



EMB145 - EMB135

AIRCRAFT
MAINTENANCE MANUAL

FUEL TANKS - ADJUSTMENT/TEST

EFFECTIVITY: ALL

1. General

- A. This section gives two procedures to do a test of the fuel tanks for leaks:
- (1) Fueled-tank leak check (with leak location, evaluation, and classification).
 - (2) Defueled-tank leak check.
- 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
28-11-00-700-801-A	FUELED-TANK LEAK CHECK - OPERATIONAL CHECK	ACFT WITH WET WINGSTUB
28-11-00-700-802-A	DEFUELED-TANK LEAK CHECK - OPERATIONAL CHECK	ACFT WITH WET WINGSTUB
28-11-00-700-803-A	FUELED-TANK LEAK CHECK - OPERATIONAL CHECK	ACFT WITH DRY WINGSTUB
28-11-00-700-804-A	DEFUELED-TANK LEAK CHECK - OPERATIONAL CHECK	ACFT WITH DRY WINGSTUB
28-11-00-700-805-A ♦	WING FUEL TANK - BONDING TEST	ACFT WITH WET WINGSTUB
28-11-00-700-806-A ♦	WING FUEL TANK - BONDING TEST	ACFT WITH DRY WINGSTUB



AIRCRAFT MAINTENANCE MANUAL

TASK 28-11-00-700-801-A

EFFECTIVITY: ACFT WITH WET WINGSTUB

2. FUELED-TANK LEAK CHECK - OPERATIONAL CHECK

A. General

- (1) The function of this test is to identify the wing integral-fuel-tank leaks that are a flight safety hazard (and thus, must be repaired immediately) and leaks that can only be monitored until the subsequent scheduled maintenance is done. The leak location and the size of the wet area, in a given period of time, will permit you to make the separation between the two types of leaks. This test is done with the fuel tank full.

B. References

REFERENCE	DESIGNATION
AMM MPP 06-41-01/100	-
AMM MPP 06-44-00/100	- COMPONENT LOCATION
AMM MPP 28-00-00/200	- MAINTENANCE PRACTICES
AMM TASK 05-50-01-200-801-A/600	LIGHTNING STRIKE - GENERAL INSPECTION
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
AMM TASK 28-41-00-200-801-A/600	-
AMM TASK 57-56-01-000-801-A/400	INBOARD AND OUTBOARD FLAP LOWER SHROUDS - REMOVAL

C. Zones and Accesses

ZONE	PANEL/DOOR	LOCATION
192	192AL	Wing stub
192	192BR	Wing stub
551	551AB	LH Underwing surface
651	651AB	RH Underwing surface

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Ladder	To get access to the upper wing skin	1
Commercially available	Soft (cotton), lint-free cloths	To clean the leak area	AR

F. Consumable Materials

<i>SPECIFICATION (BRAND)</i>	<i>DESCRIPTION</i>	<i>QTY</i>
LD-4	Leak-Detection Powder, Talc based	AR
P-D-680 Type I	Solvent	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

<i>QTY</i>	<i>FUNCTION</i>	<i>PLACE</i>
1	Does the task	Upper/lower wing skin and wing stub undersurface (fuel tank)

I. Preparation

SUBTASK 841-002-A

WARNING: BEFORE YOU DO THE TASK, OBEY THE SAFETY PRECAUTIONS GIVEN IN AMM MPP 28-00-00/200 TO PREVENT INJURY TO PERSONS AND DAMAGE TO MATERIAL.

- (1) Energize the aircraft ([AMM TASK 20-40-01-860-801-A/200](#)).
- (2) Make sure that the wing tank is full.
- (3) Make sure that the aircraft is safe for maintenance.
- (4) Set the flaps to the 45-degree position.
- (5) On the circuit breaker panel, open the circuit breakers below and attach a DO-NOT-CLOSE tag to them:
 - APU CONTROL.
 - START 1/2.
 - FLAP 1.
 - FLAP 2.

CAUTION: WHEN YOU OPEN THE INBOARD-FLAP LOWER SHROUD, IF IT IS NECESSARY TO MOVE THE FLAPS, DO AS FOLLOWS (IT WILL PREVENT DAMAGE TO THE INBOARD-FLAP LOWER SHROUD AND INBOARD-FLAP LEADING EDGE):

- RELEASE THE SPRINGS FROM THE ROOT AND TIP SUPPORTS OF THE INBOARD-FLAP LOWER SHROUD.
- REMOVE THE TIP AND ROOT SUPPORTS ONLY FROM THE INBOARD-FLAP LOWER SHROUD ([AMM TASK 57-56-01-000-801-A/400](#)).

- (6) Open the inboard-flap lower shroud.

- (7) Put the ladder in the work area.
- (8) Remove the access panels shown below:
 - (a) Center lower fairing:
 - 192AL/192BR (AMM MPP 06-41-01/100).
 - (b) LH/RH Underwing area:
 - 551AB/651AB (AMM MPP 06-44-00/100).
- (9) Refer to the Scheduled Maintenance Requirements Document (SMRD - 145/1137) to do the inspection of the internal structural elements.

NOTE: This leak test procedure is only applicable when you are fully sure that the leak was caused by defects in the interface sealings or by loss of tightness in the fastener sealing.

J. Fueled-Tank Leak Check - Operational Check ([Figure 501](#))

SUBTASK 790-002-A

WARNING: • THE FUEL VAPORS ARE TOXIC AND CAN CAUSE IRRITATION TO THE SKIN AND EYES.

- WEAR MASK AND GLOVES NOT TO BREATHE FUEL VAPORS.
- DO NOT PERMIT THE AIR/FUEL MIXTURE TO COME TO AN EXPLOSIVE LEVEL. DO THE TEST IN AREAS WITH A GOOD FLOW OF AIR.

CAUTION: • LEAKS CAUSED BY A STRUCTURAL FAILURE MUST BE REPAIRED IMMEDIATELY AND BEFORE THE SUBSEQUENT FLIGHT.

- DO NOT PUT THE REMAINING CLEANING MATERIAL BACK INTO THE ORIGINAL CONTAINERS TO PREVENT CONTAMINATION.
- DO NOT POUR THE CLEANING PRODUCT DIRECTLY ON THE SURFACE TO BE CLEANED.
- DO NOT PERMIT THE CLEANING PRODUCT TO EVAPORATE BEFORE IT IS DRIED WITH THE CLOTH.

- (1) To find the leak area:

- (a) Do a good external visual inspection to make sure that there are no structural failures (for example, cracks and loose, broken, or lost fastener).
- (b) With cloths soaked in solvent, clean the area where you think there is a leak. Dry the area with clean cloths.
- (c) Apply regular powder to make it easier to find the point of external leakage and make an estimate of the leak extension.

NOTE: If, after the regular powder is applied, the accurate leak location is on the perimeter of the area cleaned, clean the area and apply the regular powder again for a better estimate of the leak.

(2) Leak estimate:

(a) Identify the leak location as follows:

1 Type I area - Exposed areas:

- a Areas with a good flow of air where leakage cannot go to a potential fire source. Upper and lower wing skin, but not the areas defined in type II.

2 Type II area - Areas subject to direct lightning strike:

- a Areas with a good flow of air where leakage cannot go to a possible fire source, and which are subject to a direct lightning strike ([AMM TASK 05-50-01-200-801-A/600](#)).

3 Type III area - Semi-enclosed areas:

- a Areas of spar II not fully open to a good flow of air where the leakage cannot go to a possible fire source.
- b Internal areas of the wing-to-fuselage fairings.

4 Type IV area - Closed areas:

- a Internal area of the wing tip fairing.
- b Wing stub (dry area).
- c Internal area of the wing leading edge.
- d Internal area of the aileron PCA.

NOTE: The estimate of fuel leak in the tank is necessary to identify leaks that are a flight safety hazard and, thus, must be repaired immediately and leaks that can only be monitored until the subsequent scheduled maintenance is done.

The size of the wet area and the leak location will permit you to make this estimate.

(b) After the regular powder is applied, identify type of the leaks by the size of the wet area, as follows ([Figure 501](#)):

1 Stain:

- a The area made moist by the leakage is not more than 40 mm (1 1/2 inch) at its largest dimension, 30 minutes after it was fully cleaned and the regular powder was applied. The fuel does not fall or flow off the surface.

2 Seepage:

- a The area made moist by the leakage is not more than 100 mm (4 inch) at its largest dimension, 30 minutes after it was fully cleaned and the regular powder was applied. The fuel does not fall or flow off the surface.

3 Heavy seepage:

- a** The area made moist by the leakage is not more than 150 mm (6 inch) at its largest dimension, 30 minutes after it was fully cleaned and the regular powder was applied. The fuel does not fall or flow off the surface.

4 Running leak:

- a** A leak larger than those specified above, in which the fuel comes into view again immediately after the cleaning.

The fuel falls or flows off the surface.

- (3) After the two classification types (by location and by size of wet area) are defined, use table 1 to identify the repair action.

Table 501

Leak location	Leak classification and repair action			
	Stain	Seepage	Heavy seepage	Running leak
Type I area	1	1	2	3
Type II area	2 **	2 **	4	4
Type III area	1 **	2 *	3	4
Type IV area	3	4	4	4

Notations:

* Limited to a maximum of 1 location.

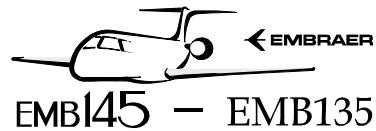
** Limited to a maximum of 2 locations.

1. No immediate repair action is necessary; frequent inspections must be done to make sure that the leak does not become larger. Daily checks are recommended.
2. No immediate repair action is necessary; frequent inspections must be done to make sure that the leak does not become larger. Daily checks are recommended. Repair action must be done in the subsequent A check to remove the problem.
3. Do not make the repairs until you are back to your main facility, if there is no indication of structural damage and the leak is not in a critical area (vapor formation area, ignition source area, and area subject to direct lightning strikes).
4. Immediate action is necessary.

K. Follow-on

SUBTASK 842-002-A

- (1) Clean the area where the powder was applied.
- (2) On the circuit breaker panel, close the circuit breakers below and remove the DO-NOT-CLOSE tag from them:
 - APU CONTROL.



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- START 1/2.
- FLAP 1.
- FLAP 2.

(3) Install the access panels shown below:

(a) LH/RH Underwing area:

- 551AB/651AB ([AMM MPP 06-44-00/100](#)).

(4) Do an inspection on the fuel quantity indication harness (AMM TASK 28-41-00-200-801-A/600).

NOTE: The inspection of fuel quantity indication harness is a part of Critical Design Configuration Control Limitations (CDCCL) in the Airworthiness Limitations of the Maintenance Review Board Report (MRB).

(5) Install the access panels shown below:

(a) Center lower fairing:

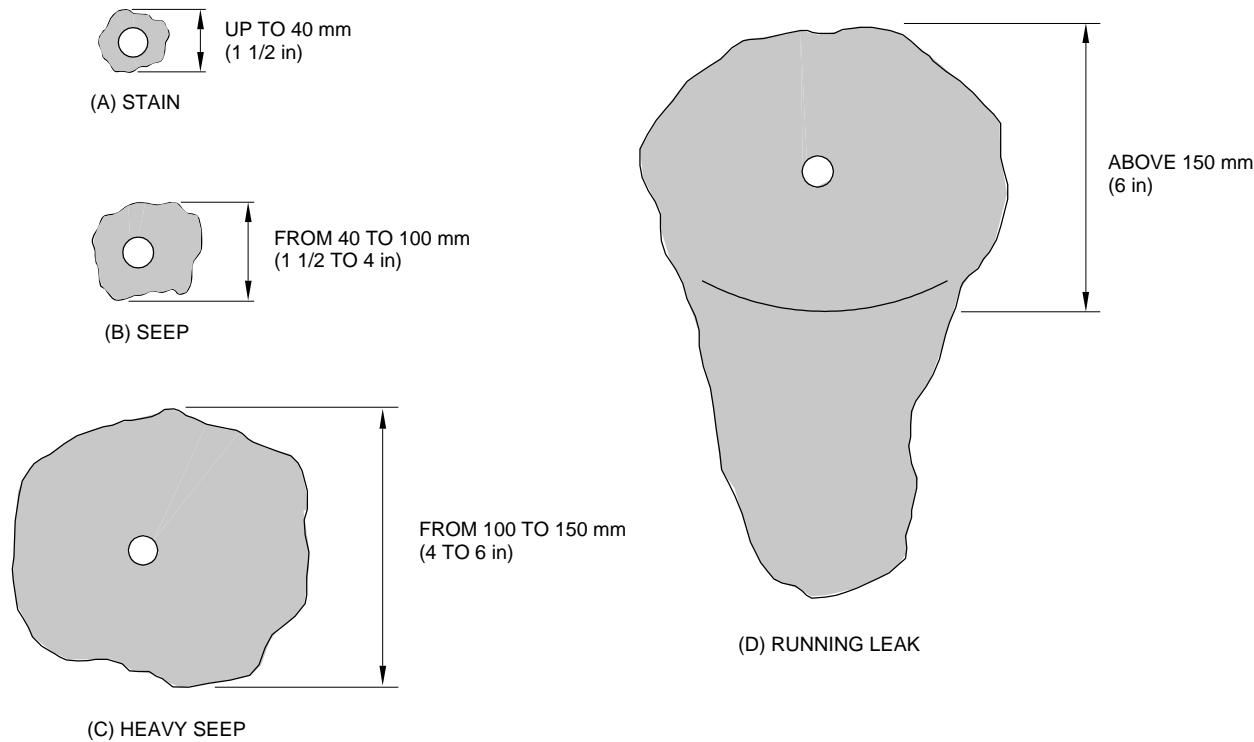
- 192AL/192BR (AMM MPP 06-41-01/100).

(6) Close the wing shroud.

(7) Remove the ladder from the work area.

(8) Set the flaps to UP position.

EFFECTIVITY: ACFT WITH WET WINGSTUB
 Leak Type Definition From the Size of the Wet Area
 Figure 501



TASK 28-11-00-700-802-A
EFFECTIVITY: ACFT WITH WET WINGSTUB
3. DEFUELED-TANK LEAK CHECK - OPERATIONAL CHECK
A. General

- (1) The function of this test is to give a method to do a check on the wing for leak after tank sealing repairs and before wing tank refueling. It also gives an alternative method to do the fueled-tank leak check when the wing tank is defueled. To do this test, pressurize the wing tank with dry and filtered compressed air and use leak detection fluid.

B. References

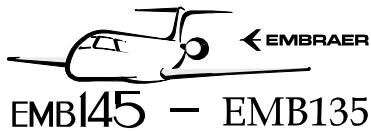
<i>REFERENCE</i>	<i>DESIGNATION</i>
AMM MPP 06-41-01/100	-
AMM MPP 06-44-00/100	- COMPONENT LOCATION
AMM MPP 28-00-00/200	- MAINTENANCE PRACTICES
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
AMM TASK 20-40-02-910-801-A/200	STATIC GROUNDING - STANDARD PRACTICES
AMM TASK 28-41-00-200-801-A/600	-

C. Zones and Accesses

<i>ZONE</i>	<i>PANEL/DOOR</i>	<i>LOCATION</i>
155	155DZ	LH landing gear bay
155	155EZ	LH landing gear bay
156	156DZ	RH landing gear bay
156	156EZ	RH landing gear bay
551	551AB	LH Underwing surface
651	651AB	RH Underwing surface

D. Tools and Equipment

<i>ITEM</i>	<i>DESCRIPTION</i>	<i>PURPOSE</i>	<i>QTY</i>
GSE 080	Leakage test box	To apply measured pressure to the tank	
GSE 086	Naca LH cover	To connect the hose assembly to the left tank	
GSE 104	Naca RH cover	To connect the hose assembly to the right tank	
GSE 115	Hose assembly	To connect the leakage test box to the shop air source	
GSE 116	Hose assembly	To connect the leakage test box to the Naca cover	



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E. Auxiliary Items

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Ladder	To get access to the upper wing skin	1
Commercially available	Brush	To apply the leak detector	1
Locally available	Dry and filtered compressed-air source	To pressurize the fuel tank	AR

F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
MIL-L-25567 or equivalent	LEAK TEC 160X (Leak detector)	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	Upper/lower wing skin and wing stub undersurface (fuel tank)

I. Preparation

SUBTASK 841-003-A

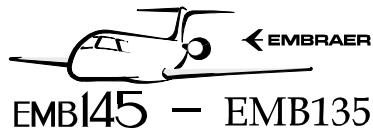
WARNING: BEFORE YOU DO THE TASK, OBEY THE SAFETY PRECAUTIONS GIVEN IN AMM MPP 28-00-00/200 TO PREVENT INJURY TO PERSONS AND DAMAGE TO MATERIAL.

- (1) Do the leakage test box (GSE 080) functional check:
 - (a) Inspect the test-box inlet filter for moisture and unwanted matter.
 - (b) Install a hose to connect the test-box LH side couplings (AIR OUTLET/MANOMETRIC PRESSURE).
 - (c) Turn the pressure regulator knob fully counterclockwise (-).
 - (d) Keep the pressure source selector at the CLOSE position.

CAUTION: MAKE SURE THAT THE REGULATOR KNOB IS FULLY CLOSED IN THE COUNTERCLOCKWISE POSITION BEFORE YOU CONNECT THE SHOP-AIR/BOTTLE INLET. IF YOU DO NOT OBEY THIS PROCEDURE DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (e) Connect the test box inlet to the compressed-air source.
- (f) Turn the test box source selector to the AIR position.

- (g) Move the test-box-operation selector lever to PRESSURE and turn the pressure regulator knob clockwise (+) until you have the reading of 2.5 ± 0.2 psi on the pressure gauge.
 - (h) Turn the source selector to the CLOSE position.
 - (i) Disconnect the compressed-air source from the test box.
 - (j) Push the operation selector lever to the ESCAPE position, until the pressure gauge shows zero.
- (2) Electrically ground the aircraft ([AMM TASK 20-40-02-910-801-A/200](#)).
- (3) Make sure that the wing tank is empty.
- (4) On the circuit breaker panel, open the circuit breakers below and attach a DO-NOT-CLOSE tag to them:
- APU CONTROL.
 - APU FIRE EXTG.
 - START 1/2.
 - FUEL PUMPS 1A/1B/1C.
 - FUEL PUMPS 2A/2B/2C.
 - FIRE EXTG BTL A 1/2.
 - FIRE EXTG BTL B 1/2.
- (5) Remove access panels 155DZ and 155EZ or 156DZ/156EZ (AMM MPP 06-41-01/100) to get access to the engine shut-off valves and the APU shut-off valve.
- (6) Energize the aircraft with the External Power Supply ([AMM TASK 20-40-01-860-801-A/200](#)).
- (7) Close the engine 1 or 2 (as applicable) shut-off valve as follows:
- (a) Pull the Engine 1 or 2 (as applicable) Fire Extinguishing Handles on the overhead panel.
Result:
 - 1 On the EICAS display, the “E1 FUEL SOV CLSD” or/and “E2 FUEL SOV CLSD” advisory message comes into view.
 - 2 Make sure that the position indicator, on engine 1 or 2 shut-off valves, shows the CLOSED position.
 - (b) On the circuit breaker panel, open the circuit breakers FUEL SOV 1 or/and 2 and attach a DO-NOT-CLOSE tag to them.
 - (c) Push the fire extinguishing handle back to the normal position.
- (8) Make sure that:
- (a) On the fuel control panel, the XFEED switch is in the OFF position.



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- (b) On the EICAS display, the FUEL XFEED OPEN advisory message is out of view.
 - (c) On the overhead panel, the APU master switch and the PUMP POWER switch are in the OFF position.
 - (d) The position indicator, on the fuel XFEED valve and on the APU shut-off valve, shows the CLOSED position.
- (9) Deenergize the aircraft ([AMM TASK 20-40-01-860-801-A/200](#)).
- (10) Put the ladder in the work area.
- (11) Remove access panel 551AB ([AMM MPP 06-44-00/100](#)) and install GSE 086 in its location, and/or remove access panel 651AB ([AMM MPP 06-44-00/100](#)) and install GSE 104 in its location, as applicable.
- NOTE: GSE 086 is used to do the leak check of the LH wing tank, and GSE 104 is used to do the leak check of the RH wing tank.
- (12) Install the hose assembly (GSE 116) to connect the test-box AIR OUTLET and MANOMETRIC PRESSURE couplings to the Naca cover (GSE 086 and/or GSE 104) couplings.
 - (13) Turn the test-box pressure regulator fully counterclockwise (-) and turn the test-box selector valve to the CLOSE position.

CAUTION: MAKE SURE THAT THE REGULATOR KNOB IS FULLY CLOSED IN THE COUNTERCLOCKWISE POSITION BEFORE YOU CONNECT THE SHOP-AIR/ BOTTLE INLET. IF YOU DO NOT OBEY THIS PROCEDURE DAMAGE TO THE EQUIPMENT CAN OCCUR.

CAUTION: OBEY THE MAXIMUM PRESSURE LIMIT SHOWN ON THE TEST BOX PLACARD.

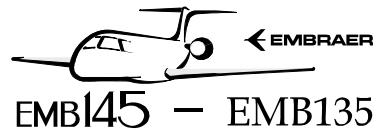
- (14) Connect the compressed-air source hose assembly (GSE 115) to the test box AIR INLET coupling.

J. Defueled-Tank Leak Check - Operational Check ([Figure 502](#)) ([Figure 503](#)) ([Figure 504](#))

SUBTASK 790-003-A

CAUTION: • TOO MUCH PRESSURE IN THE TANK CAUSES STRUCTURAL DAMAGE TO THE WING. OBEY THE SPECIFIED TEST PRESSURE VALUE (2.5 ± 0.2 PSI).
• IF THE APPLIED PRESSURE IS MORE THAN 4.5 PSI, THE WING MUST BE EXAMINED FOR STRUCTURAL DAMAGE.

- (1) Turn the test-box pressure-source selector to the AIR position.
- (2) Move the test box operation-selector lever to the PRESSURE position and turn the pressure knob clockwise (+), until the indication of 2.5 ± 0.2 psi is shown on the pressure gauge.
- (3) When the pressure stabilizes at 2.5 ± 0.2 psi, release the test box lever and turn the source selector to the CLOSE position.



NOTE: The pressure will decrease because there are connections with the opposite side. When the pressure decreases approximately 2.0 psi, do steps 2 and 3 above again, to keep the tank correctly pressurized during all the leak check.

- (4) After five minutes, do a check to make sure that the pressure becomes stable at this value.
- (5) With a brush, apply the leak detection fluid to the area(s) to be examined. Look for bubbles, specially at scaled and/or riveted joints.
- (6) If leaks are found, identify the related area(s).

NOTE: If, during the check, the pressure does not keep at the test value, apply pressure into the tank until you have the test value.

- (7) Move the test box lever to the ESCAPE position, until the pressure gauge shows zero.
- (8) If a leak is found, make the necessary repairs to the tank to remove the leak.
- (9) Do the check at the points where a rework was made.

NOTE: There must be NO leak.

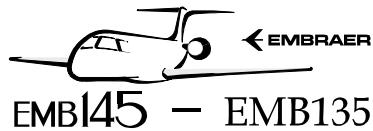
K. Follow-on

SUBTASK 842-003-A

- (1) Turn the test-box pressure regulator fully counterclockwise (-).
- (2) Disconnect the air-pressure supply hose from the test box.
- (3) Disconnect the hose assembly from the test box and from the special Naca cover.
- (4) Remove the Naca cover from the Naca air intake, and install access panels 551AB and/or 651AB ([AMM MPP 06-44-00/100](#)).
- (5) Do an inspection on the fuel quantity indication harness (AMM TASK 28-41-00-200-801-A/600).

NOTE: The inspection of fuel quantity indication harness is a part of Critical Design Configuration Control Limitations (CDCCL) in the Airworthiness Limitations of the Maintenance Review Board Report (MRB).

- (6) Install access panels 155DZ/155EZ or 156DZ/156EZ as applicable (AMM MPP 06-41-01/100).
- (7) Remove the ladder from the work area.
- (8) On the circuit breaker panel, close the circuit breakers below and remove the DO-NOT-CLOSE tag from them:
 - APU CONTROL.
 - APU FIRE EXTG.
 - START 1/2.
 - FUEL PUMPS 1A/1B/1C.

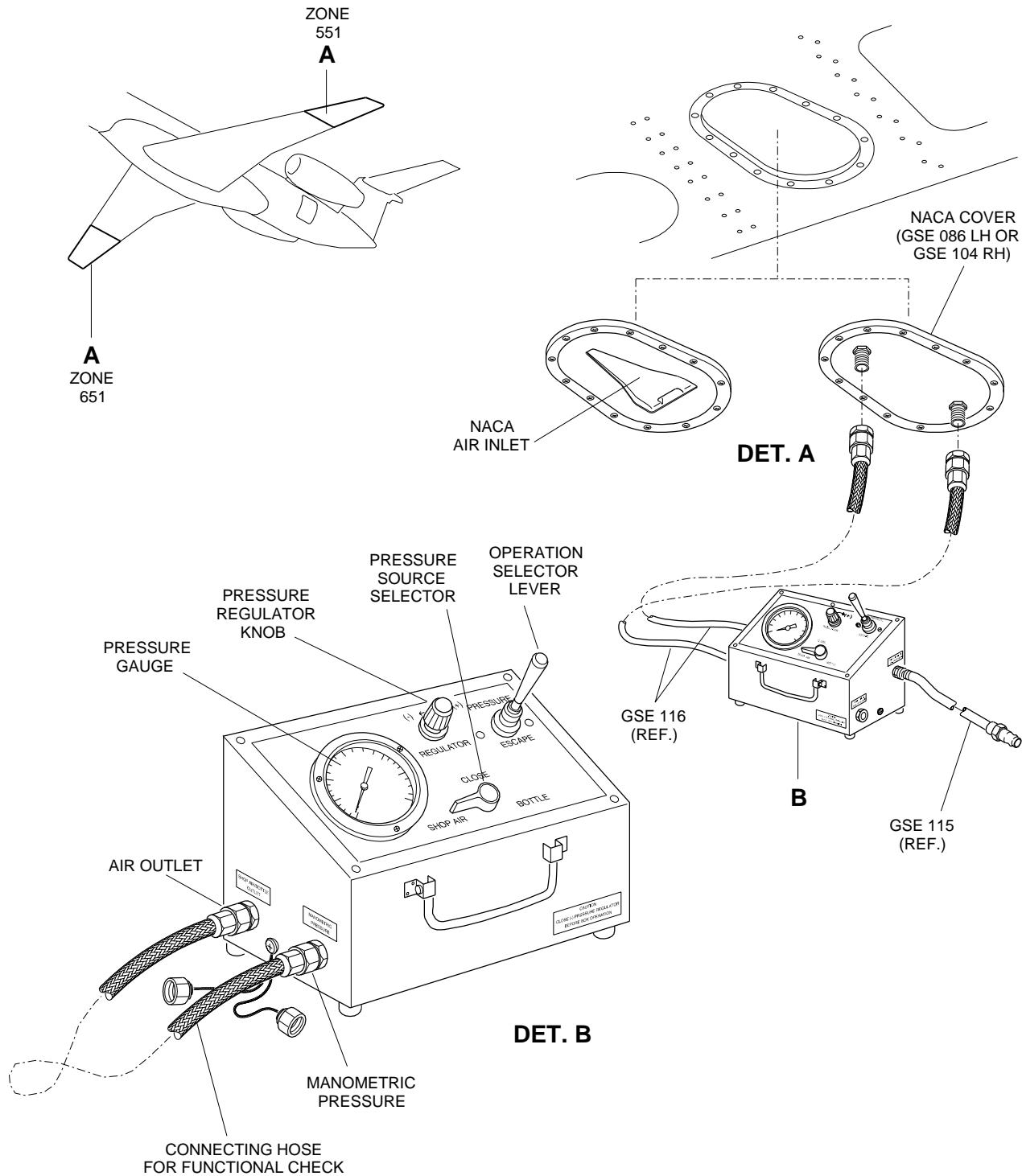


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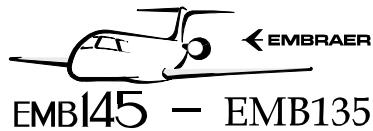
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- FUEL PUMPS 2A/2B/2C.
 - FIRE EXTG BTL A 1/2.
 - FIRE EXTG BTL B 1/2.
 - FUEL SOV 1/2.
- (9) Energize the aircraft with the External Power Supply ([AMM TASK 20-40-01-860-801-A/200](#)).
- (10) Make sure that, on the EICAS display, the “E1 FUEL SOV CLSD” and/or “E2 FUEL SOV CLSD” advisory message goes out of view.
- (11) Deenergize the aircraft ([AMM TASK 20-40-01-860-801-A/200](#)).

EFFECTIVITY: ACFT WITH WET WINGSTUB
Defueled Tank Leak Check
Figure 502

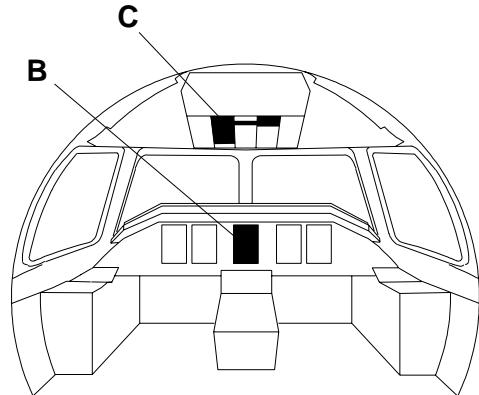
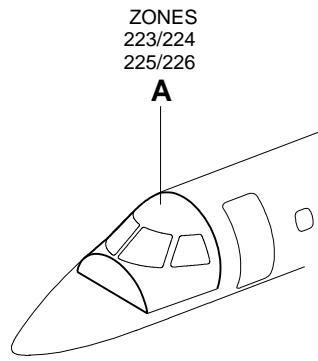


145AMM280115.MCE B

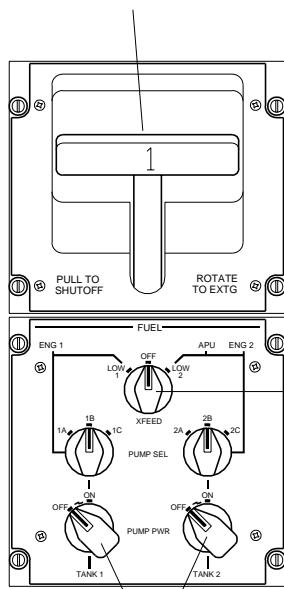


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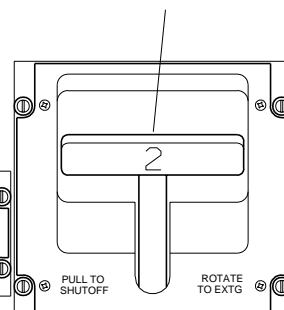
EFFECTIVITY: ACFT WITH WET WINGSTUB
Defueled Tank Leak Check
Figure 503



ENGINE 1 FIRE EXTINGUISHING HANDLE



ENGINE 2 FIRE EXTINGUISHING HANDLE



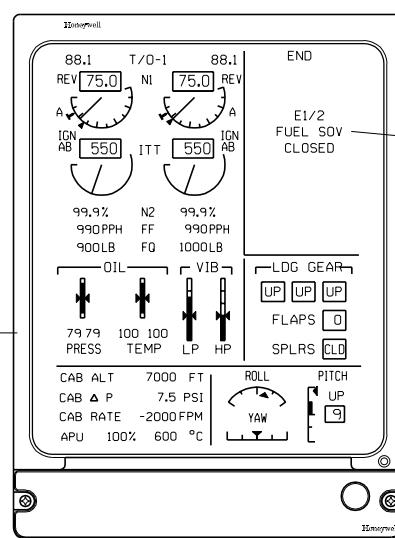
DET. A

DET. C

X FEED SWITCH

PUMP POWER SWITCH

EICAS DISPLAY



ADVISORY MESSAGE

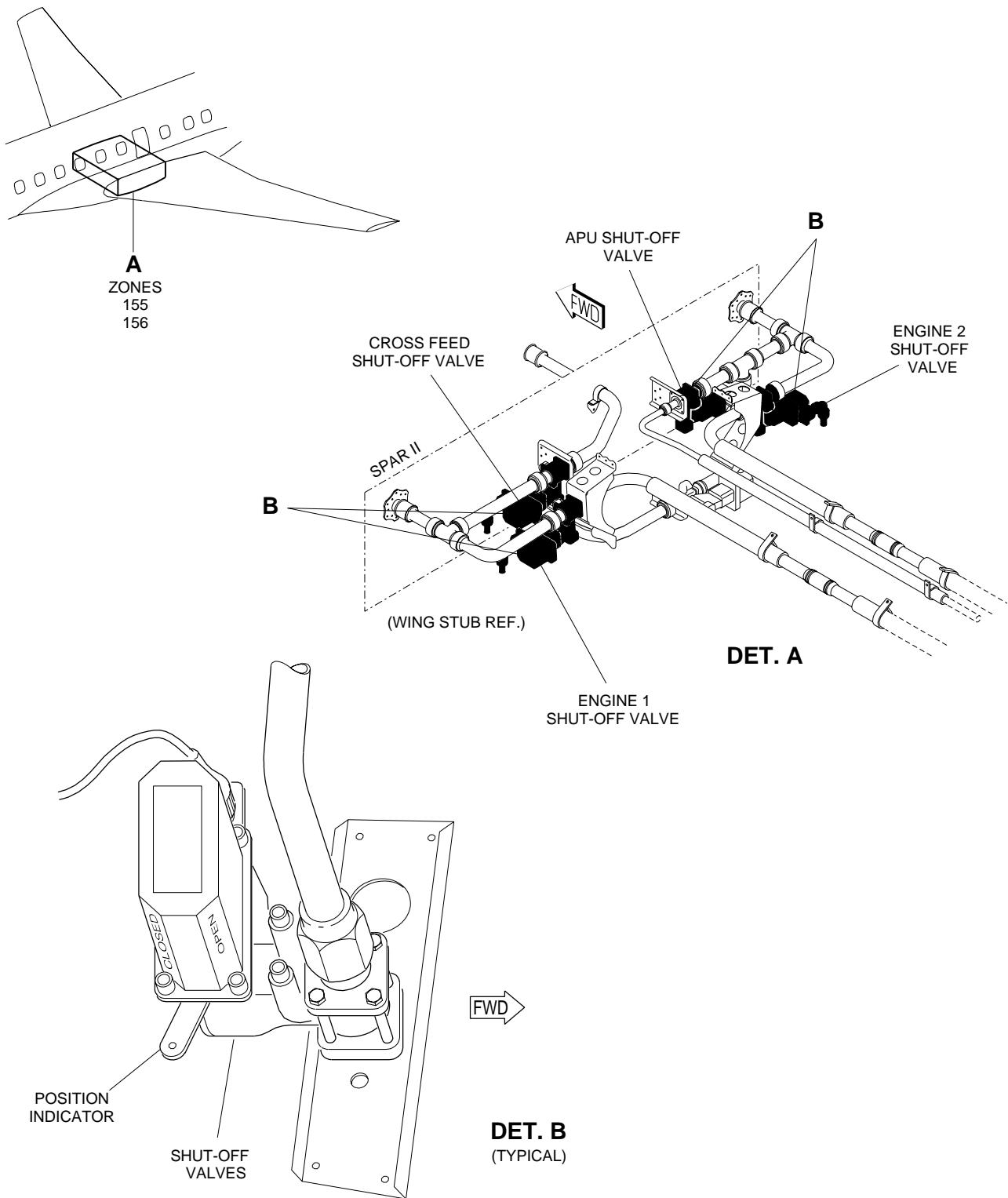
DET. B

145AMM280117.MCE A

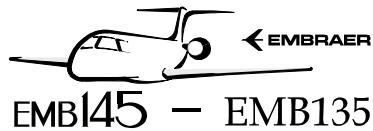
EFFECTIVITY: ACFT WITH WET WINGSTUB

Defueled Tank Leak Check

Figure 504



145AMM280148.MCE B



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TASK 28-11-00-700-803-A

EFFECTIVITY: ACFT WITH DRY WINGSTUB

4. FUELED-TANK LEAK CHECK - OPERATIONAL CHECK

A. General

- (1) The function of this test is to identify the wing integral-fuel-tank leaks, that are a flight safety hazard (and, thus, must be repaired immediately) and leaks that can only be monitored until the subsequent scheduled maintenance is done. The leak location and the size of the wet area, in a given period of time, will permit you to make the separation between the two types of leaks. This test is done with the fuel tank full.

B. References

REFERENCE	DESIGNATION
AMM MPP 06-41-01/100	-
AMM MPP 06-44-00/100	- COMPONENT LOCATION
AMM MPP 28-00-00/200	- MAINTENANCE PRACTICES
AMM TASK 05-50-01-200-801-A/600	LIGHTNING STRIKE - GENERAL INSPECTION
AMM TASK 28-41-00-200-801-A/600	-

C. Zones and Accesses

ZONE	PANEL/DOOR	LOCATION
192	192AL	Wing stub
192	192BR	Wing stub
551	551AB	LH Underwing surface
651	651AB	RH Underwing surface

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Ladder	To get access to the upper wing skin	1
Commercially available	Soft (cotton), lint-free cloths	To clean the leak area	AR

F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
LD-4	Leak-Detection Powder, Talc based	AR
P-D-680 Type I	Solvent	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

<i>QTY</i>	<i>FUNCTION</i>	<i>PLACE</i>
1	Does the task	Upper and lower wing skin (fuel tank)

I. Preparation

SUBTASK 841-004-A

WARNING: BEFORE YOU DO THE TASK, OBEY THE SAFETY PRECAUTIONS GIVEN IN AMM MPP 28-00-00/200 TO PREVENT INJURY TO PERSONS AND DAMAGE TO MATERIAL.

- (1) Make sure that the wing tank is full.
- (2) Open the wing shroud.
- (3) On the circuit breaker panel, open the circuit breakers below and attach a DO-NOT-CLOSE tag to them:
 - APU CONTROL.
 - START 1/2.
- (4) Put the ladder in the work area.
- (5) Remove the access panels shown below:
 - (a) Wing stub:
 - 192AL/192BR (AMM MPP 06-41-01/100).
 - (b) LH/RH Underwing area:
 - 551AB/651AB (AMM MPP 06-44-00/100).
- (6) Refer to the Scheduled Maintenance Requirements Document (SMRD - 145/1137) to do the inspection of the internal structural elements.

NOTE: This leak test procedure is only applicable when you are fully sure that the leak was caused by defects in the interface sealings or by loss of tightness in the fastener sealing.

J. Fueled-Tank Leak Check - Operational Check (Figure 501)

SUBTASK 790-004-A

WARNING: • **THE FUEL VAPORS ARE TOXIC AND CAN CAUSE IRRITATION TO THE SKIN AND EYES.**

- **WEAR MASK AND GLOVES NOT TO BREATHE FUEL VAPORS.**
- **DO NOT PERMIT THE AIR/FUEL MIXTURE TO COME TO AN EXPLOSIVE LEVEL. DO THE TEST IN AREAS WITH A GOOD FLOW OF AIR.**

- CAUTION:**
- LEAKS CAUSED BY A STRUCTURAL FAILURE MUST BE REPAIRED IMMEDIATELY AND BEFORE THE SUBSEQUENT FLIGHT.
 - DO NOT PUT THE REMAINING CLEANING MATERIAL BACK INTO THE ORIGINAL CONTAINERS TO PREVENT CONTAMINATION.
 - DO NOT POUR THE CLEANING PRODUCT DIRECTLY ON THE SURFACE TO BE CLEANED.
 - DO NOT PERMIT THE CLEANING PRODUCT TO EVAPORATE BEFORE IT IS DRIED WITH THE CLOTH.

(1) To find the leak area:

- (a) Do a good external visual inspection to make sure that there are no structural failures (for example, cracks and loose, broken, or lost fastener).
- (b) With cloths soaked in solvent, clean the area where you think there is a leak. Dry the area with clean cloths.
- (c) Apply leak detection powder to make it easier to find the point of exterior leakage and make an estimate of the leak extension.

NOTE: If, after the leak detection powder is applied, the accurate leak location is on the perimeter of the area cleaned, clean the area and apply the regular powder again for a better estimate of the leak.

(2) Leak estimate:

- (a) Identify the leak location as follows:

1 Type I area - Exposed areas:

- a Areas with a good flow of air where leakage cannot go to a potential fire source. Upper and lower wing skin, but not the areas defined in type II.

2 Type II area - Areas subject to direct lightning strike:

- a Areas with a good flow of air where leakage cannot go to a possible fire source, and which are subject to a direct lightning strike ([AMM TASK 05-50-01-200-801-A/600](#)).

3 Type III area - Semi-enclosed areas:

- a Areas of spar II not fully open to a good flow of air where the leakage cannot go to a possible fire source.

- b Internal area of the wing-to-fuselage fairings.

4 Type IV area - Closed areas:

- a Internal area of the wing tip fairing.

- b Wing stub undersurface.

- c Internal area of the wing leading edge.

- d Internal area of the aileron PCA.

NOTE: The estimate of fuel leak in the tank is necessary to identify leaks that are a flight safety hazard and, thus, must be repaired immediately and leaks that can only be monitored until the subsequent scheduled maintenance is done.

The size of the wet area and the leak location will permit you to make this estimate.

- (b) After the regular powder is applied, identify the type of the leaks by the size of the wet area, as follows (Figure 501):

1 Stain:

- a The area made moist by the leakage is not more than 40 mm (1 1/2 inch) at its largest dimension 30 minutes after it was fully cleaned and the regular powder was applied. The fuel does not fall or flow off the surface.

2 Seepage:

- a The area made moist by the leakage is not more than 100 mm (4 inch) at its largest dimension 30 minutes after it was fully cleaned and the regular powder was applied. The fuel does not fall or flow off the surface.

3 Heavy seepage:

- a The area made moist by the leakage is not more than 150 mm (6 inch) at its largest dimension 30 minutes after it was fully cleaned and the regular powder was applied. The fuel does not fall or flow off the surface.

4 Running leak:

- a A leak larger than those specified above, in which the fuel comes into view again immediately after the cleaning.

The fuel falls or flows off the surface.

- (3) After the two classification types (by location and by size of wet area) are defined, use table 1 to identify the repair action.

Table 502

Leak location	Leak classification and repair action			
	Stain	Seepage	Heavy seepage	Running leak
Type I area	1	1	2	3
Type II area	2 **	2 **	4	4
Type III area	1 **	2 *	3	4
Type IV area	3	4	4	4

Notations:

* Limited to a maximum of 1 location.

** Limited to a maximum of 2 locations.

1. No immediate repair action is necessary; frequent inspections must be done to make sure that the leak does not become larger. Daily checks are recommended.
2. No immediate repair action is necessary; frequent inspections must be done to make sure that the leak does not become larger. Daily checks are recommended. Repair action must be done in the subsequent A check to remove the problem.
3. Do not make the repairs until you are back to your main facility if there is no indication of structural damage and the leakage is not in a critical area (vapor formation area, ignition source area, and area subject to direct lightening strikes).
4. Immediate action is necessary.

K. Follow-on

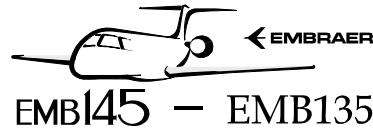
SUBTASK 842-004-A

- (1) Clean the area where the powder was applied.
- (2) On the circuit breaker panel, close the circuit breakers below and remove the DO-NOT-CLOSE tag from them:
 - APU CONTROL.
 - START 1/2.
- (3) Install the access panels shown below:
 - (a) LH/RH Underwing area:
 - 551AB/651AB ([AMM MPP 06-44-00/100](#)).

- (4) Do an inspection on the fuel quantity indication harness (AMM TASK 28-41-00-200-801-A/600).

NOTE: The inspection of fuel quantity indication harness is a part of Critical Design Configuration Control Limitations (CDCCL) in the Airworthiness Limitations of the Maintenance Review Board Report (MRB).

- (5) Install the access panels shown below:
 - (a) Wing stub:
 - 192AL/192BR (AMM MPP 06-41-01/100).
- (6) Close the wing shroud.
- (7) Remove the ladder from the work area.



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TASK 28-11-00-700-804-A

EFFECTIVITY: ACFT WITH DRY WINGSTUB

5. DEFUELED-TANK LEAK CHECK - OPERATIONAL CHECK

A. General

- (1) The function of this test is to give a method to do a check on the wing for leak after tank sealing repairs and before wing tank refueling. It also gives an alternative method for the fueled tank leak check when the wing tank is defueled. For this test, pressurize the wing tank with dry and filtered compressed air and use leak detection fluid.

B. References

REFERENCE	DESIGNATION
AMM MPP 06-41-01/100	-
AMM MPP 06-44-00/100	- COMPONENT LOCATION
AMM MPP 28-00-00/200	- MAINTENANCE PRACTICES
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
AMM TASK 20-40-02-910-801-A/200	STATIC GROUNDING - STANDARD PRACTICES
AMM TASK 28-41-00-200-801-A/600	-

C. Zones and Accesses

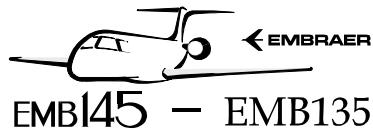
ZONE	PANEL/DOOR	LOCATION
192	192AL	Wing stub
192	192BR	Wing stub
551	551AB	LH Underwing surface
651	651AB	RH Underwing surface

D. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 080	Leakage test box	To apply measured pressure to the tank	
GSE 086	Naca LH cover	To connect the hose assembly to the left tank	
GSE 104	Naca RH cover	To connect the hose assembly to the right tank	
GSE 115	Hose assembly	To connect the leakage test box to the shop air source	
GSE 116	Hose assembly	To connect the leakage test box to the Naca cover	

E. Auxiliary Items

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Ladder	To get access to the upper wing skin	1



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(Continued)

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Brush	To apply the leak detector	1
Locally available	Dry and filtered compressed-air source	To pressurize the fuel tank	AR

F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
MIL-L-25567 or equivalent	LEAK TEC 160X (Leak detector)	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	Upper and lower wing skin (fuel tank)

I. Preparation

SUBTASK 841-005-A

WARNING: BEFORE YOU DO THE TASK, OBEY THE SAFETY PRECAUTIONS GIVEN IN AMM MPP 28-00-00/200 TO PREVENT INJURY TO PERSONS AND DAMAGE TO MATERIAL.

- (1) Do the leakage test box (GSE 080) functional check:
 - (a) Inspect the test box inlet filter for moisture and unwanted matter.
 - (b) Install a hose to connect the test box LH side couplings (AIR OUTLET/MANOMETRIC PRESSURE).
 - (c) Turn the pressure regulator knob fully counterclockwise (-).
 - (d) Keep the pressure source selector at the CLOSE position.

CAUTION: MAKE SURE THAT THE REGULATOR KNOB IS FULLY CLOSED IN THE COUNTERCLOCKWISE POSITION BEFORE YOU CONNECT THE SHOP-AIR/BOTTLE INLET. IF YOU DO NOT OBEY THIS PROCEDURE DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (e) Connect the test box inlet to the compressed-air source.
- (f) Turn the test box source selector to the AIR position.
- (g) Move the test box operation selector lever to PRESSURE and turn the pressure regulator knob clockwise (+) until you have the reading of 2.5 ± 0.2 psi on the pressure gauge.
- (h) Turn the source selector to the CLOSE position.

- (i) Disconnect the compressed-air source from the test box.
 - (j) Push the operation selector lever to the ESCAPE position until the pressure gauge shows zero.
- (2) Electrically ground the aircraft ([AMM TASK 20-40-02-910-801-A/200](#)).
- (3) Make sure that the fuel tank is empty.
- (4) On the circuit breaker panel, open the circuit breakers below and attach a DO-NOT-CLOSE tag to them:
- APU CONTROL.
 - APU FIRE EXTG.
 - START 1/2.
 - FUEL PUMPS 1A/1B/1C.
 - FUEL PUMPS 2A/2B/2C.
 - FIRE EXTG BTL A 1/2.
 - FIRE EXTG BTL B 1/2.
- (5) Remove access panels 192AL and 192BR (AMM MPP 06-41-01/100) to get access to the engine shut-off valves and the APU shut-off valve.
- (6) Energize the aircraft with the External Power Supply ([AMM TASK 20-40-01-860-801-A/200](#)).
- (7) Close the engine 1 or 2 (as applicable) shut-off valve as follows:
- (a) Pull the Engine 1 or 2 (as applicable) Fire Extinguishing Handles on the overhead panel.
Result:
 - 1 On the EICAS display, the “E1 FUEL SOV CLSD” or/and “E2 FUEL SOV CLSD” advisory message comes into view.
 - 2 Make sure that the position indicator, on engine 1 or 2 shut-off valves, shows the CLOSED position.
 - (b) On the circuit breaker panel, open the circuit breakers FUEL SOV 1 or/and 2 and attach a DO-NOT-CLOSE tag to them.
 - (c) Push the fire extinguishing handle back to the normal position.
- (8) Make sure that:
- (a) On the fuel control panel, the XFEED switch is in the OFF position.
 - (b) On the EICAS display, the FUEL XFEED OPEN advisory message is out of view.
 - (c) On the overhead panel, the APU master switch and the PUMP POWER switch are in the OFF position.

- (d) The position indicator, on the fuel cross-feed valve and on the APU shut-off valve, shows the CLOSED position.
- (9) Deenergize the aircraft ([AMM TASK 20-40-01-860-801-A/200](#)).
- (10) Put the ladder in the work area.
- (11) Remove access panel 551AB ([AMM MPP 06-44-00/100](#)) and install GSE 086 in its location, and/or remove access panel 651AB ([AMM MPP 06-44-00/100](#)) and install GSE 104 in its location, as applicable.
- NOTE:** GSE 086 is used to do the leak check of the LH wing tank, and GSE 104 is used to do the leak check of the RH wing tank.
- (12) Install the hose assembly (GSE 116) to connect the test-box AIR OUTLET and MANOMETRIC PRESSURE couplings to the Naca cover (GSE 086 and/or GSE 104) couplings.
- (13) Turn the test-box pressure regulator fully counterclockwise (-) and turn the test-box selector valve to the CLOSE position.

CAUTION: MAKE SURE THAT THE REGULATOR KNOB IS FULLY CLOSED IN THE COUNTERCLOCKWISE POSITION BEFORE YOU CONNECT THE SHOP-AIR/ BOTTLE INLET. IF YOU DO NOT OBEY THIS PROCEDURE DAMAGE TO THE EQUIPMENT CAN OCCUR.

CAUTION: OBEY THE MAXIMUM PRESSURE LIMIT SHOWN ON THE TEST BOX PLACARD.

- (14) Connect the compressed-air source hose assembly (GSE 115) to the test-box AIR INLET coupling.

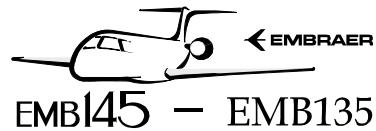
J. Defueled-Tank Leak Check - Operational Check ([Figure 505](#)) ([Figure 502](#)) ([Figure 503](#))

SUBTASK 790-005-A

CAUTION: • TOO MUCH PRESSURE IN THE TANK CAUSES STRUCTURAL DAMAGE TO THE WING. OBEY THE SPECIFIED TEST PRESSURE VALUE (2.5 ± 0.2 PSI).
• IF THE APPLIED PRESSURE IS MORE THAN 4.5 PSI, THE WING MUST BE EXAMINED FOR STRUCTURAL DAMAGE.

- (1) Turn the test box pressure-source selector to the AIR position.
- (2) Move the test box operation-selector lever to the PRESSURE position and turn the pressure knob clockwise (+) until the indication of 2.5 ± 0.2 psi is shown on the pressure gauge.
- (3) When the pressure stabilizes at 2.5 ± 0.2 psi, release the test box lever and turn the source selector to the CLOSE position.

NOTE: The pressure will decrease because there are connections with the opposite side. When the pressure decreases approximately 2.0 psi, do steps 2 and 3 above again, to keep the tank correctly pressurized during all the leak check.



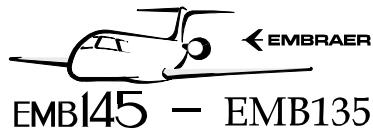
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- (4) After five minutes, do a check to make sure that the pressure becomes stable at this value.
- (5) With a brush, apply the leak detection fluid to the area(s) to be examined. Look for bubbles, specially at scaled and/or riveted joints.
- (6) If leaks are found, identify the related area(s).
NOTE: If, during the check, the pressure does not keep at the test value, apply pressure into the tank, until you have the test value.
- (7) Move the test box lever to the ESCAPE position, until the pressure gauge shows zero.
- (8) If a leak is found, make the necessary repairs to the tank to remove the leak.
- (9) Do the check at points where a rework was made.
NOTE: There must be no leak.

K. Follow-on

SUBTASK 842-005-A

- (1) Turn the pressure regulator knob fully counterclockwise (-).
- (2) Disconnect the air-pressure supply hose from the test box.
- (3) Disconnect the hose assembly from the test box and from the Naca cover.
- (4) Remove the Naca cover from the Naca air intake, and install access panels 551AB and/or 651AB ([AMM MPP 06-44-00/100](#)).
- (5) Do an inspection on the fuel quantity indication harness (AMM TASK 28-41-00-200-801-A/600).
NOTE: The inspection of fuel quantity indication harness is a part of Critical Design Configuration Control Limitations (CDCCL) in the Airworthiness Limitations of the Maintenance Review Board Report (MRB).
- (6) Install access panels 192AL/192BR (AMM MPP 06-41-01/100).
- (7) Remove the ladder from the work area.
- (8) On the circuit breaker panel, close the circuit breakers below and remove the DO-NOT-CLOSE tag from them:
 - APU CONTROL.
 - APU FIRE EXTG.
 - START 1/2.
 - FUEL PUMPS 1A/1B/1C.
 - FUEL PUMPS 2A/2B/2C.
 - FIRE EXTG BTL A 1/2.
 - FIRE EXTG BTL B 1/2.

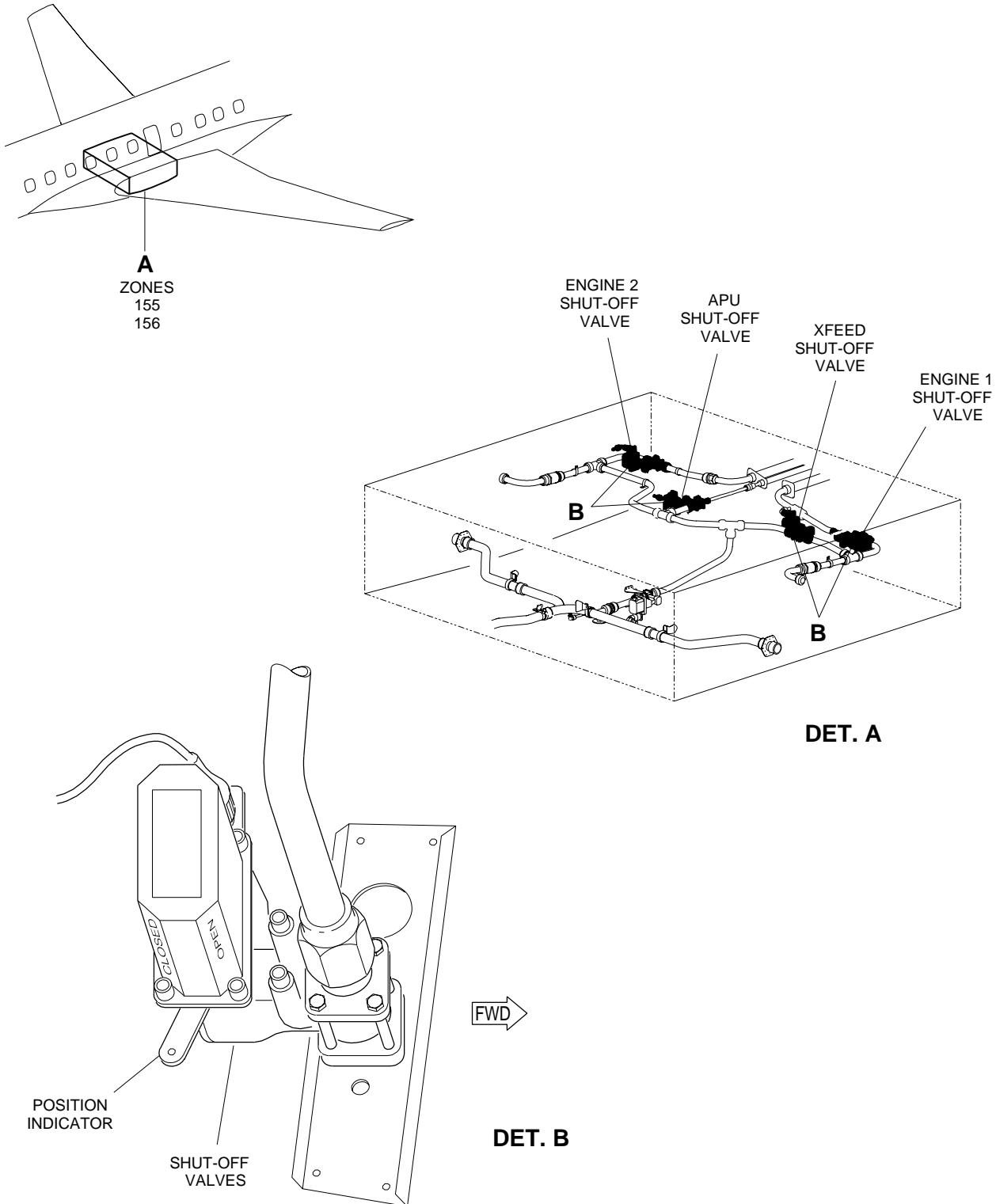


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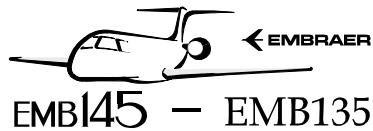
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MAINTENANCE MANUAL

- FUEL SOV 1/2.
- (9) Energize the aircraft with the External Power Supply ([AMM TASK 20-40-01-860-801-A/200](#)).
- (10) Make sure that, on the EICAS display, the “E1 FUEL SOV CLSD” and/or “E2 FUEL SOV CLSD” advisory message goes out of view.
- (11) Deenergize the aircraft ([AMM TASK 20-40-01-860-801-A/200](#)).

EFFECTIVITY: ACFT WITH DRY WINGSTUB
Defueled Tank Leak Check
Figure 505



145AMM280113.MCE B



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AIRCRAFT
MAINTENANCE MANUAL

TASK 28-11-00-700-805-A

EFFECTIVITY: ACFT WITH WET WINGSTUB

6. WING FUEL TANK - BONDING TEST

A. General

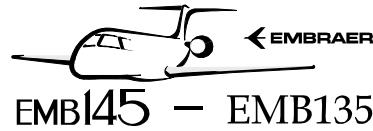
- (1) The function of this test is to do a check of bonding integrity at the fuel components in the fuel tank.

B. References

REFERENCE	DESIGNATION
AMM 28-21-01/401	-
AMM MPP 06-41-01/100	-
AMM MPP 06-44-00/100	- COMPONENT LOCATION
AMM MPP 12-11-01/300	- SERVICING
AMM MPP 20-13-21/200	- MAINTENANCE PRACTICES
AMM MPP 28-00-00/200	- MAINTENANCE PRACTICES
AMM MPP 28-11-01/400	- REMOVAL/INSTALLATION
AMM MPP 28-21-01/400	- REMOVAL/INSTALLATION

C. Zones and Accesses

ZONE	PANEL/DOOR	LOCATION
192	192AL	LH wing stub
192	192BR	RH wing stub
155	155NZ	LH wing stub
156	156NZ	RH wing stub
155	155BZ	LH wing stub
155	155CZ	LH wing stub
156	156BZ	RH wing stub
156	156CZ	RH wing stub
155	155DZ	LH wing stub
156	156DZ	RH wing stub
531	531AB	LH wing
531	531CB	LH wing
531	531DB	LH wing
541	541AB	LH wing
541	541DB	LH wing
631	631AB	RH wing
631	631CB	RH wing
631	631DB	RH wing
641	641AB	RH wing



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(Continued)

ZONE	PANEL/DOOR	LOCATION
641	641DB	RH wing

D. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 425	Milliohmometer	To measure the bonding values	

E. Auxiliary Items

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Brush	To apply the remover	AR
Commercially available	Soft (cotton) cloth	To clean the surface	AR
Commercially available	Acrylic Spatula	To clean the surface	1

F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
MEP-13-073	Rodhiasolve E-23, Solvent	AR
MEP-21-016	Ardrox 2871	AR
MIL-C-81706	Alodyne 1200S	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	FUNCTION	PLACE
2	Do the task	Wing Tank

I. Preparation

SUBTASK 841-006-A

- (1) Defuel and drain the aircraft ([AMM MPP 12-11-01/300](#)).

WARNING: BEFORE YOU DO THE TASK, OBEY THE SAFETY PRECAUTIONS GIVEN IN [AMM MPP 28-00-00/200](#) TO PREVENT INJURY TO PERSONS AND DAMAGE TO THE MATERIAL.

- (2) Open access panels (AMM MPP 06-41-01/100, [AMM MPP 06-44-00/100](#) and [AMM MPP 28-11-01/400](#)) shown below:

- (a) LH wing fuel tank:

- 192AL/155BZ/155CZ/155DZ/155NZ/531AB/531CB/531DB/541AB/541DB

- (b) RH wing fuel tank:
- 192BR/156BZ/156CZ/156DZ/156NZ/631AB/631CB/631DB/641AB/641DB

WARNING: • **MAKE SURE THAT THE AIRCRAFT IS DEENERGIZED**

- **VENTILATE THE TANKS TO DECREASE THE CONCENTRATION OF FUEL VAPORS.**
- **THE FRESH AIR FLOW FROM THE VENTILATION EQUIPMENT MUST KEEP THE FUEL VAPOR CONCENTRATION LEVELS INSIDE THE FUEL TANKS BELOW 10% LOWER EXPLOSIVE LIMITS (LEL).**
- **THE FRESH AIR FLOW FROM THE VENTILATION EQUIPMENT MUST KEEP THE OXYGEN LEVELS INSIDE THE FUEL TANKS BETWEEN 19.5 % AND 23.5% BY VOLUME.**

- (3) Do the preparation for an internal fuel tank maintenance procedure. Obey the instructions for Internal Fuel Tank Maintenance General Procedures ([AMM MPP 28-00-00/200](#)).
- J. Functionally Check critical bonding integrity of selected conduits inside the wing tank, Fuel Pump and FQIS connectors at tank wall by conductivity measurements. ([Figure 506](#)) ([Figure 507](#)) ([Figure 508](#))

SUBTASK 720-002-A

- (1) Put the milliohmometer (GSE 425) probe to the nearest ground point outside the tank and do a check for proper installation:
 - (a) Do a check to see if the probe is in contact to the grounding point.
 - (b) Measure the resistance between the ground point and one of the main frames of the aircraft. The measurement must be less than 2 mΩ.
- (2) Do the bonding test for the wing tank tubes:
 - (a) With soft (cotton) cloth, clean the point to be measured. Make sure that the point to be tested is dry.

WARNING: WHEN YOU DO THE ELECTRICAL BONDING TEST INSIDE THE TANK, YOU CAN CAUSE SPARKS. MAKE SURE THAT THE FUEL TANK IS COMPLETELY DRY AND THE FUEL VAPOR CONCENTRATION LEVELS INSIDE THE FUEL TANKS IS LESS THAN 10% LOWER EXPLOSIVE LIMITS (LEL).

CAUTION: DO NOT MARK, SCRATCH OR DAMAGE THESE ITEMS DURING THE MEASUREMENTS.

- (b) Put the test probe at the test point to measure the related resistance and do the electrical bonding test according to [Table 503](#) and [Figure 506](#). Do this test in the two wing tanks:

Table 503 - TUBING TEST POINTS

Test Point	Access Panel		Fuel Line	Maximum Value (mΩ)
	Left Tank	Right Tank		
1	531AB	631AB	Tank Vent Line	200
2	531CB	631CB	Tank Vent Line	200
3	531AB	631AB	Motive Flow Line	200
4	531CB	631CB	Motive Flow Line	200
5	531DB	631DB	Pilot Valve Line	200
6	541AB	541AB	Pilot Valve Line	200
7	541DB	541DB	Vent Valve Line	200

(c) The maximum resistance value must be less than the value given in Table 501. If the resistance value is greater than the value given in Table 501, do the corrective actions from step (1) to (8):

- 1 Replace the nearest bonding clamp of the applicable tube.
 - 2 With a clean cloth soaked with solvent RHODIASOLVE E-23, clean the faying surfaces between the applicable clamp and the tube and between the clamp and the clamp support. Before solvent RHODIASOLVE E-23 evaporates, dry these areas with a clean dry cloth.
 - 3 Do a visual inspection on the faying surfaces to make sure that there is no corrosion.
 - 4 With a clean cloth soaked with solvent RHODIASOLVE E-23, clean the bolts, washers and nuts, as applicable. Before solvent RHODIASOLVE E-23 evaporates, dry these items with a clean dry cloth.
- NOTE: Do not touch the surfaces after you clean them.
- 5 For tubes with Gamah couplings, replace gamah couplings. Make sure that the faying surfaces between the fuel tube and the Gamah couplings are clean.
 - 6 For tube with bonding jumpers installed, do the bonding procedure, method 7 ([AMM MPP 20-13-21/200](#))
 - 7 Do the electrical bonding test again.
 - 8 Do the bonding protection, as applicable ([AMM MPP 20-13-21/200](#)).
- (d) Repeat the step (2) for the opposite tank.

- (3) Get access to the LH and RH Electric Booster Pump connectors.
- (4) Do the electrical bonding test for the six fuel pump connectors:
 - (a) Disconnect the applicable fuel pump electrical connector
 - (b) With soft (cotton) cloth, clean the point to be measured. Make sure that the point to be tested is clean.
 - (c) Put the test probe at the applicable electrical connector ([Figure 507](#)).
 - (d) The maximum resistance value must be less than 15 mΩ. If the resistance value is greater than 15 mΩ, do the corrective actions from step 1 to 8:
 - 1 Remove the applicable fuel pump connector. Refer to AMM 28-21-01/401.
 - 2 Do a check to know if the hole for the electric fuel pump connector in the internal side of the fuel tank wall is prepared for bonding. If the electrical connector hole is not prepared, do steps from a to b ([Figure 507](#)). If the surface is prepared, go to step 3:

NOTE: The surface is prepared when it is without painting.

 - a Determine the area to be bonded:
 - 1) Do a mark around the hole for the electrical connector in the fuel tank wall. This mark must be 39 mm (1.53 inch) in diameter.
 - b Remove the nonconductive coating from the area to be bonded:
 - 1) Apply a brush soaked with remover Ardrox 2871.
 - 2) Remove coating with a spatula.

WARNING: DO NOT MIX ALODYNE WITH ORGANIC SOLVENTS (ALCOHOLS, KETONES, ETC.). WHEN YOU MIX ALODYNE AND ORGANIC SOLVENTS, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

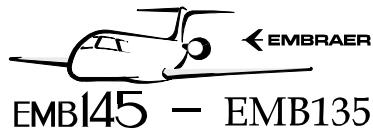
CAUTION: DO NOT PUT CLEANING CLOTHS, BRUSH, OR SPONGES INTO SOLVENT CONTAINER TO PREVENT SOLVENT CONTAMINATION. CONTAMINATED SOLVENT CAN CAUSE DAMAGE TO THE EQUIPMENT.

- 3 Clean the surface with a cloth soaked in solvent. Before the solvent evaporation, clean the surface with a clean dry cloth.
- 4 After cleaning, with a brush, apply a thin coat of Alodyne on the prepared surface and wait until the surface is amber.
- NOTE: The Alodyne 1200S solution pot life is 24 hours.
- 5 Clean the base of fuel pump connector with a cloth soaked in solvent. Before the solvent evaporation, clean the base of fuel pump connector with a clean dry cloth.

- 6 Install the fuel pump connector. Refer to [AMM MPP 28-21-01/400](#).
- 7 Do the electrical bonding test again.
- 8 Do the bonding protection at the connector ([AMM MPP 20-13-21/200](#)).
- (e) Connect the applicable fuel pump connector.
- (f) Do the bonding test for other fuel pump electrical connectors.
- (5) Get access to the LH and RH tank unit harness connectors.
- (6) Do the electrical bonding test for the two tank unit harness connectors ([Figure 508](#)):
 - (a) Disconnect the applicable tank unit harness connector
 - (b) With soft (cotton) cloth, clean the point to be measured. Make sure that the point to be tested is clean.
 - (c) Put the test probe at the applicable electrical connector.
 - (d) The maximum resistance value must be less than 15 mΩ. If the resistance value is greater than 15 mΩ, do the corrective actions from step 1 to 6:
 - 1 Remove the applicable tank unit harness connector.

WARNING: DO NOT MIX ALODYNE WITH ORGANIC SOLVENTS (ALCOHOLS, KETONES, ETC.). WHEN YOU MIX ALODYNE AND ORGANIC SOLVENTS, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

CAUTION: DO NOT PUT CLEANING CLOTHS, BRUSH, OR SPONGES INTO SOLVENT CONTAINER TO PREVENT SOLVENT CONTAMINATION. CONTAMINATED SOLVENT CAN CAUSE DAMAGE TO THE EQUIPMENT.
- 2 Clean the surface with a cloth soaked in solvent. Before the solvent evaporation, clean the surface with a clean dry cloth.
- 3 After cleaning, apply a thin coat of Alodyne on the prepared surface and wait until the surface is amber.
- NOTE: The Alodyne 1200S solution pot life is 24 hours.
- 4 Clean the base of tank unit harness connector with a cloth soaked in solvent. Before the solvent evaporation, clean the base of tank unit harness connector with a clean dry cloth.
- 5 Install the tank unit harness connector.
- 6 Do the electrical bonding test again.
- (e) Connect the applicable electrical connector.
- (f) Do the bonding protection ([AMM MPP 20-13-21/200](#)).



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- (g) Do the bonding test for the opposite side.

K. Follow-on

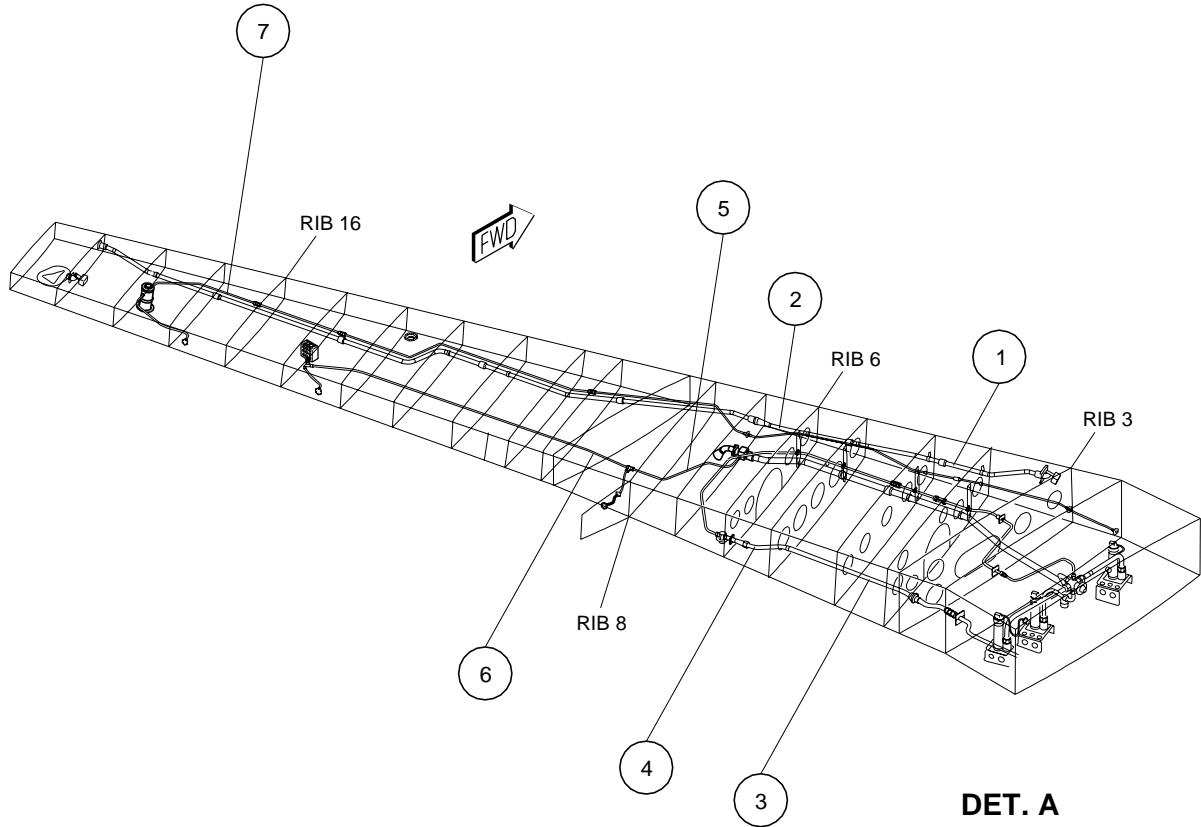
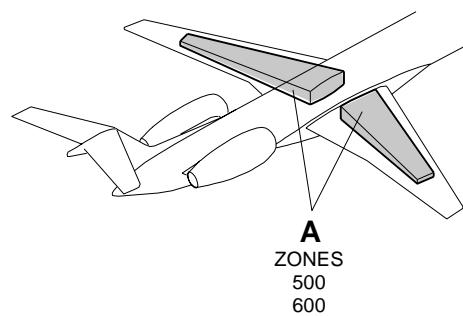
SUBTASK 842-006-A

- (1) Obey the instructions given in Internal Fuel Tank Maintenance General Procedures ([AMM MPP 28-00-00/200](#)).
- (2) Close access panels ([AMM MPP 06-44-00/100](#) and [AMM MPP 28-11-01/400](#)) shown below:
 - (a) LH wing fuel tank:
 - 192AL/155BZ/155CZ/155DZ/155NZ/531AB/531CB/531DB/541AB/541DB
 - (b) RH wing fuel tank:
 - 192BR/156BZ/156CZ/156DZ/156NZ/631AB/631CB/631DB/641AB/641DB

EFFECTIVITY: ACFT WITH WET WINGSTUB

Tubes - Bonding Test (Refer to Table 503)

Figure 506

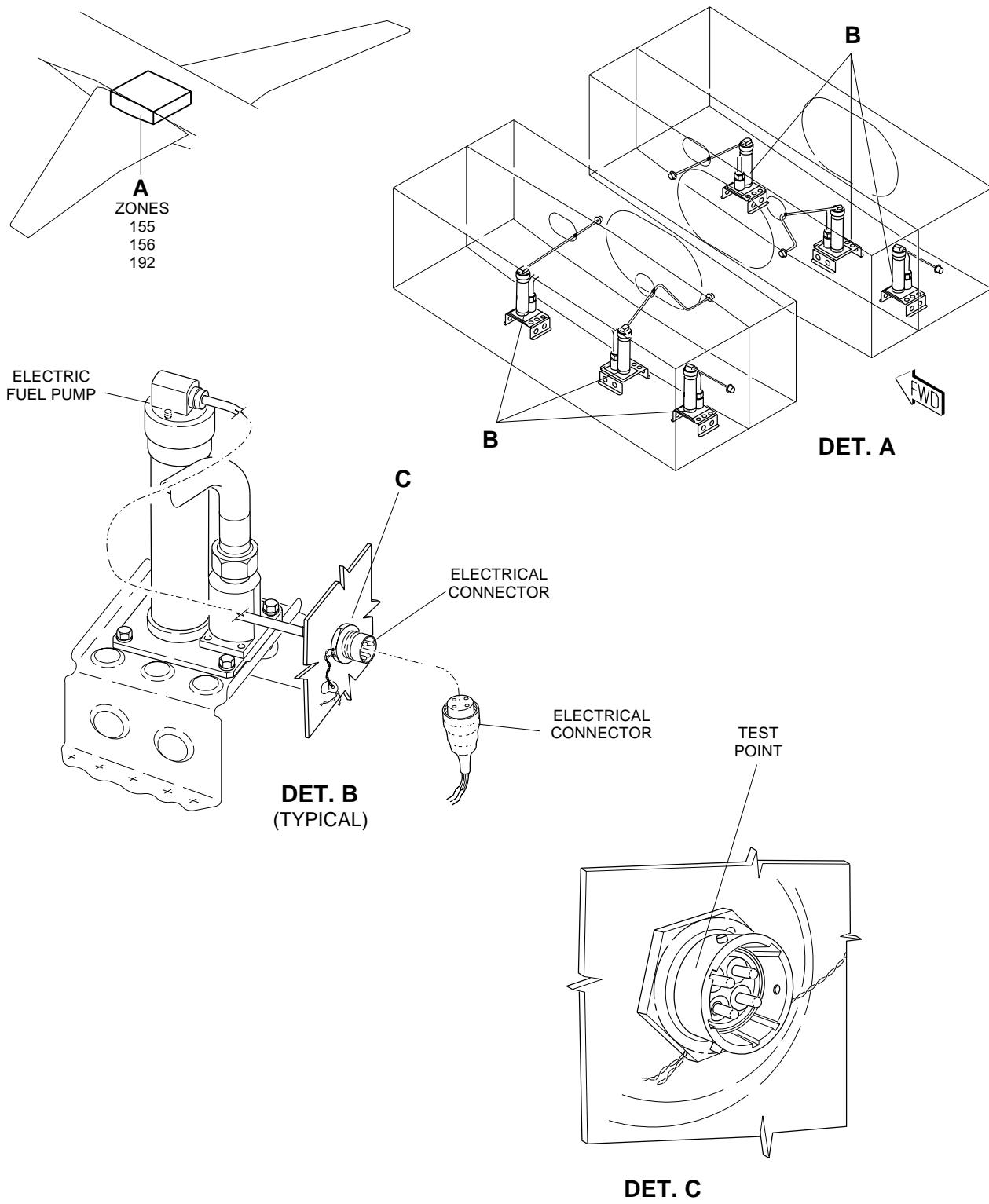


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EFFECTIVITY: ACFT WITH WET WINGSTUB

Fuel Pump Connectors - Bonding Test

Figure 507 - Sheet 1

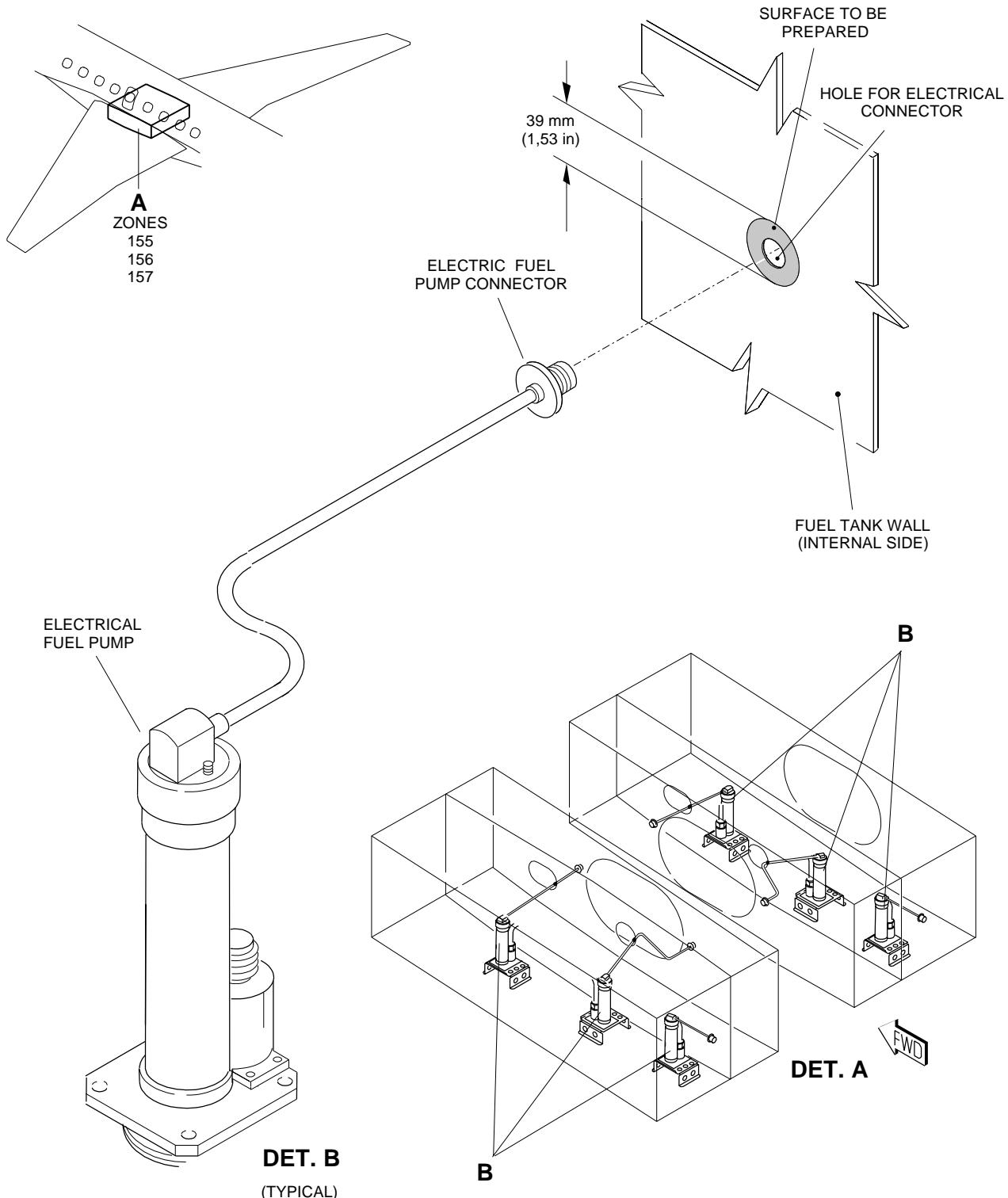


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EFFECTIVITY: ACFT WITH WET WINGSTUB

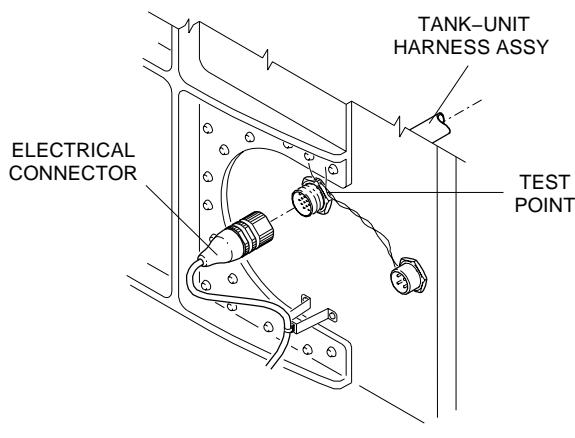
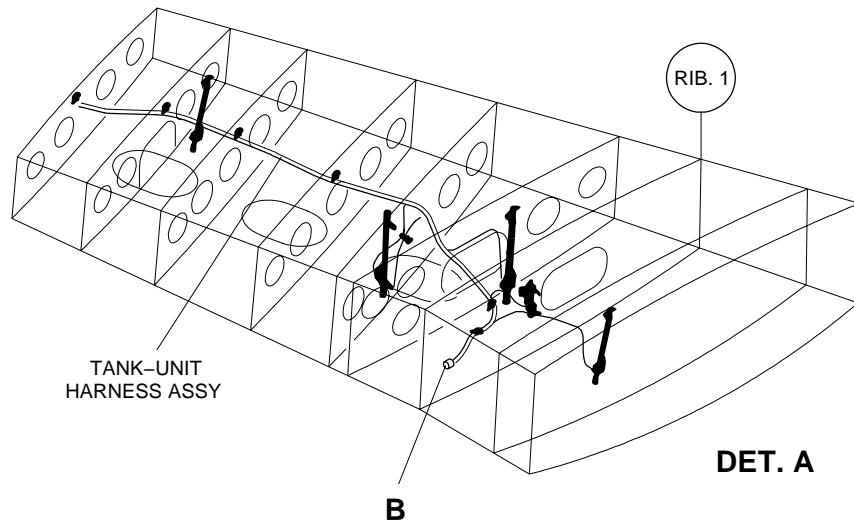
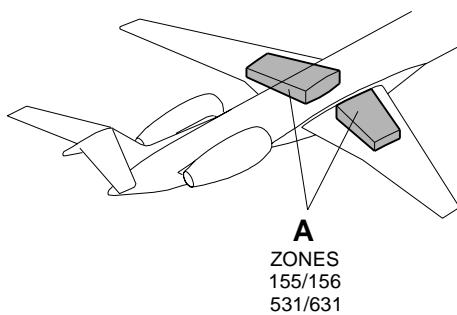
Fuel Pump Connectors - Bonding Test

Figure 507 - Sheet 2

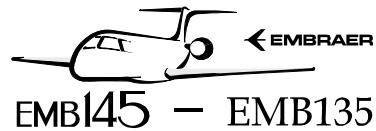


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EFFECTIVITY: ACFT WITH WET WINGSTUB
In-Tank Unit Harness Connector - Bonding Test
Figure 508



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TASK 28-11-00-700-806-A

EFFECTIVITY: ACFT WITH DRY WINGSTUB

7. WING FUEL TANK - BONDING TEST

A. General

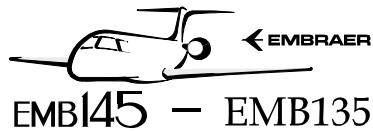
- (1) The function of this test is to do a check of bonding integrity at the fuel components in the fuel tank.

B. References

REFERENCE	DESIGNATION
AMM 28-21-21/401	-
AMM MPP 06-41-01/100	-
AMM MPP 06-44-00/100	- COMPONENT LOCATION
AMM MPP 12-11-01/300	- SERVICING
AMM MPP 20-13-21/200	- MAINTENANCE PRACTICES
AMM MPP 28-00-00/200	- MAINTENANCE PRACTICES
AMM MPP 28-11-01/400	- REMOVAL/INSTALLATION
AMM MPP 28-21-01/400	- REMOVAL/INSTALLATION

C. Zones and Accesses

ZONE	PANEL/DOOR	LOCATION
192	192AL	LH wing stub
192	192BR	RH wing stub
155	155BZ	LH wing stub
155	155CZ	LH wing stub
156	156BZ	RH wing stub
156	156CZ	RH wing stub
155	155DZ	LH wing stub
156	156DZ	RH wing stub
531	531AB	LH wing
531	531CB	LH wing
531	531DB	LH wing
541	541AB	LH wing
541	541DB	LH wing
631	631AB	RH wing
631	631CB	RH wing
631	631DB	RH wing
641	641AB	RH wing
641	641DB	RH wing



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D. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 425	Milliohmometer	To measure the bonding values	

E. Auxiliary Items

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Brush	To apply the remover	AR
Commercially available	Soft (cotton) cloth	To clean the surface	AR
Commercially available	Acrylic Spatula	To clean the surface	1

F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
MEP-13-073	Rodhiasolve E-23, Solvent	AR
MEP-21-016	Ardrox 2871	AR
MIL-C-81706	Alodyne 1200S	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	FUNCTION	PLACE
2	Do the task	Wing Tank

I. Preparation

SUBTASK 841-007-A

- (1) Defuel and drain the aircraft ([AMM MPP 12-11-01/300](#)).

WARNING: BEFORE YOU DO THE TASK, OBEY THE SAFETY PRECAUTIONS GIVEN IN [AMM MPP 28-00-00/200](#) TO PREVENT INJURY TO PERSONS AND DAMAGE TO THE MATERIAL.

- (2) Open access panels (AMM MPP 06-41-01/100, [AMM MPP 06-44-00/100](#) and [AMM MPP 28-11-01/400](#)) shown below:
 - (a) LH wing fuel tank:
 - 192AL/155BZ/155CZ/155DZ/531AB/531CB/531DB/541AB/541DB
 - (b) RH wing fuel tank:
 - 192BR/156BZ/156CZ/156DZ/631AB/631CB/631DB/641AB/641DB

- WARNING:** • **MAKE SURE THAT THE AIRCRAFT IS DEENERGIZED**
- **VENTILATE THE TANKS TO DECREASE THE CONCENTRATION OF FUEL VAPORS.**
 - **THE FRESH AIR FLOW FROM THE VENTILATION EQUIPMENT MUST KEEP THE FUEL VAPOR CONCENTRATION LEVELS INSIDE THE FUEL TANKS BELOW 10% LOWER EXPLOSIVE LIMITS (LEL).**
 - **THE FRESH AIR FLOW FROM THE VENTILATION EQUIPMENT MUST KEEP THE OXYGEN LEVELS INSIDE THE FUEL TANKS BETWEEN 19.5 % AND 23.5% BY VOLUME.**

- (3) Do the preparation for an internal fuel tank maintenance procedure. Obey the instructions for Internal Fuel Tank Maintenance General Procedures ([AMM MPP 28-00-00/200](#)).
- J. Functionally Check critical bonding integrity of selected conduits inside the wing tank, Fuel Pump and FQIS connectors at tank wall by conductivity measurements. ([Figure 509](#)) ([Figure 510](#)) ([Figure 511](#))

SUBTASK 720-003-A

- (1) Put the milliohmometer (GSE 425) probe to the nearest ground point outside the tank and do a check for proper installation:
 - (a) Do a check to see if the probe is in contact to the grounding point.
 - (b) Measure the resistance between the ground point and one of the main frames of the aircraft. The measurement must be less than $2\text{ m}\Omega$.
- (2) Do the bonding test for the wing tank tubes:
 - (a) With soft (cotton) cloth, clean the point to be measured. Make sure that the point to be tested is dry.

WARNING: WHEN YOU DO THE ELECTRICAL BONDING TEST INSIDE THE TANK, YOU CAN CAUSE SPARKS. MAKE SURE THAT THE FUEL TANK IS COMPLETELY DRY AND THE FUEL VAPOR CONCENTRATION LEVELS INSIDE THE FUEL TANKS IS LESS THAN 10% LOWER EXPLOSIVE LIMITS (LEL).

CAUTION: DO NOT MARK, SCRATCH OR DAMAGE THESE ITEMS DURING THE MEASUREMENTS.

- (b) Put the test probe at the test point to measure the related resistance and do the electrical bonding test according to table 501 and figure 509. Do this test in the two wing tanks:

Table 504 - TUBING TEST POINTS

Test Point	Access Panel		Fuel Line	Maximum Value (mΩ)
	Left Tank	Right Tank		
1	531AB	631AB	Tank Vent Line	200

Table 504 - TUBING TEST POINTS (Continued)

Test Point	Access Panel		Fuel Line	Maximum Value (mΩ)
	Left Tank	Right Tank		
2	531CB	631CB	Tank Vent Line	200
3	531AB	631AB	Motive Flow Line	200
4	531CB	631CB	Motive Flow Line	200
5	531DB	631DB	Pilot Valve Line	200
6	541AB	541AB	Pilot Valve Line	200
7	541DB	541DB	Vent Valve Line	200

- (c) The maximum resistance value must be less than the value given in Table 501. If the resistance value is greater than the value given in Table 501, do the corrective actions from step (1) to (8):

- 1 Replace the nearest bonding clamp of the applicable tube.
- 2 With a clean cloth soaked with solvent RHODIASOLVE E-23, clean the faying surfaces between the applicable clamp and the tube and between the clamp and the clamp support. Before solvent RHODIASOLVE E-23 evaporates, dry these areas with a clean dry cloth.
- 3 Do a visual inspection on the faying surfaces to make sure that there is no corrosion.
- 4 With a clean cloth soaked with solvent RHODIASOLVE E-23, clean the bolts, washers and nuts, as applicable. Before solvent RHODIASOLVE E-23 evaporates, dry these items with a clean dry cloth.

NOTE: Do not touch the surfaces after you clean them.

- 5 For tubes with Gamah couplings, replace gamah couplings. Make sure that the faying surfaces between the fuel tube and the Gamah couplings are clean.
- 6 For tube with bonding jumpers installed, do the bonding procedure, method 7 ([AMM MPP 20-13-21/200](#))
- 7 Do the electrical bonding test again.
- 8 Do the bonding protection, as applicable ([AMM MPP 20-13-21/200](#)).

- (d) Repeat the step (2) for the opposite tank.

- (3) Get access to the LH and RH Electric Booster Pump connectors.

- (4) Do the electrical bonding test for the six fuel pump connectors:

- (a) Disconnect the applicable fuel pump electrical connector
- (b) With soft (cotton) cloth, clean the point to be measured. Make sure that the point to be tested is clean.
- (c) Put the test probe at the applicable electrical connector ([Figure 510](#)).
- (d) The maximum resistance value must be less than 15 mΩ. If the resistance value is greater than 15 mΩ, do the corrective actions from step 1 to 8:
 - 1 Remove the applicable fuel pump connector. Refer to AMM 28-21-21/401.
 - 2 Do a check to know if the hole for the electric fuel pump connector in the internal side of the fuel tank wall is prepared for bonding. If the electrical connector hole is not prepared, do steps from a to b ([Figure 510](#)). If the surface is prepared, go to step 3:
 - a Determine the area to be bonded:
 - 1) Do a mark around the hole for the electrical connector in the fuel tank wall. This mark must be 39 mm (1.53 inch) in diameter.
 - b Remove the nonconductive coating from the area to be bonded:
 - 1) Apply a brush soaked with remover Ardrox 2871.
 - 2) Remove coating with a spatula.

WARNING: DO NOT MIX ALODYNE WITH ORGANIC SOLVENTS (ALCOHOLS, KETONES, ETC.). WHEN YOU MIX ALODYNE AND ORGANIC SOLVENTS, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

CAUTION: DO NOT PUT CLEANING CLOTHS, BRUSH, OR SPONGES INTO SOLVENT CONTAINER TO PREVENT SOLVENT CONTAMINATION. CONTAMINATED SOLVENT CAN CAUSE DAMAGE TO THE EQUIPMENT.

- 3 Clean the surface with a cloth soaked in solvent. Before the solvent evaporation, clean the surface with a clean dry cloth.
- 4 After cleaning, with a brush, apply a thin coat of Alodyne on the prepared surface and wait until the surface is amber.
- NOTE: The Alodyne 1200S solution pot life is 24 hours.
- 5 Clean the base of fuel pump connector with a cloth soaked in solvent. Before the solvent evaporation, clean the base of fuel pump connector with a clean dry cloth.
- 6 Install the fuel pump connector. Refer to [AMM MPP 28-21-01/400](#).
- 7 Do the electrical bonding test again.

- 8 Do the bonding protection at the connector ([AMM MPP 20-13-21/200](#)).
- (e) Connect the applicable fuel pump connector.
 - (f) Do the bonding test for other fuel pump electrical connectors.
- (5) Get access to the LH and RH tank unit harness connectors.
- (6) Do the electrical bonding test for the two tank unit harness connectors ([Figure 511](#)):
- (a) Disconnect the applicable tank unit harness connector
 - (b) With soft (cotton) cloth, clean the point to be measured. Make sure that the point to be tested is clean.
 - (c) Put the test probe at the applicable electrical connector.
 - (d) The maximum resistance value must be less than 15 mΩ. If the resistance value is greater than 15 mΩ, do the corrective actions from step 1 to 6:
 - 1 Remove the applicable tank unit harness connector.

WARNING: DO NOT MIX ALODYNE WITH ORGANIC SOLVENTS (ALCOHOLS, KETONES, ETC.). WHEN YOU MIX ALODYNE AND ORGANIC SOLVENTS, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

CAUTION: DO NOT PUT CLEANING CLOTHS, BRUSH, OR SPONGES INTO SOLVENT CONTAINER TO PREVENT SOLVENT CONTAMINATION. CONTAMINATED SOLVENT CAN CAUSE DAMAGE TO THE EQUIPMENT.

- 2 Clean the surface with a cloth soaked in solvent. Before the solvent evaporation, clean the surface with a clean dry cloth.
- 3 After cleaning, apply a thin coat of Alodyne on the prepared surface and wait until the surface is amber.

NOTE: The Alodyne 1200S solution pot life is 24 hours.

- 4 Clean the base of tank unit harness connector with a cloth soaked in solvent. Before the solvent evaporation, clean the base of tank unit harness connector with a clean dry cloth.
- 5 Install the tank unit harness connector.
- 6 Do the electrical bonding test again.
- (e) Connect the applicable electrical connector.
 - (f) Do the bonding protection ([AMM MPP 20-13-21/200](#)).
 - (g) Do the bonding test for the opposite side.



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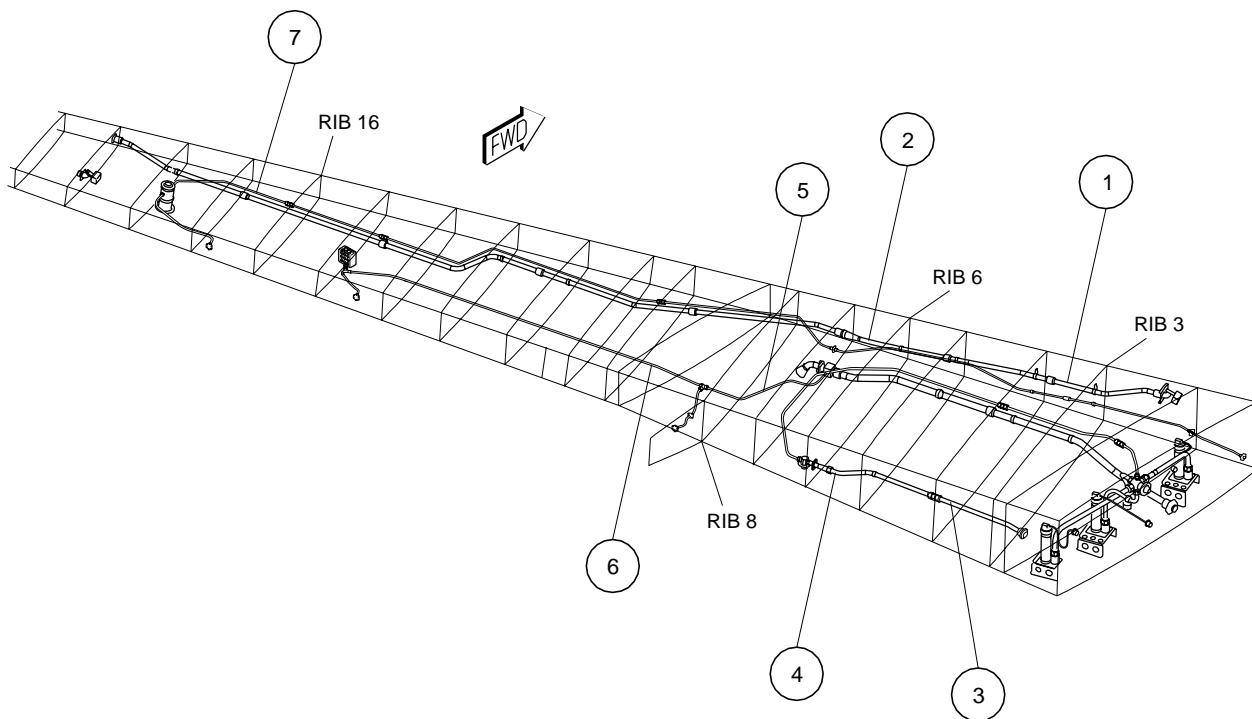
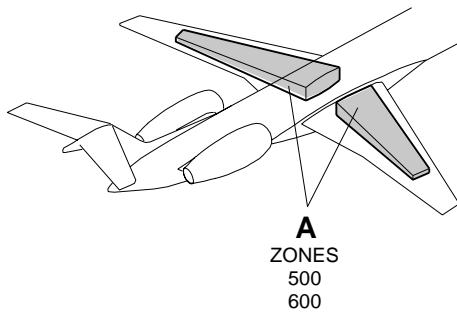
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K. Follow-on

SUBTASK 842-007-A

- (1) Obey the instructions given in Internal Fuel Tank Maintenance General Procedures ([AMM MPP 28-00-00/200](#)).
- (2) Close access panels ([AMM MPP 06-44-00/100](#) and [AMM MPP 28-11-01/400](#)) shown below:
 - (a) LH wing fuel tank:
 - 192AL/155BZ/155CZ/155DZ/531AB/531CB/531DB/541AB/541DB
 - (b) RH wing fuel tank:
 - 192BR/156BZ/156CZ/156DZ/631AB/631CB/631DB/641AB/641DB

EFFECTIVITY: ACFT WITH DRY WINGSTUB
 Tubes - Bonding Test (Refer to Table 501)
 Figure 509



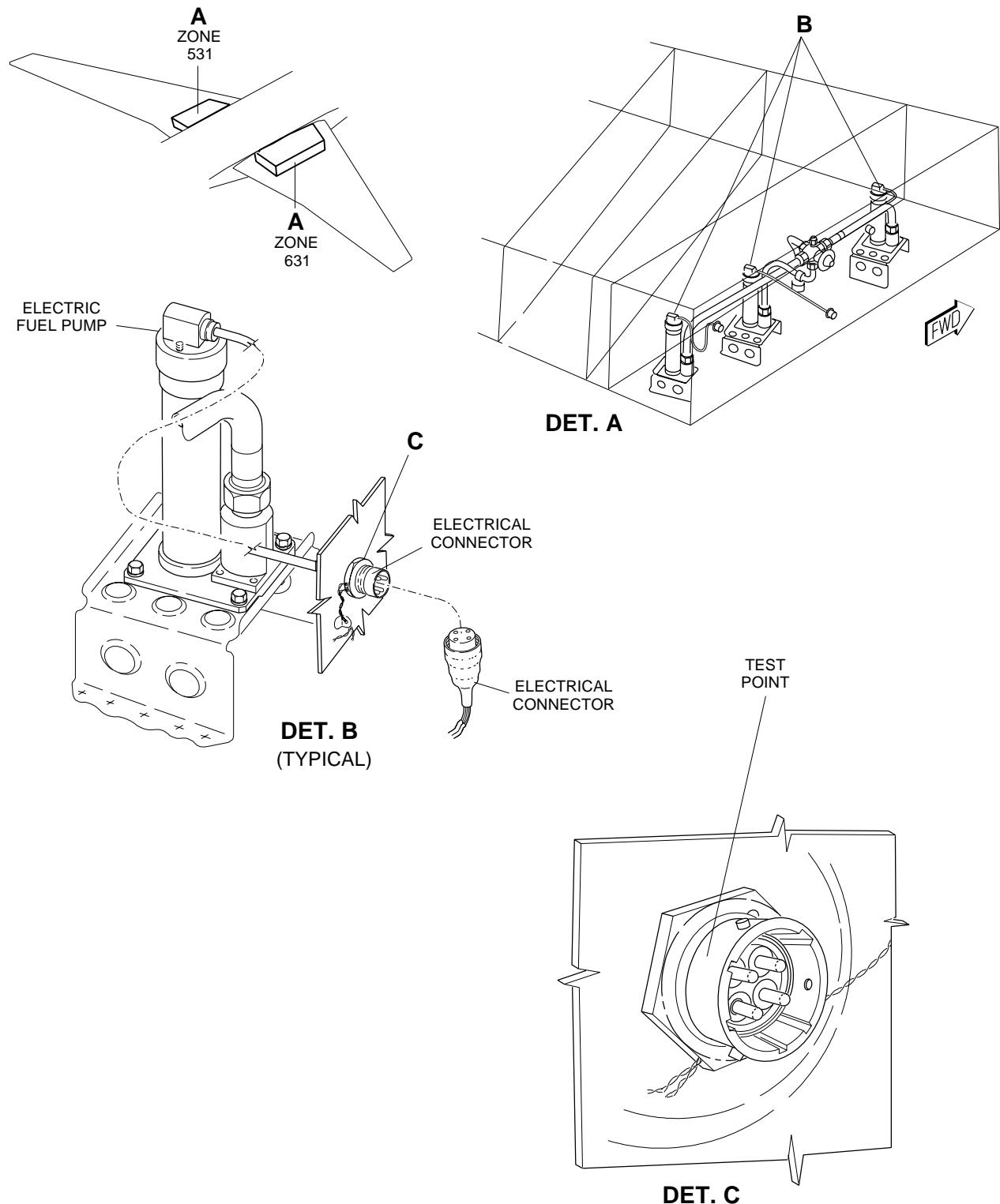
DET. A

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EFFECTIVITY: ACFT WITH DRY WINGSTUB

Fuel Pump Connectors - Bonding Test

Figure 510 - Sheet 1

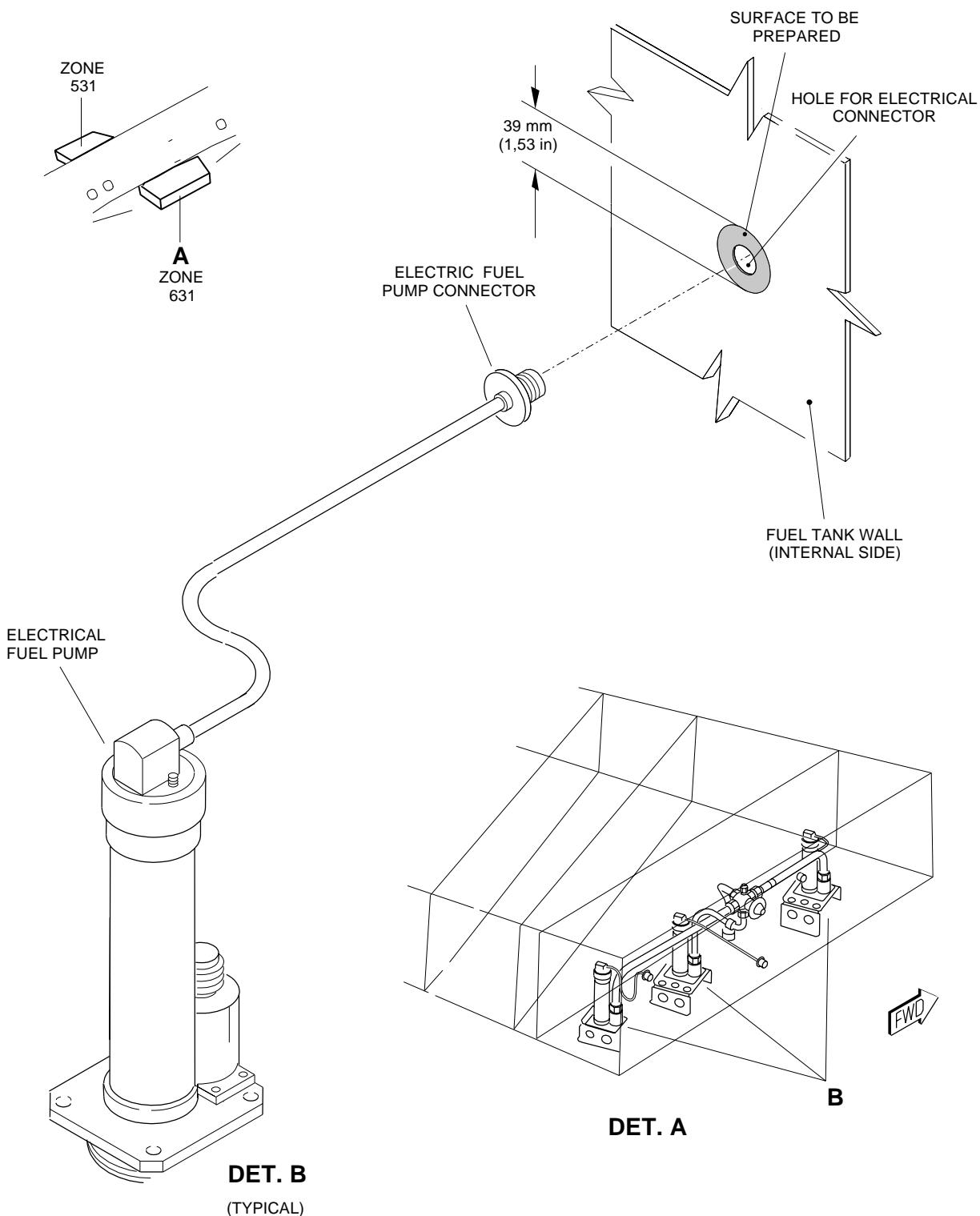


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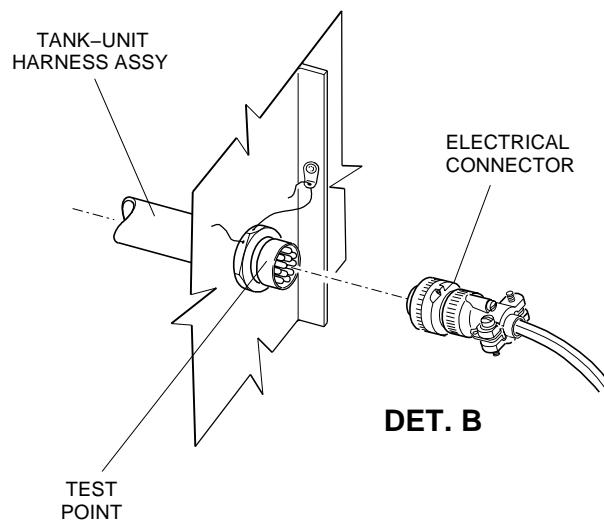
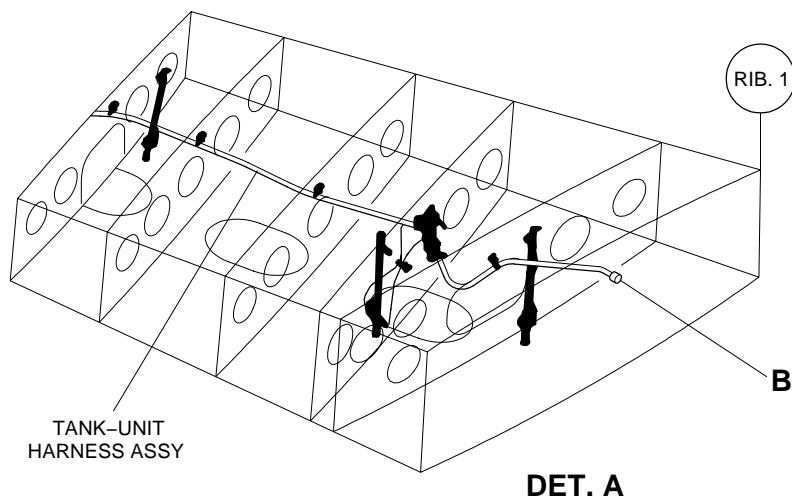
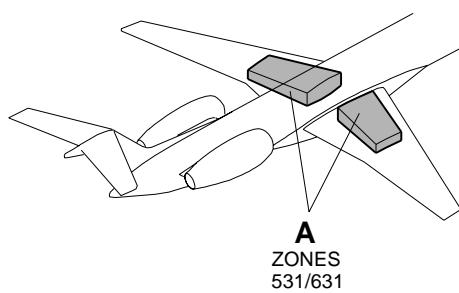
EFFECTIVITY: ACFT WITH DRY WINGSTUB

Fuel Pump Connectors - Bonding Test

Figure 510 - Sheet 2



EFFECTIVITY: ACFT WITH DRY WINGSTUB
In-Tank Unit Harness Connector - Bonding Test
Figure 511



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