTO/MAN digital controller - AUTO.

– Manual Controller - DN.

– LH Thrust lever - IDLE.

Result:

1 The outflow valves open fully.

(b) LH Thrust lever - THRUST SET.

Result:

1 The outflow valves close fully.

(2) For the test of the DUMP function, do as follows:

(a) Set the DUMP digital controller switch - ON.

Result:

1 Outflow valves open fully.

(3) Do the operational test of quick depressurization in the Manual Mode as follows:

(a) Set the switches and controls below as follows:

– AUTO/MAN digital controller - MAN.

– Manual Controller - DN.

Result:

1 The outflow valves close fully.

(b) Manual controller - UP.

Result:

1 The pneumatic outflow valve opens fully. The electropneumatic outflow valve may be slightly open.

(4) Set the switches and controls below as follows:

- AUTO/MAN digital controller - AUTO.
- Manual Controller - DN.

K. Follow-on

SUBTASK 842-047-B

(1) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

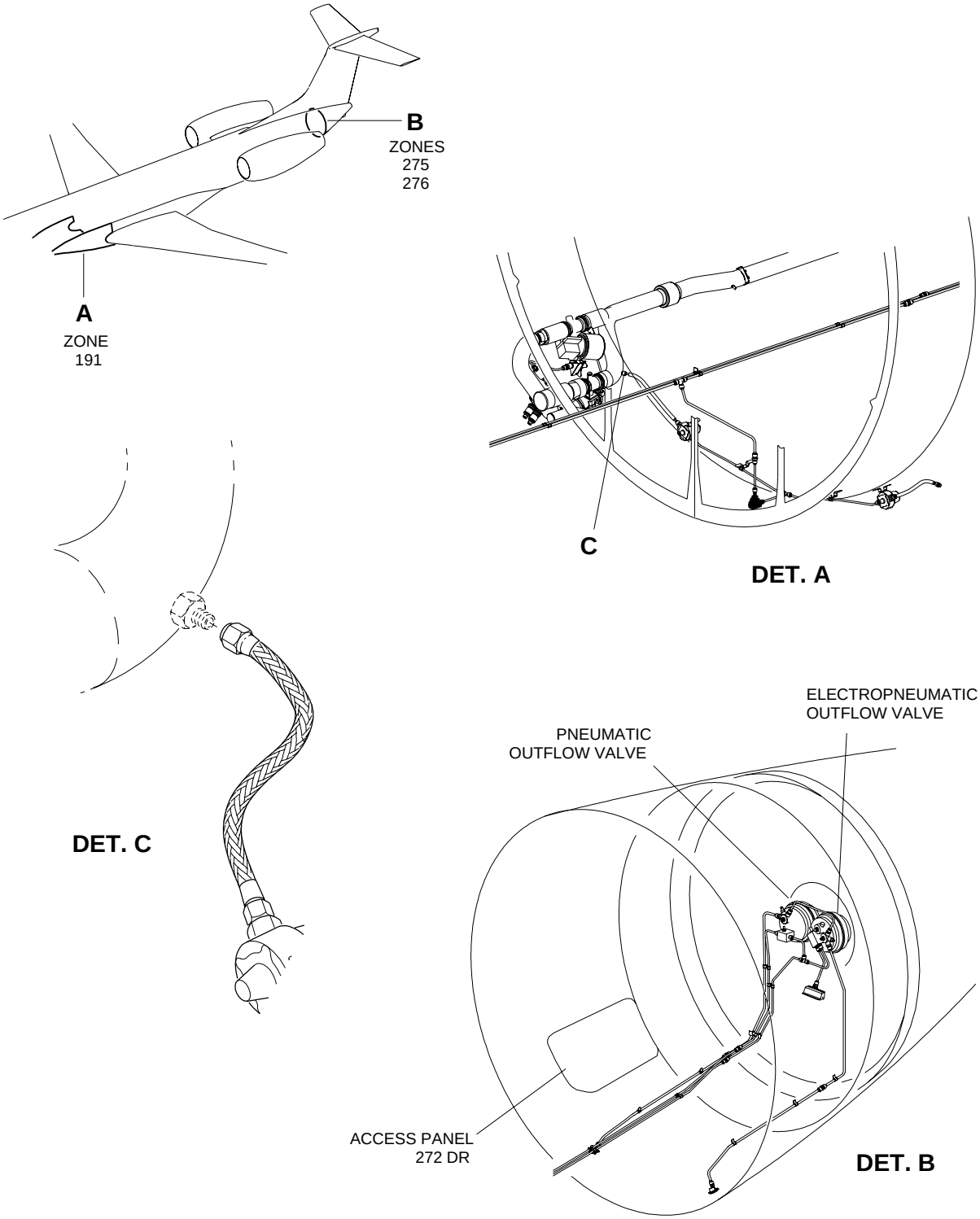
(2) Disconnect the compressed air source and connect the pressure tube to the bleed line.

(3) Install access panels 191EL and 191FR (AMM MPP 06-41-01/100).

(4) Install access panel 272DR (AMM MPP 06-41-01/100).

EFFECTIVITY: ACFT MODEL(S) EMB-145

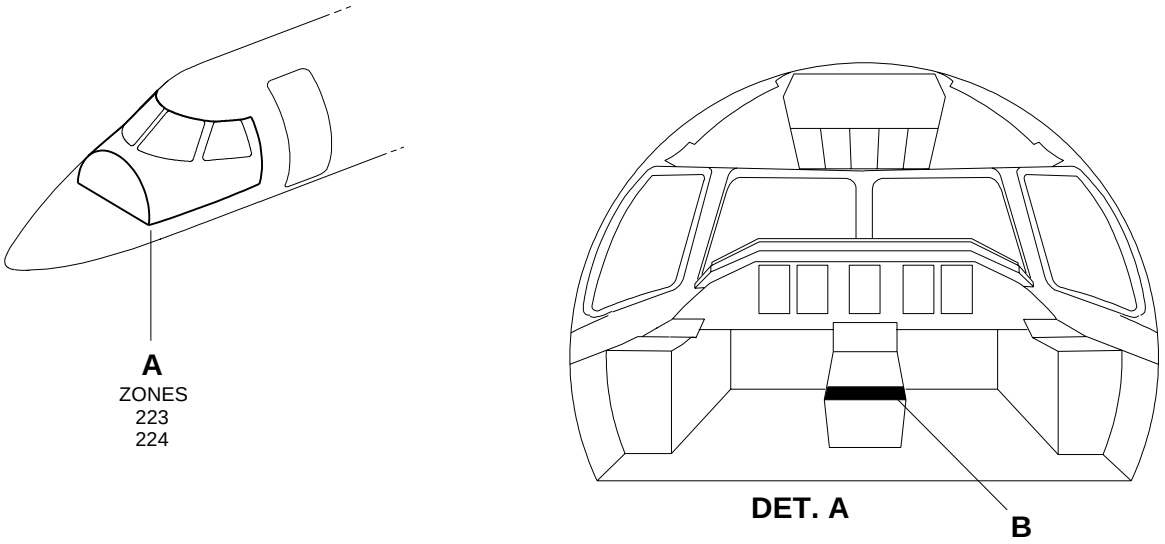
Operational Test of Quick Depressurization and Functional Test of Outflow Valves
Figure 503 - Sheet 1

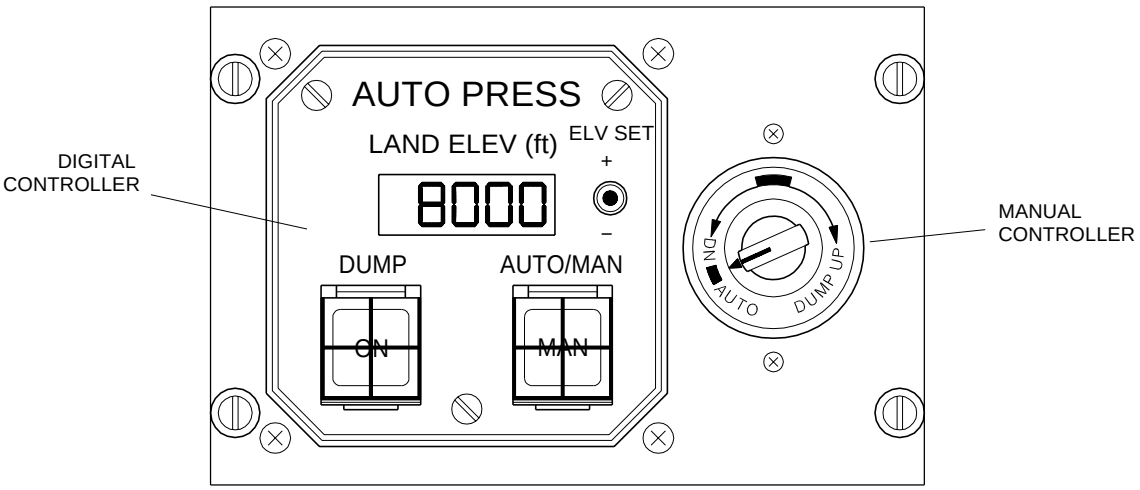


145AMM210061.MCE C

EFFECTIVITY: ACFT MODEL(S) EMB-145

Operational Test of Quick Depressurization and Functional Test of Outflow Valves
Figure 503 - Sheet 2





DET. B

145AMM210059.MCE E

TASK 21-31-00-700-804-A
EFFECTIVITY: ACFT MODEL(S) EMB-145

5. FUNCTIONAL TEST OF OUTFLOW VALVES

A. General

(1) This task gives the procedures to do the functional test of the outflow valves.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
AMM TASK 36-00-00-860-802-A/200	PNEUMATIC ENERGY - AIR BLEED THROUGH THE APU
AMM TASK 49-10-00-910-803-A/200	APU - SHUTDOWN
AMM TASK 49-13-00-910-803-A/200	APU - SHUTDOWN

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
191	191	Wing-to-fuselage fairing (TEST WITH EXTERNAL COMPRESSED AIR SOURCE)
272	272DR	Rear fuselage I

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Compressed Air Source (filtered air) with a capacity of 20 ± 1 psi (137.90 ± 6.89 KPa)	To supply air to the vacuum pump (TEST WITH EXTERNAL COMPRESSED AIR SOURCE)	
Commercially available	Stopwatch	To measure the outflow valve opening and closing times	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	A - Does the task	Cockpit

(Continued)

QTY	FUNCTION	PLACE
1	B - Helps technician A	Outflow valves

I. Preparation

SUBTASK 841-051-B

EFFECTIVITY: TEST WITH AIR SUPPLY FROM APU

(1) Remove access panel 272DR (AMM MPP 06-41-01/100).

(2) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

(3) Pressurize the lines with air from the APU (AMM TASK 36-00-00-860-802-A/200).

J. Preparation

SUBTASK 841-052-B

EFFECTIVITY: TEST WITH EXTERNAL COMPRESSED AIR SOURCE

(1) Remove the forward lower fairing (191) (AMM MPP 06-41-01/100).

(2) Remove access panel 272DR (AMM MPP 06-41-01/100).

(3) Disconnect the pressure tube from the vacuum pump and connect the compressed air source.

(4) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

K. Functionally Test Outflow Valves

SUBTASK 720-039-B

(1) Do the functional test as follows:

(a) Set the switches and controls as follows:

– LH thrust lever - IDLE.

– AUTO/MAN Digital Controller - AUTO.

– Manual Controller - DN.

Result:

1 The outflow valves open fully.

(b) Set the LH thrust lever - “THRUST SET”.

Result:

1 The maximum outflow valve closing time is 35 seconds.

(c) Set the DUMP digital controller switch - ON.

Result:

1 The maximum outflow valve opening time is 14 seconds.

(d) Set the DUMP digital controller switch to the off position.

Result:

1 The outflow valves close.

(e) Set the LH thrust lever - IDLE.

Result:

1 The maximum outflow valve opening time is 14 seconds.

(f) Set the digital controller - MAN.

Result:

1 The outflow valves close fully.

(g) Set the manual controller - UP.

Result:

1 The maximum time for the pneumatic outflow valve to open is 20 seconds. This time must be measured from the moment that the valve starts its movement until it opens fully.

(h) Set the manual controller - DN.

Result:

1 The maximum time for the pneumatic outflow valve to close is 40 seconds. This time must be measured from the moment that the valve starts its movement until it closes fully.

(2) Set the switches as follows:

- XBLEED - AUTO
- APU BLEED - OFF
- AUTO/MAN Digital Controller - AUTO.
- Manual Controller - DN.

L. Follow-on

SUBTASK 842-048-B

EFFECTIVITY: TEST WITH AIR SUPPLY FROM APU

(1) Stop the APU (AMM TASK 49-10-00-910-803-A/200 for APU T-62T-40C11 or AMM TASK 49-13-00-910-803-A/200 for APU T-62T-40C14).

(2) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(3) Install access panel 272DR (AMM MPP 06-41-01/100).

M. Follow-on

SUBTASK 842-049-B

EFFECTIVITY: TEST WITH EXTERNAL COMPRESSED AIR SOURCE

(1) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(2) Disconnect the compressed air source and connect the pressure tube to the vacuum pump.

(3) Install access panel 272DR (AMM MPP 06-41-01/100).

(4) Install the forward lower fairing (191) (AMM MPP 06-41-01/100).

TASK 21-31-00-700-805-A
EFFECTIVITY: ACFT MODEL(S) EMB-145

6. FUNCTIONAL TEST FOR CABIN LEAKAGE WITH THE PRESSURIZATION TEST BENCH

A. General

(1) This task gives the procedures to find a cabin leakage. For this procedure, the cabin is pressurized with the pressurization test bench.

(2) To pressurize the cabin with air bled from the engine or APU, refer to AMM TASK 21-31-00-700-808-A/500.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM TASK 21-31-00-700-808-A/500	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
191	191FR	Wing-to-fuselage fairing
272	272DR	Rear fuselage I

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
GSE 038	Pressurization Test Bench	To pressurize the aircraft	
GSE 037	Adapter - Cabin Pressurization Test	To permit the connection of the pressurization test bench to the aircraft	

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
AS5168-D05	Plug	To seal the reference pressure tube	1

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	A - Does the task	Pressurization test bench
1	B - Helps technician A	Outflow valves

I. Preparation

SUBTASK 841-053-B

(1) Remove access panel 191FR (AMM MPP 06-41-01/100).

(2) Connect the test bench to the aircraft with the adapter.

(3) Remove access panel 272DR (AMM MPP 06-41-01/100).

(4) Disconnect the reference pressure tube from the pneumatic outflow valve and seal the tube with the plug.

(5) Install access panel 272DR (AMM MPP 06-41-01/100).

(6) On the CPCS digital controller, in the control pedestal, set the AUTO/MAN switch to the MAN position (pushed).

J. Functionally Test Cabin Leakage (Figure 504)

SUBTASK 720-040-B

WARNING:
- **DO THE TEST IN AN OPEN AREA OR WITH THE HANGAR DOORS FULLY OPEN. USE A ROPE TO ISOLATE THE AREA WHERE THE AIRCRAFT IS, FOR SAFETY.**
- **DO NOT PERMIT PERSONS NEAR THE AIRCRAFT OR ON IT, SPECIALLY NEAR THE DOORS AND EMERGENCY EXITS.**
- **DO NOT OPEN THE DOORS DURING THE TEST.**

(1) Pressurize the aircraft with a rate below 5000 ft/min, until the test-bench pressure gauge shows a differential pressure of 7.8 psi.

NOTE: For the operation of the pressurization test bench, refer to the test-bench manufacturer's manual.

(2) Set the test bench as necessary to stabilize the cabin at that pressure (rate of climb = zero).

(3) Find the cabin leakage through the test bench flowmeter, correct it to ISA pressure (sea level) and temperature conditions, and convert it to lb/min.

NOTE: The maximum permitted value for cabin leak is 11 lb/min at the sea level and ISA condition.

(4) If the value of the flow found in the test is greater than the specified value, look for leakage through tubing passages, control cables, riveting in general, doors, seals, emergency exits, ram-air check valves, and windows.

(5) Fully release the pressure in the cabin with a maximum outflow rate of 5000 ft/min.

K. Follow-on

SUBTASK 842-050-B

(1) Disconnect the test bench and the adapter from the aircraft.

(2) Install access panel 191FR (AMM MPP 06-41-01/100).

(3) Remove access panel 272DR (AMM MPP 06-41-01/100).

(4) Remove the plug and connect the reference pressure tube to the pneumatic outflow valve.

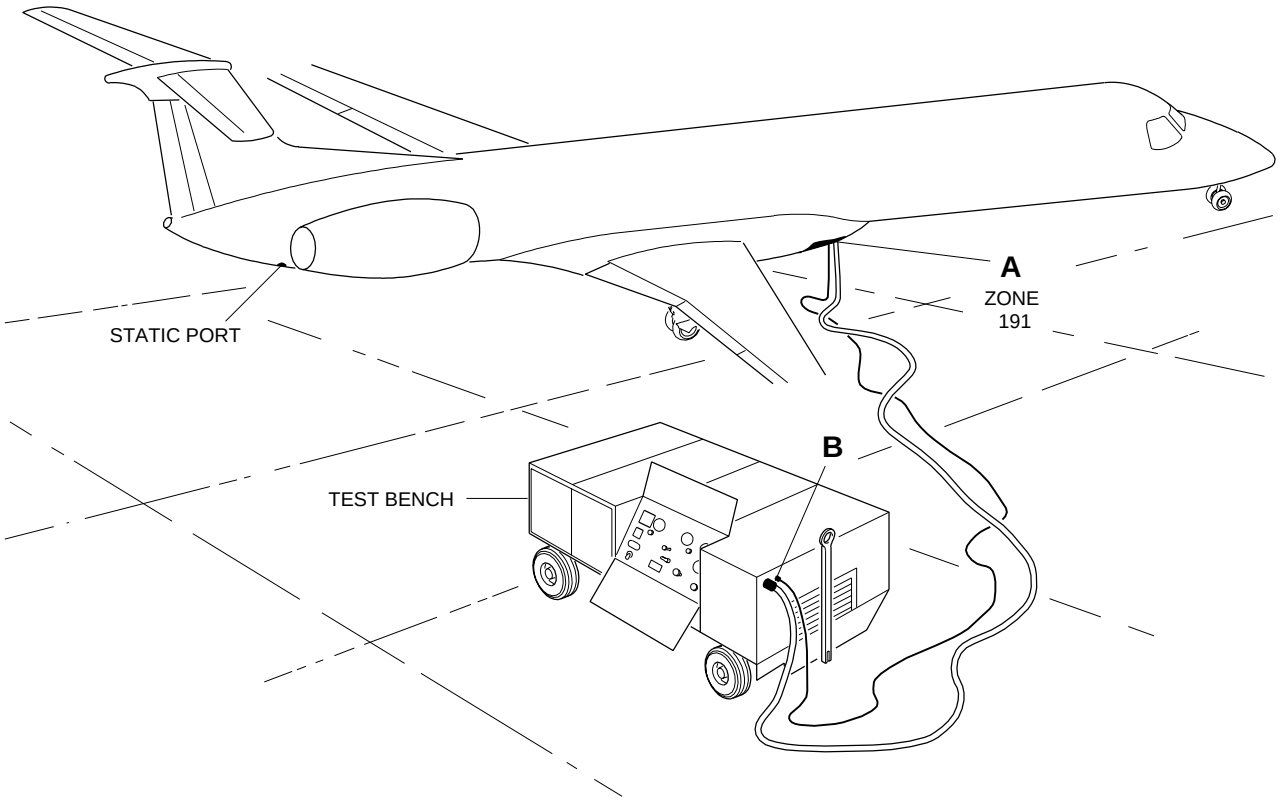
(5) Install access panel 272DR (AMM MPP 06-41-01/100).

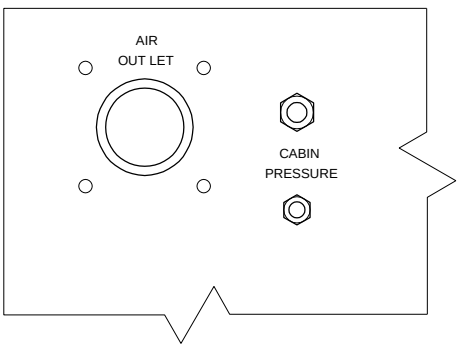
(6) On the CPCS digital controller, in the control pedestal, set the AUTO/MAN switch to the AUTO position (released).

(7) Make sure that the Manual Controller are set to DN position.

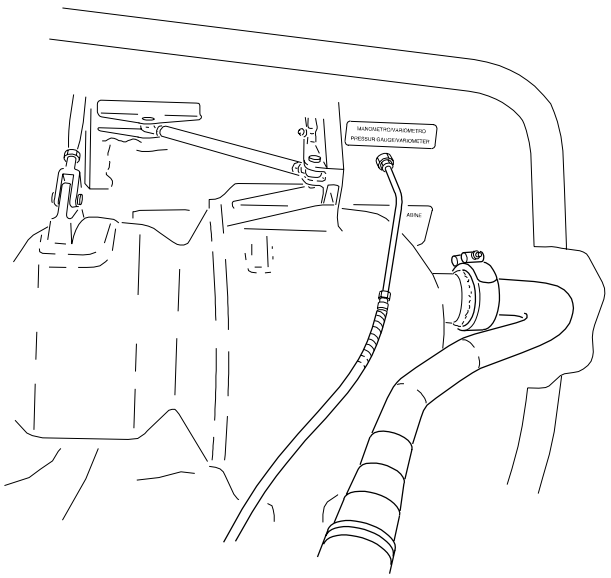
EFFECTIVITY: ACFT MODEL(S) EMB-145

Pressurization Test Bench Connection to Aircraft
Figure 504





DET. B



DET. A

145AMM210065.MCE B

TASK 21-31-00-700-806-A
EFFECTIVITY: ACFT MODEL(S) EMB-145

7. FUNCTIONAL TEST FOR LINE LEAKAGE

A. General

(1) For the line leak test, a compressed air source is necessary.

B. References

REFERENCE	*DESIGNATION*
AMM 06-43-01/101	-
AMM MPP 06-41-01/100	-
AMM TASK 21-31-02-000-801-A/400	MANUAL CONTROLLER - REMOVAL

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
191		Wing-to-fuselage fairing
272	272DR	Rear fuselage I
223	223QZ	Control pedestal

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Compressed air source with a minimum capacity of 20 psi, with a filter to protect against unwanted material	To supply air for the leak test	

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
AS5174D0504	Fitting	To connect the vacuum line to the reference pressure line	1
AS5168-D05	Plug	To seal the outflow valve tubes and vacuum pump outlet	AR
AS5168-D04	Plug	To seal the pressure regulating valve tubes	AR

F. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
MIL-L-25567	Leakage detection compound - Leak Tec 16 OX	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	On and outside the aircraft

I. Preparation

SUBTASK 841-054-B

(1) Remove access panels:

– 191 (AMM MPP 06-41-01/100)

– 223QZ (AMM 06-43-01/101)

– 272DR (AMM MPP 06-41-01/100)

J. Functionally Test Line for Leakage (Note: Applicable for Aircraft PRE-MOD SB 145-21-0002) (Figure 505)

SUBTASK 720-041-A

EFFECTIVITY: PRE-MOD SB 145-21-0002

(1) Remove the manual controller (AMM TASK 21-31-02-000-801-A/400).

(2) Connect the vacuum line (2) to the reference pressure line (1) with the fitting.

(3) Disconnect the tubes (3) from the pressure regulating valves and seal them with plugs.

(4) Remove the union from the vacuum pump outlet (4) and seal the outlet with a plug.

(5) Disconnect the vacuum tubes (5) from the electropneumatic and pneumatic outflow valves and seal them with plugs.

(6) Disconnect the reference pressure tube (6) from the pneumatic outflow valve and connect it to the compressed air source.

(7) Pressurize the line with 20 psi.

(8) Close the air supply and measure the pressure drop in the line.

NOTE: The pressure drop permitted in the line is 1 psi per minute.

(9) If a leakage is found, apply Leak Tec to all connections, repair the leaks, and do the test again.

(10) Disconnect the compressed air source.

(11) Remove the plugs and fittings.

(12) Connect the tubes to the outflow valves, pressure regulating valves, and manual controller, and reinstall the union to the vacuum pump outlet (4).

K. Functionally Check Line for Leakage (Note: Applicable for Aircraft POST-MOD SB 145-21-0002) (Figure 505)

SUBTASK 720-042-B

EFFECTIVITY: POST-MOD SB 145-21-0002

(1) Remove the manual controller (AMM TASK 21-31-02-000-801-A/400).

(2) Connect the vacuum line (2) to the reference pressure line (1) with the fitting.

(3) Disconnect the vacuum tubes (5) from the electropneumatic and pneumatic outflow valves and seal them with plugs.

(4) Disconnect the reference pressure tube (6) from the pneumatic outflow valve and seal it with plug.

(5) Remove the union from the vacuum pump outlet (4) and seal the outlet with a plug.

(6) Disconnect the tubes (3) from the pressure regulating valves.

(7) Connect a compressed air source to one of the tubes disconnected from the pressure regulating valves.

(8) Pressurize the line with 20 psi.

(9) Close the air supply and measure the pressure drop in the line.

NOTE: The permitted pressure drop in the line is 1 psi per minute.

(10) If a leakage is found, apply Leak Tec to all connections, repair the leaks, and do the test again.

(11) Disconnect the compressed air source.

(12) Connect the compressed air source to the other tube disconnected from the pressure regulating valve.

(13) Repeat steps (8) thru (11).

(14) Remove the plugs and fittings.

(15) Connect the tubes to the outflow valves, pressure regulating valves, and manual controller, and reinstall the union to the vacuum pump outlet (4).

L. Follow-on

SUBTASK 842-051-B

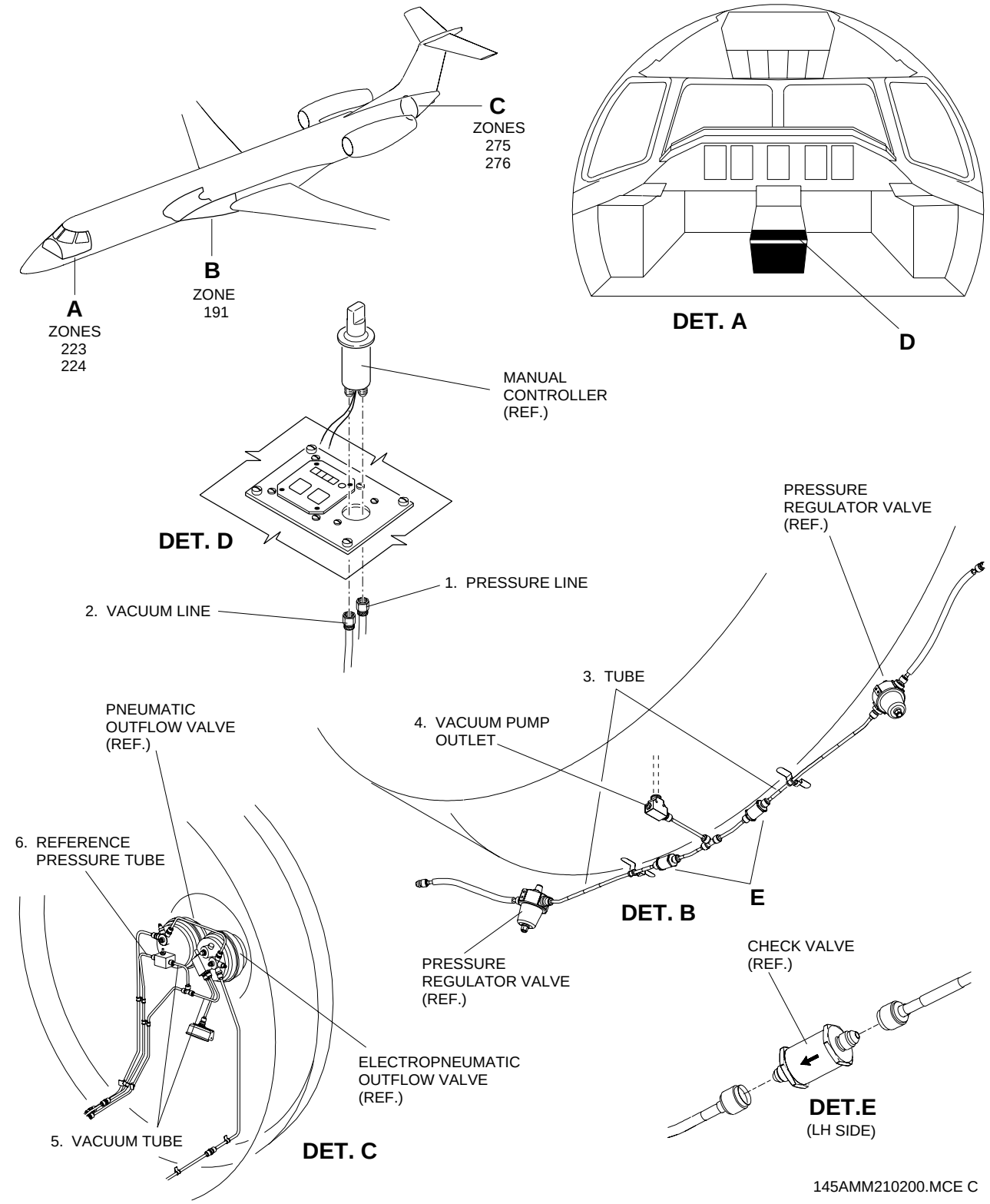
(1) Install access panels:

– 191 (AMM MPP 06-41-01/100)

– 223QZ (AMM 06-43-01/101)

– 272DR (AMM MPP 06-41-01/100)

EFFECTIVITY: ACFT MODEL(S) EMB-145
Functional Test for Line Leakage
Figure 505



145AMM210200.MCE C

TASK 21-31-00-700-807-A
EFFECTIVITY: ACFT MODEL(S) EMB-145

8. FUNCTIONAL TEST OF OVERPRESSURIZATION RELIEF DEVICES

A. General

(1) Do the test of the overpressurization relief devices with a pressurization test bench.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
191	191FR	Wing-to-fuselage fairing
272	272DR	Rear fuselage I

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
GSE 038	Pressurization Test Bench	To pressurize the aircraft	
GSE 037	Adapter - Cabin Pressurization Test	To permit the connection of the pressurization test bench to the aircraft	

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
AS5168-D05	Plug	To seal the reference pressure tube	1

F. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
Commercially available	Adhesive Tape	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	A - Does the task	Pressurization test bench
1	B - Helps technician A	Outflow valves

I. Preparation

SUBTASK 841-055-B

(1) Remove access panel 191FR (AMM MPP 06-41-01/100).

(2) Connect the test bench to the aircraft with the adapter.

(3) Remove access panel 272DR (AMM MPP 06-41-01/100).

(4) Disconnect the reference pressure tube from the pneumatic outflow valve and seal the tube with the plug.

(5) Install access panel 272DR (AMM MPP 06-41-01/100).

(6) On the CPCS digital controller, in the control pedestal, set the AUTO/MAN switch to the MAN position (pushed).

J. Test Procedure

SUBTASK 720-043-B

WARNING:
- **DO THE TEST IN AN OPEN AREA OR WITH THE HANGAR DOORS FULLY OPEN. USE A ROPE TO ISOLATE THE AREA WHERE THE AIRCRAFT IS, FOR SAFETY.**
- **DO NOT PERMIT PERSONS NEAR THE AIRCRAFT OR ON IT, SPECIALLY NEAR THE DOORS AND EMERGENCY EXITS.**
- **DO NOT OPEN THE DOORS DURING THE TEST.**

NOTE: Do not do the functional test of the overpressurization relief devices of the two valves together. The static port of the valve which is not under test must be blocked with adhesive tape.

(1) Pressurize the aircraft with a rate below 5000 ft/min, until the test-bench pressure gauge shows a differential pressure of 7.8 psi.

NOTE: For the operation of the pressurization test bench, refer to the test-bench manufacturer's manual.

(2) Set the test bench as necessary to stabilize the cabin at that pressure (rate of climb = zero).

(3) Cover the RH static port (related to pneumatic outflow valve) with adhesive tape.

WARNING: IF THE RELIEF VALVE DOES NOT OPEN AT THE VALUE SPECIFIED, DO NOT PERMIT THE CABIN PRESSURE TO BE MORE THAN 10.9 PSI.

(4) Pressurize the cabin until the electropneumatic outflow valve opens and measure this value.

NOTE:
- The pressure value specified for the relief device opening is 8.1 ± 0.1 psi. The relief device of the valve which does not open at the specified value must be replaced.
- In this test, the pneumatic outflow valve will also open.

(5) Release the cabin pressure until the electropneumatic outflow valve is fully closed.

(6) Remove the adhesive tape from the RH static port.

(7) Do the test again for the pneumatic outflow valve.

NOTE: For this test, put the adhesive tape on the LH static port (related to the electropneumatic outflow valve).

(8) Release the cabin pressure with a maximum outflow rate of 5000 ft/min.

K. Follow-on

SUBTASK 842-052-B

(1) Disconnect the test bench and the adapter from the aircraft.

(2) Install access panel 191FR (AMM MPP 06-41-01/100).

(3) Remove access panel 272DR (AMM MPP 06-41-01/100).

(4) Remove the plug and connect the reference pressure tube to the pneumatic outflow valve.

(5) Install access panel 272DR (AMM MPP 06-41-01/100).

(6) On the CPCS digital controller, in the control pedestal, set the AUTO/MAN switch to the AUTO position (released).

(7) Set the Manual Controller to DN position.

TASK 21-31-00-700-808-A
EFFECTIVITY: ACFT MODEL(S) EMB-145

9. FUNCTIONAL TEST FOR CABIN LEAKAGE WITH AIR BLED FROM THE ENGINE OR APU

A. General

(1) For this procedure, the cabin is pressurized with air bleed from the engine or APU. The values of pressure drop as a function of time are compared with a cabin decompression profile.

B. References

REFERENCE	*DESIGNATION*
AMM SDS 34-22-00/1	
AMM TASK 36-00-00-860-801-A/200	PNEUMATIC ENERGY - AIR BLEED THROUGH ONE OF THE ENGINES
AMM TASK 36-00-00-860-802-A/200	PNEUMATIC ENERGY - AIR BLEED THROUGH THE APU
AMM TASK 49-10-00-910-802-A/200	APU - START
AMM TASK 49-10-00-910-803-A/200	APU - SHUTDOWN
AMM TASK 49-13-00-910-802-A/200	APU - START
AMM TASK 49-13-00-910-803-A/200	APU - SHUTDOWN
AMM TASK 71-00-01-910-801-A/200	ENGINE START PROCEDURE (NORMAL)
AMM TASK 71-00-01-910-804-A/200	ENGINE STOP PROCEDURE

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Stopwatch	To measure the elapsed time	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Cockpit

I. Preparation

SUBTASK 841-057-B

(1) Make sure that the equipment and instruments which use static and dynamic pressures are installed. If not, make sure that the static and dynamic pressure lines are correctly sealed with plugs.

(2) Close all doors and windows of the aircraft.

(3) Set the controls below as follows:

– AUTO/MAN digital controller - MAN

– Manual Controller - UP

(4) Set the MFD to the ECS/ICE system page (AMM SDS 34-22-00/1).

(5) Start one of the engines (AMM TASK 71-00-01-910-801-A/200) or Start the APU (AMM TASK 49-10-00-910-802-A/200 for APU T-62T-40C11 or AMM TASK 49-13-00-910-802-A/200 for APU T-62T-40C14).

(6) Supply the pneumatic energy through the engine (AMM TASK 36-00-00-860-801-A/200) or through the APU (AMM TASK 36-00-00-860-802-A/200).

J. Functional Test of Cabin for Leakage (Figure 506) (Figure 507)

SUBTASK 720-045-B

WARNING: PERSONS WHO WILL STAY ON THE AIRCRAFT DURING THE TEST MUST BE IN GOOD HEALTH CONDITION. IF A PERSON FEELS PAIN IN THE EARS DURING PRESSURE CHANGES: THE PRESSURE MUST BE IMMEDIATELY MADE STABLE AND DECREASED UNTIL THE PERSON COME BACK TO NORMAL OR IS REMOVED FROM THE AIRCRAFT.

(1) Set the PACK 1 and PACK 2 switches to ON.

(2) Control the cabin temperature to approximately 21.1°C (70°F).

(3) Stop until the air conditioning system is stable.

(4) Set the manual controller to a rate of descent of approximately − 500 ft/min.

NOTE: Read the cabin altitude rate of descent shown on the EICAS display.

WARNING: THE DIFFERENTIAL PRESSURE MUST NOT BE MORE THAN 4.5 PSI.

(5) Pressurize the aircraft until you have a 4.2 psi differential pressure.

(6) Set the manual controller selector to maximum DN and immediately turn off PACK 1 and PACK 2.

(7) When the differential pressure is at 4.0 psi, set the stopwatch.

(8) Stop the pneumatic energy supply (AMM TASK 36-00-00-860-801-A/200) or (AMM TASK 36-00-00-860-802-A/200).

(9) Write down the time measured, aircraft altitude, and cabin temperature at each 0.5 psi pressure drop until the 1.5 psi differential pressure value is got.

(10) Use Table 501 to get the ambient pressure for each aircraft altitude.

(11) For ambient pressure values not equal to 14.7 psi and/or cabin temperature values not equal to 21.1°C (70°F), correct the time measured as shown below:

(a) tc = tm ÷ (Fp x Tc), where:

1 tc = time corrected

2 tm = time measured (step 9)

3 Fp = pressure correction factor (Figure 506)

4 Tc = temperature correction factor (Figure 506)

(b) Refer to the example below:

1 tm = 300 s

2 Ambient pressure = 14.1 psi

3 Cabin temperature = 26.7°C (80°F)

4 Values found through Figure 506:

a Fp = 1.02

b Tc = 0.99

5 Thus:

a tc = 300 ÷ (1.02 x 0.99)

b tc = 297.09 s

(12) After the time values are corrected, plot the differential pressure values on the vertical line and the corrected time values on the horizontal line, in Figure 507.

(13) The aircraft cabin leak will be satisfactory if all points got are above the curve shown on the "Cabin Decompression Profile" chart, Figure 507.

NOTE: If the points got are below the curve, look for leakage through tubing passages, pack outlet ducts, control cables, riveting in general, doors, ground connection valve seal, fuselage drains, emergency exits, ram-air check valves, and windows.

Table 501 - AIRCRAFT ALTITUDE X AMBIENT PRESSURE

Aircraft Altitude (feet)	Ambient Pressure (psi)	Aircraft Altitude (feet)	Ambient Pressure (psi)	Aircraft Altitude (feet)	Ambient Pressure (psi)
0	14.7	2800	13.3	5600	12.0
100	14.6	2900	13.2	5700	11.9
200	14.6	3000	13.2	5800	11.9
300	14.5	3100	13.1	5900	11.8
400	14.5	3200	13.1	6000	11.8

Table 501 - AIRCRAFT ALTITUDE X AMBIENT PRESSURE (Continued)

Aircraft Altitude (feet)	Ambient Pressure (psi)	Aircraft Altitude (feet)	Ambient Pressure (psi)	Aircraft Altitude (feet)	Ambient Pressure (psi)
500	14.4	3300	13.0	6100	11.7
600	14.4	3400	13.0	6200	11.7
700	14.3	3500	12.9	6300	11.6
800	14.3	3600	12.9	6400	11.6
900	14.2	3700	12.8	6500	11.6
1000	14.2	3800	12.8	6600	11.5
1100	14.1	3900	12.7	6700	11.5
1200	14.1	4000	12.7	6800	11.4
1300	14.0	4100	12.6	6900	11.4
1400	14.0	4200	12.6	7000	11.3
1500	13.9	4300	12.6	7100	11.3
1600	13.9	4400	12.5	7200	11.3
1700	13.8	4500	12.5	7300	11.2
1800	13.8	4600	12.4	7400	11.2
1900	13.7	4700	12.4	7500	11.1
2000	13.7	4800	12.3	7600	11.1
2100	13.6	4900	12.3	7700	11.0
2200	13.6	5000	12.2	7800	11.0
2300	13.5	5100	12.2	7900	11.0
2400	13.5	5200	12.1	8000	10.9
2500	13.4	5300	12.1	8100	10.9
2600	13.4	5400	12.0	8200	10.8
2700	13.3	5500	12.0	8300	10.8

K. Follow-on

SUBTASK 842-054-B

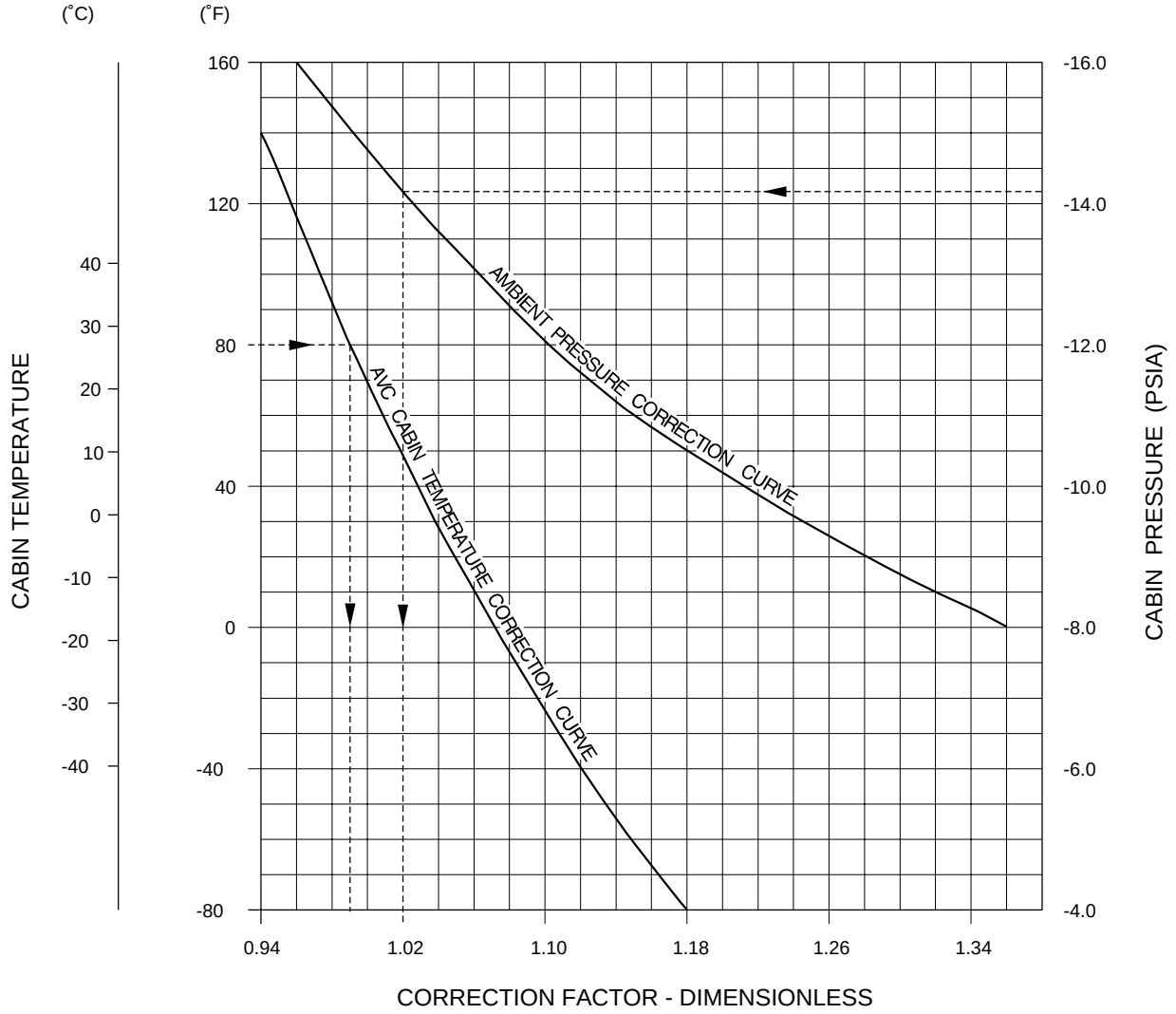
(1) Set the controls below as follows:

– AUTO/MAN digital controller - AUTO

– Manual Controller - DN

(2) Stop the engine (AMM TASK 71-00-01-910-804-A/200) or stop the APU (AMM TASK 49-10-00-910-803-A/200 for APU T-62T-40C11 or AMM TASK 49-13-00-910-803-A/200 for APU T-62T-40C14).

EFFECTIVITY: ACFT MODEL(S) EMB-145
Correction Factor - Dimensionless
Figure 506



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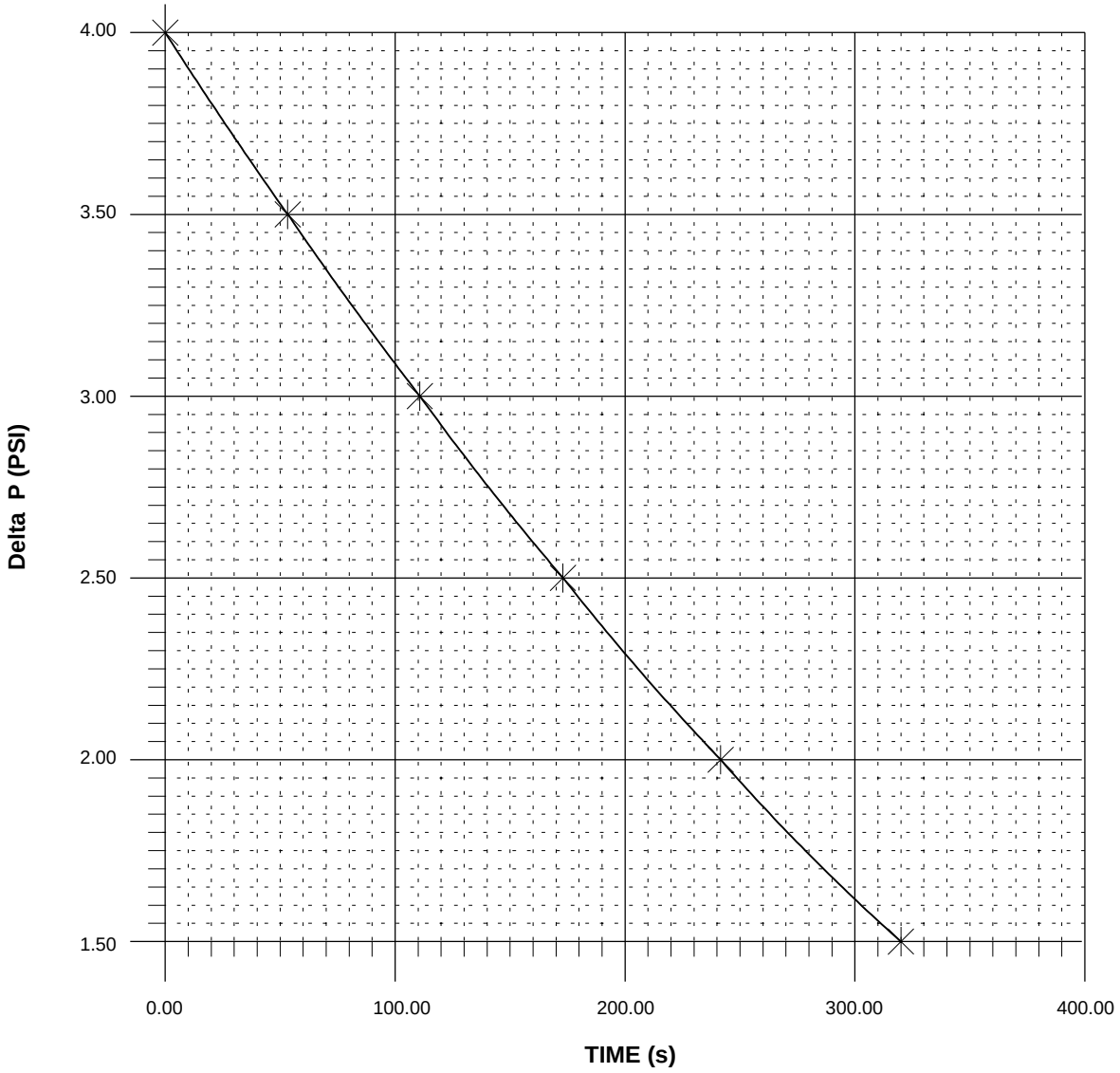
EFFECTIVITY: ACFT MODEL(S) EMB-145
Cabin Decompression Profile
Figure 507



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TASK 21-31-00-700-809-A
EFFECTIVITY: ACFT MODEL(S) EMB-145

10. FUNCTIONAL TEST OF OVERPRESSURIZATION RELIEF DEVICES WITH PITOT/STATIC SYSTEM TEST SET

A. General

(1) Do the test of the overpressurization relief devices with a pitot/static system test set (GSE 129).

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM SDS 34-52-00/1	

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
272	272DR	Rear fuselage I

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
GSE 128	Air Data Kit	To permit interface between GSE 129 and the aircraft	
GSE 129	Pitot/Stat System Test Set	To simulate altitude	

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Ladder	To get access to the outflow valves	1

F. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
Commercially available	Adhesive Tape	AR
Commercially available	Plastic	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	A - Does the task	Pressurization test bench

(Continued)

QTY	*FUNCTION*	*PLACE*
1	B - Helps technician A	Outflow valves

I. Preparation (Figure 508)

SUBTASK 841-056-B

(1) On the circuit breaker panel, open these circuit breaker(s) and attach a DO-NOT-CLOSE tag to it (them):

- PRESS CONTROL (Location tip: DC BUS 1/AIR COND/PNEU/PRESS CONTROL).
- PITOT STATIC 1 (Location tip: DC BUS 1/ICE AND RAIN PROTECTION).
- PITOT STATIC 2(Location tip: DC BUS 2/ICE AND RAIN PROTECTION).

(2) Remove access panel 272DR (AMM MPP 06-41-01/100).

(3) Disconnect the interconnection tube (3) from the pneumatic and electropneumatic outflow valves.

(4) Cover the air filter (5) with a piece of plastic and adhesive tape.

J. Test Procedure (Figure 508)

SUBTASK 720-044-B

(1) Functional test of the overpressurization relief devices of the pneumatic outflow valve.

(a) Seal the overpressure port (1) with the plug (2).

(b) Connect the pitot/static system test set (GSE 129) (Figure 508) to pressurization static port 2.

NOTE: This procedure can cause interference with the local air traffic during simulations of altitude with the anemometric bench test. To prevent this, make sure that the transponder is on the STANDBY condition (AMM SDS 34-52-00/1).

(c) On the anemometric bench indication, read the current barometric pressure at the test field (local pressure) and write down the values.

(d) Set the pressure to create a vacuum with differential pressure according to the following steps:

NOTE: Climb rate limit maximum = 3.0 psi/min.

1. Step I: Set differential pressure to 7.9 psid.
   Verify valve position. Case the valve opens, replace the valve. Case valve remains close go to step (II).

2. Step II: Set differential pressure to 8.0 psid.
   Verify valve position. Case the valve open, go to step (e). Case valve remains close go to step (III).

3. Step III: Set differential pressure to 8.2 psid.

Verify valve position. Case the valve open, go to step (e). Case valve remains close, check the connections, visually check the static port tubes.

NOTE: The pressure value specified for the relief device opening is 8.1 ± 0.1 psi. Replace the relief device of the valve which does not open at the specified value.

(e) Set the bench to the test field altitude and wait until the altitude gets the field altitude.

(f) Remove the anemometric test bench from pressurization static port 2.

(g) Remove the plug (2) of the overpressure port (1).

(2) Functional test of the overpressurization relief devices of the electropneumatic outflow valve.

(a) Seal the overpressure port (4) with the plug (2).

(b) Connect the pitot/static system test set (GSE 129) (Figure 508) to pressurization static port 1.

(c) On the anemometric bench indication, read the current barometric pressure at the test field (local pressure) and write down the values.

(d) Set the pressure to create a vacuum with differential pressure according to the following steps:

NOTE: Climb rate limit maximum = 3.0 psi/min.

1. Step I: Set differential pressure to 7.9 psid.
Verify valve position. Case the valve opens, replace the valve. Case valve remains close go to step (II).

2. Step II: Set differential pressure to 8.0 psid.
Verify valve position. Case the valve open, go to step (e). Case valve remains close go to step (III).

3. Step III: Set differential pressure to 8.2 psid.
Verify valve position. Case the valve open, go to step (e). Case valve remains close, check the connections, visually check the static port tubes.

NOTE: The pressure value specified for the relief device opening is 8.1 ± 0.1 psi. Replace the relief device of the valve which does not open at the specified value.

(e) Set the bench to the test field altitude and wait until the altitude gets the field altitude.

(f) Remove the anemometric test bench from pressurization static port 1.

(g) Remove the plug (2) of the overpressure port (4).

K. Follow-on

SUBTASK 842-053-B

(1) Install the interconnection tube (3) from the pneumatic and electropneumatic outflow valves.

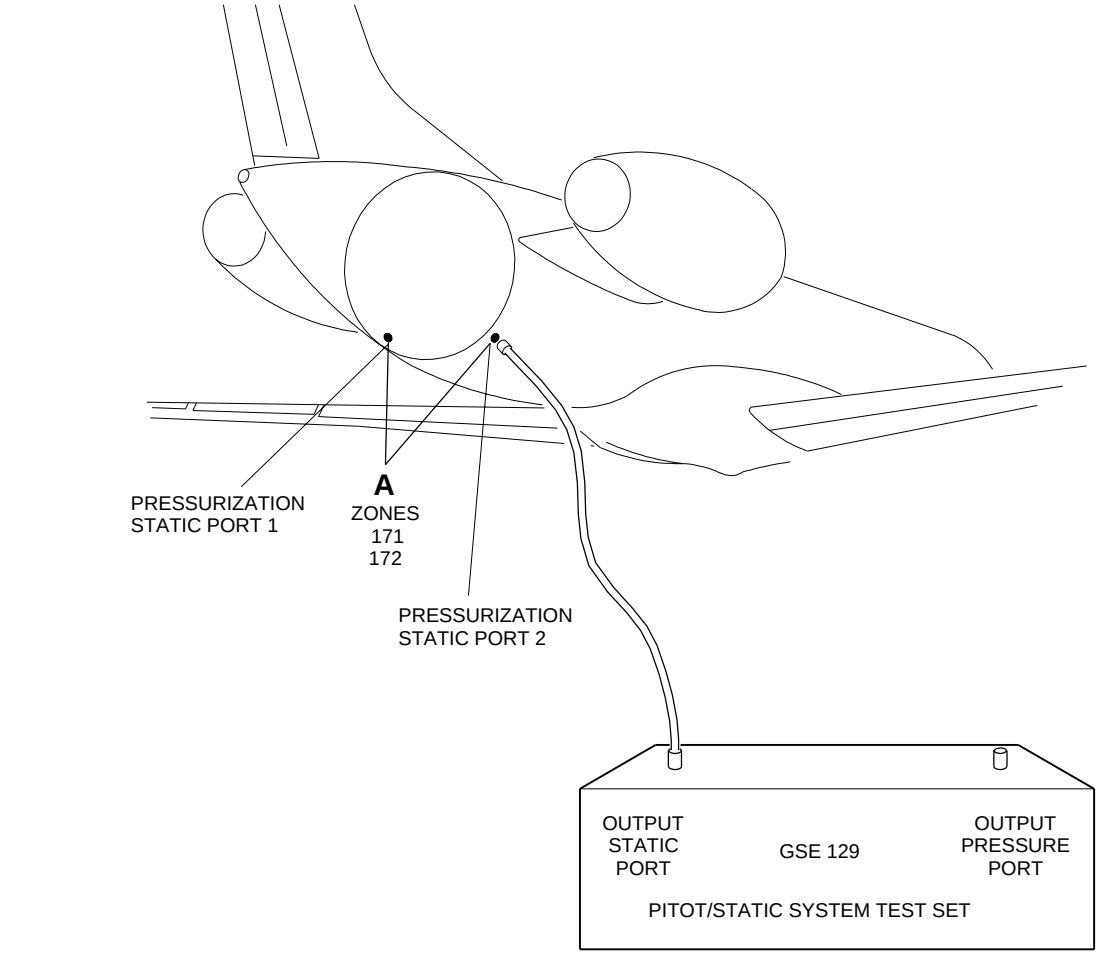
(2) Remove the adhesive tape and plastic from the air filter (5).

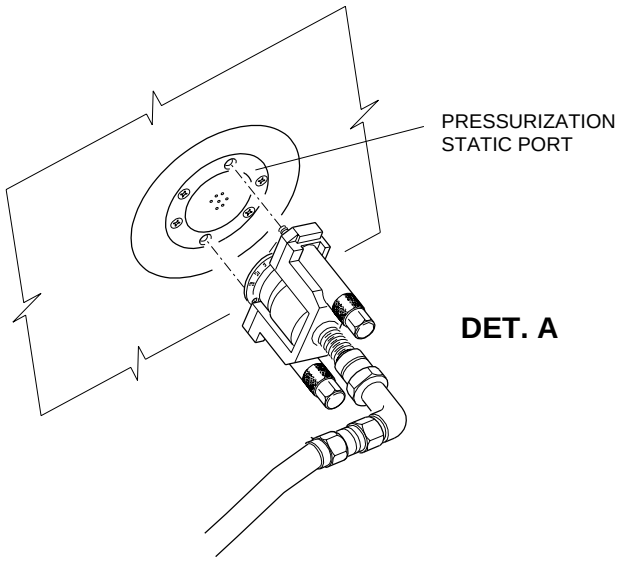
(3) Install access panel 272DR (AMM MPP 06-41-01/100).

(4) On the circuit breaker panel, close the circuit breaker(s) below and remove the DO-NOT-CLOSE tag from them:

- PRESS CONTROL (Location tip: DC BUS 1/AIR COND/PNEU/PRESS CONTROL).
- PITOT STATIC 1 (Location tip: DC BUS 1/ICE AND RAIN PROTECTION).
- PITOT STATIC 2(Location tip: DC BUS 2/ICE AND RAIN PROTECTION).

EFFECTIVITY: ACFT MODEL(S) EMB-145
Overpressurization Relief Devices - Functional Test
Figure 508 - Sheet 1





DET. A

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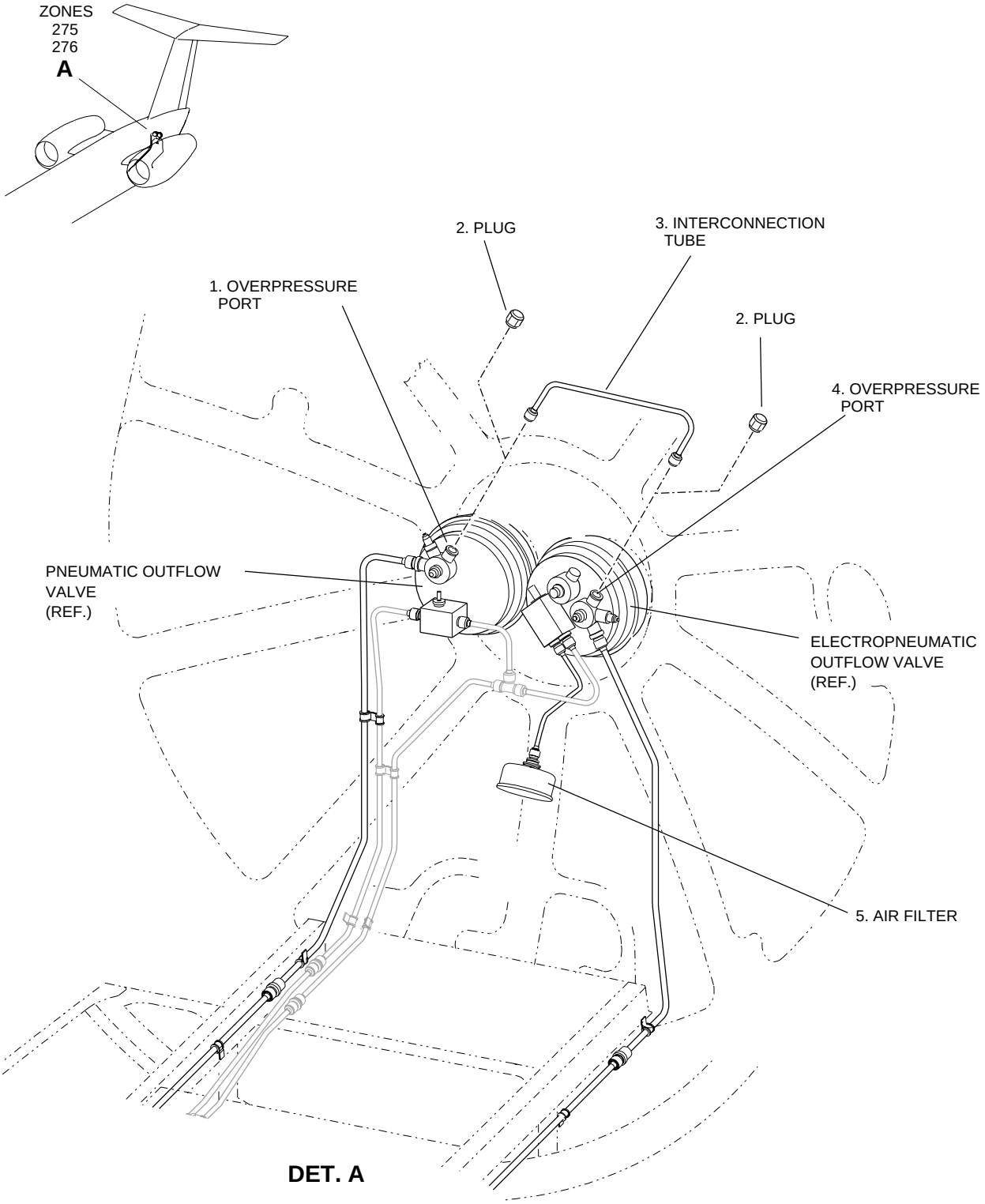
EFFECTIVITY: ACFT MODEL(S) EMB-145

Overpressurization Relief Devices - Functional Test
Figure 508 - Sheet 2



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