DUAL HEAT EXCHANGER - REMOVAL/INSTALLATION

EFFECTIVITY: ALL

1. General

   A. This section gives the procedures to remove and install the dual heat exchangers of the cooling pack system.

   B. These procedures are applicable to the LH and RH dual heat exchangers.

   C. The LH dual heat exchanger is installed on the LH side of the forward lower fairing.

   D. The RH dual heat exchanger is installed on the RH side of the forward lower fairing.

   E. 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*
21-51-02-000-801-A	DUAL HEAT EXCHANGER - REMOVAL	ALL
21-51-02-400-801-A	DUAL HEAT EXCHANGER - INSTALLATION	ALL

TASK 21-51-02-000-801-A
EFFECTIVITY: ALL

2. DUAL HEAT EXCHANGER - REMOVAL

A. General

(1) This task gives the instructions to remove the dual heat exchanger.

B. References

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

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
191	191EL	LH side of the forward lower fairing
191	191FR	RH side of the forward lower fairing
191	191GL	Bottom of the forward lower fairing

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Sharp plastic spatula.		To remove the flange seal	1

E. Auxiliary Items

Not Applicable

F. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
Isopropyl alcohol (TT-I-735)		AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	LH or RH side of the forward lower fairing
1	Helps the other technician	LH or RH side of the forward lower fairing

I. Preparation

SUBTASK 841-002-A

(1) On the Circuit Breaker Panel, open the PACK 1 and PACK 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.

(2) Remove access panels as applicable:

- 191EL or 191FR (AMM MPP 06-41-01/100).
- 191GL (AMM MPP 06-41-01/100).

J. Removal (Figure 401)

SUBTASK 020-002-A

(1) Loosen the clamps (9), (10), (11) and (23) to disconnect the tubes (16), (17), (18) and (19) from the dual heat exchanger (1).

(2) Loosen the clamp (21) to disconnect the rubber connection (20) from the dual temperature control valve.

(3) Loosen the clamp (7) to disconnect the outlet grate (6) from the duct (8).

(4) Remove the screws (5) (10 positions) and then remove the outlet grate (6).

(5) Get access to the bolts (4) and washers (3) through the duct (8) . Remove the bolts (4) and washers (3) (8 positions).

(6) Remove the duct (8).

(7) Remove the bolts (12) and washers (13) (10 positions), and release the duct (14).

(8) Loosen the clamp (24) to disconnect the dual heat exchanger (1) from the air cycle machine (ACM) (22).

(9) Remove the bolt (46), washer (47) and lock washer (48) to release the end of the bonding strap (45) from the dual heat exchanger (REF.).

(10) Remove the nut (31), washers (30) and bolt (44) that attach the dual heat exchanger (1) to the rod (43).

(11) Remove the nut (35), washers (34) and (37), and bolt (38) that attach the dual heat exchanger (1) to the rod (36).

(12) Hold the dual heat exchanger (1).

(13) Remove the nut (32), washer (42), bushing (43), washer (40), and bolt (39) that attach the dual heat exchanger (1) to the support (41).

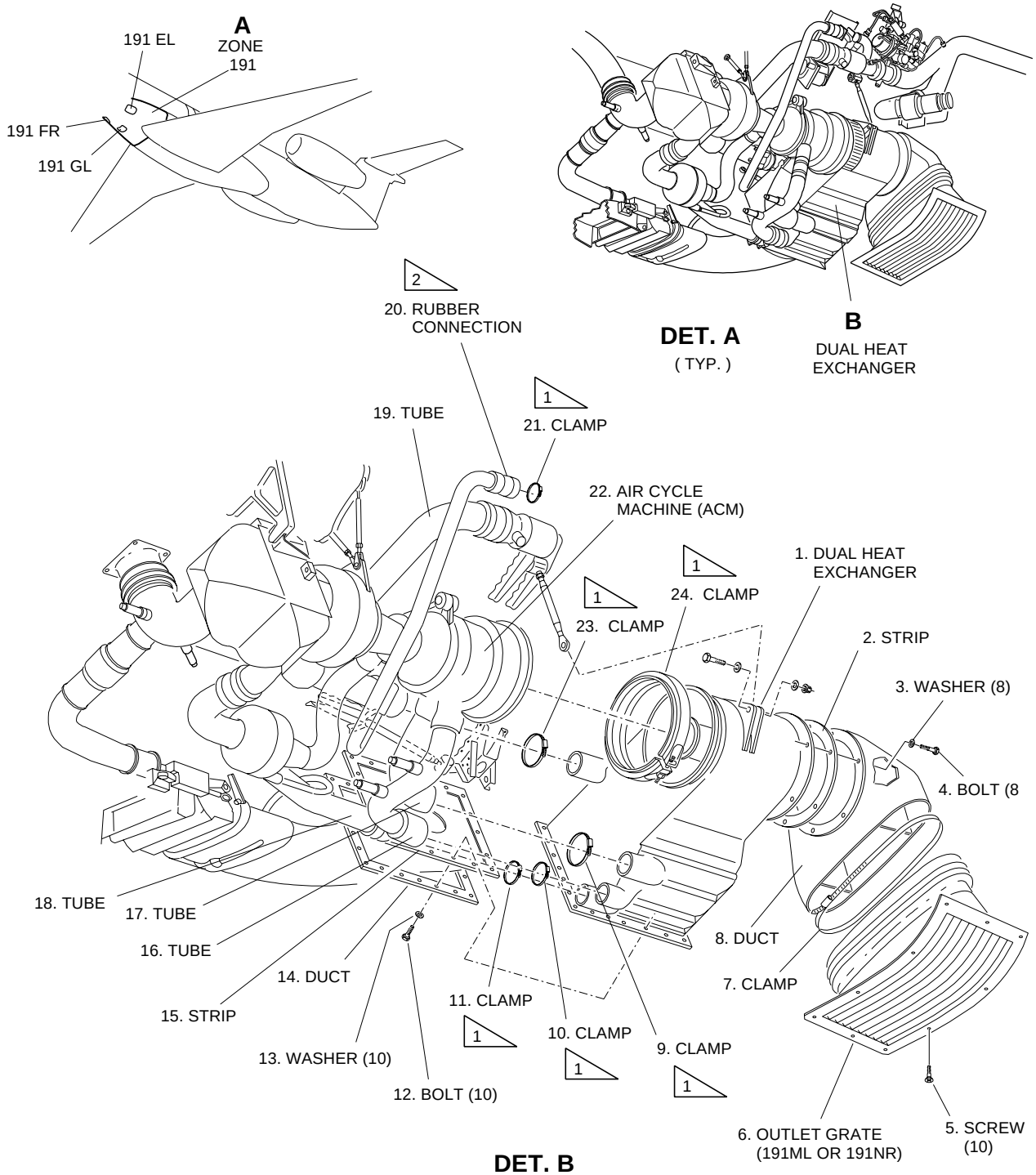
(14) Remove the dual heat exchanger (1).

(15) With a sharp plastic spatula (or equivalent) and isopropyl alcohol (TT-I-735) remove the flange seal (49) from the dual heat exchanger (1).

EFFECTIVITY: ALL

Dual Heat Exchanger - Removal/Installation

Figure 401 - Sheet 1



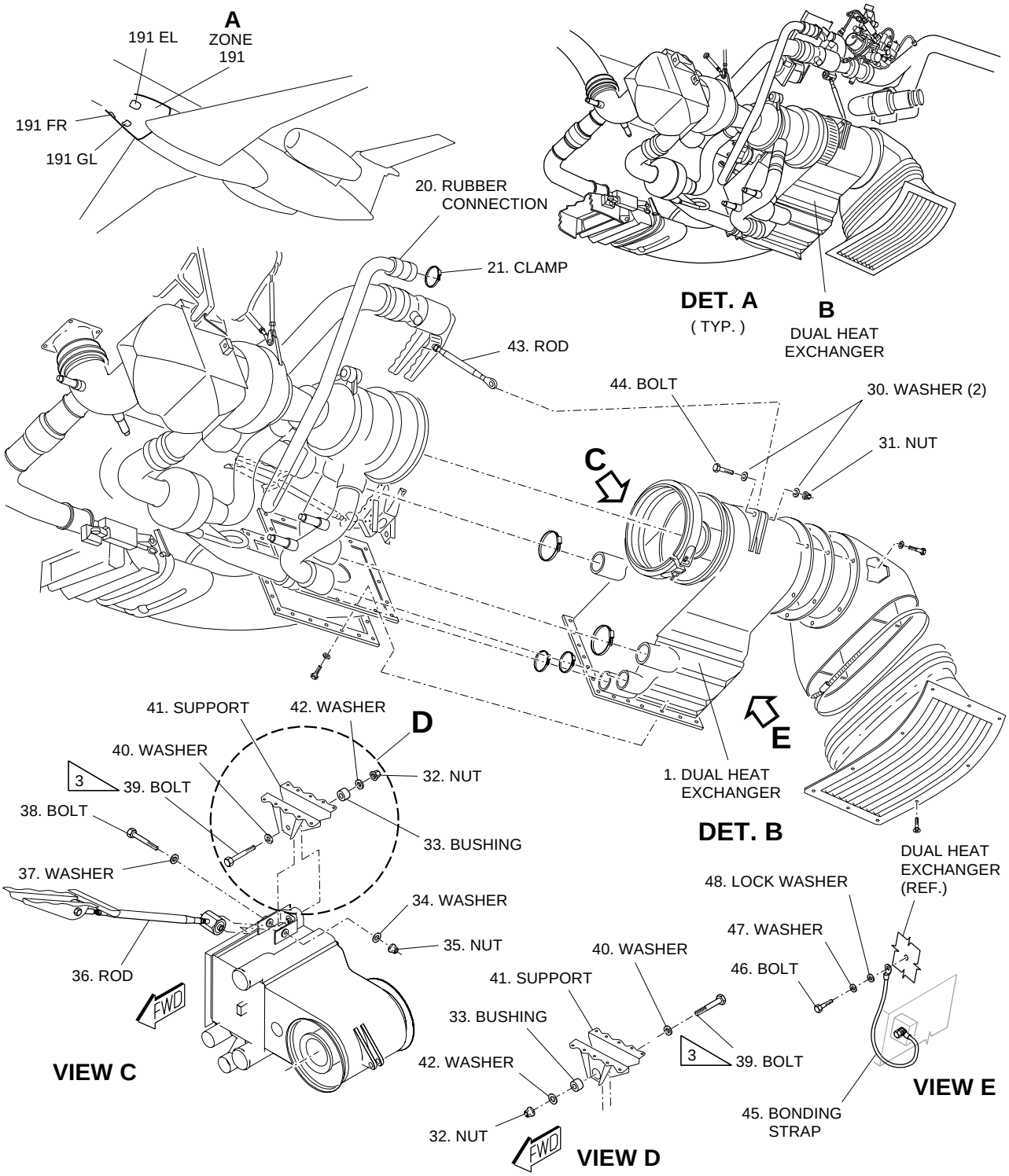
1 TORQUE: 5.65 − 6.21 N.m (50 − 55 lb.in)

2 LUBRICANT

EM145AMM210981C.DGN

EFFECTIVITY: ALL

Dual Heat Exchanger - Removal/Installation
Figure 401 - Sheet 2



3 THE BOLT INSTALLATION DIRECTION DEPENDS ON THE AIRCRAFT. INSTALL THE BOLT ACCORDING TO THE ORIGINAL FACTORY INSTALLATION.

EM145AMM210982D.DGN

TASK 21-51-02-400-801-A
EFFECTIVITY: ALL

3. DUAL HEAT EXCHANGER - INSTALLATION

A. General

(1) This task gives the instructions to install the dual heat exchanger.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM MPP 21-51-14/600	- INSPECTION/CHECK
AMM TASK 20-13-21-910-801-A/200	TYPES OF ELECTRICAL BONDING AND SURFACE PREPARATION - STANDARD PROCEDURES
AMM TASK 21-51-00-700-802-A/500	-
AMM TASK 28-41-00-200-801-A/600	-
IPC 21-51-00	COOLING PACK SYSTEM

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
191	191EL	LH side of the forward lower fairing
191	191FR	RH side of the forward lower fairing
191	191GL	Bottom of the forward lower fairing

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Torque wrench (Range: 0-100 lb.in)	To tighten the clamps	

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Plastic spatula	To remove the old strip	
Commercially available	Sharp-pointed tool	To make holes in the raw material	

F. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
Commercially available	Isopropyl alcohol (Fed. Spec. TT-I-735)	To clean the surface

(Continued)

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
Commercially available	Methyl ethyl ketone (ASTM D 740)	To clean the surface
Temporary Rubber Lubricant	P- 80 RUBBER LUBRICANT	AR

G. Expendable Parts

ITEM	*IPC REFERENCE (VENDOR REFERENCE)*	*QTY*
Strip	IPC 21-51-00	2 (If necessary)

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	LH or RH side of the forward lower fairing
1	Helps the other technician	LH or RH side of the forward lower fairing

I. Preparation (Figure 401)

SUBTASK 841-003-A

(1) If necessary, replace the strip (2) of the duct (8) as follows:

(a) Remove the old strip (2) from the duct (8). For this, use a plastic spatula.

(b) Clean the surface of the flange of the duct (8) with a cloth soaked in isopropyl alcohol (Fed. Spec. TT-I-735) or methyl ethyl ketone (ASTM D 740).

(c) Dry the flange of the duct (8) with a clean and dry cloth.

(d) Install a new strip (2) on the flange of the duct (8).

NOTE: Prepare the new strip (2) as follows:

1. Clean the surface of the outlet duct (8).
2. Bond the raw material to the surface of the outlet duct (8).
3. With the aid of a sharp-pointed tool (e.g.: a sheet-metal scriber), make holes in the raw material at the locations where there are holes for bolt (4).
4. Cut the raw material to the internal and external boundaries of the outlet duct (8).

(2) If necessary, replace the strip (15) of the duct (14) as follows:

(a) Remove the old strip (15) from the duct (14). For this, use a plastic spatula.

(b) Clean the surface of the flange of the duct (14) with a cloth soaked in isopropyl alcohol (Fed. Spec. TT-I-735) or methyl ethyl ketone (ASTM D 740).

(c) Dry the flange of the duct (14) with a clean and dry cloth.

(d) Install a new strip (15) on the flange of the duct (14).

NOTE: Prepare the new strip (15) as follows:

1. Clean the surface of the ram-air duct assembly (14).
2. Bond the raw material to the surface of the flange of the ram-air duct assembly (14). Cut the raw material to the size of the flange of the ram-air duct assembly (14).
3. With the aid of a sharp-pointed tool (e.g.: a sheet-metal scriber), make holes in the raw material at the locations where there are holes for bolt (12).
4. Cut the raw material to the internal and external boundaries of the ram-air duct assembly (14).

J. Installation (Figure 401)

SUBTASK 420-002-A

(1) Fully clean the flange surface of the dual heat exchanger (1) with isopropyl alcohol, TT-I-735.

(2) Remove the tape from the adhesive side of the new flange seal (49) and install the new seal on the flange area of the heat exchanger (1). Push the seal against the flange on all areas of the seal.

(3) Put the dual heat exchanger (1) on the support (41).

(4) Install the bolt (39), washer (40), bushing (33), washer (42) and nut (32) to attach the dual heat exchanger (1) to the support (41).

NOTE: If you find a damaged bushing (33) or housing, contact the EMBRAER Technical Support Department.

(5) Install the bolt (38), washers (37) and (34), and nut (35) to attach the dual heat exchanger (1) to the rod (36).

(6) Install the bolt (44), washers (30) and nut (31) to attach the dual heat exchanger (1) to the rod (43).

(7) Put the end of the bonding strap (45) in position on the dual heat exchanger (REF.) and attach it with the lock washer (48), washer (47) and bolt (46). Refer to AMM TASK 20-13-21-910-801-A/200.

(8) Install the clamp (24) to connect the dual heat exchanger (1) to the air cycle machine (ACM) (22).

(9) Use a torque wrench to torque the clamp (24) to 5.65 - 6.21 N.m (50 - 55 lb.in).

(10) Put the duct (14) on the flange of the dual heat exchanger (1).

(11) Put the strip (15) on the flange of the duct (14) and install the bolts (12) and washers (13) (10 positions).

(12) Put the duct (8) on the flange of the dual heat exchanger (1) and install the bolts (4), and washers (3) (8 positions).

(13) Connect the tubes (16), (17), (18) and (19) and attach them with the clamps (10), (9), (11) and (23).

NOTE: Before installation, make sure that the duct flanges and clamps are in good conditions (AMM MPP 21-51-14/600). If any duct and/or clamp shows signs of damage, replace it (them) as applicable.

(14) Use a torque wrench to torque the clamps (9), (10), (11) and (23) to 5.65 - 6.21 N.m (50 - 55 lb.in).

NOTE: When you install the clamps (9), (10), (11) and (23), pay attention to the correct position of the inner shield during the torque application, to not block the inner shield tip with the hex bolt head or with the convoluted spring.

(15) Apply a thin layer of lubricant P- 80 RUBBER LUBRICANT EMULSION on the rubber connection (20).

(16) Connect the rubber connection (20) to the dual temperature control valve and attach it with the clamp (21).

(17) Use a torque wrench to torque the clamp (21) to 5.65 - 6.21 N.m (50 - 55 lb.in).

(18) After the initial torque is complete, use a torque wrench and apply a torque of 5.65 - 6.21 N.m (50 - 55 lb.in) to the clamps (9), (10), (11) and (23) again.

(19) Put the outlet grate (6) in position on the forward lower fairing.

(20) Connect the sleeve of the outlet grate (6) to the duct (8) and attach it with the clamp (7).

(21) Attach the outlet grate (6) to the forward lower fairing with the screws (5) (10 positions).

(22) On the Circuit Breaker Panel, close the PACK 1 and PACK 2 circuit breakers and remove the DO-NOT-CLOSE tag from them.

(23) Install access panels as applicable:

- 191EL or 191FR (AMM MPP 06-41-01/100).
- 191GL (AMM MPP 06-41-01/100).

(24) Do an operational test of the cooling pack system (AMM TASK 21-51-00-700-802-A/500).

NOTE: Let the cooling packs operate for 5 minutes.

WARNING: DO NOT TOUCH THE COOLING PACK SYSTEM DUCTS OR COMPONENTS IMMEDIATELY AFTER THE SYSTEM IS TURNED OFF. THE HIGH AIR TEMPERATURE CAN CAUSE INJURY TO YOU.

CAUTION: BE CAREFUL WHEN YOU HANDLE THE PACKS, VALVES, SENSING ELEMENTS, AND AIR CONDITIONING DUCTS. DO NOT LET OIL, GREASE OR RESIN GET ON THESE COMPONENTS.

(25) After the operational test is complete, get access to the dual heat exchanger again. Remove access panels as applicable:

- 191EL or 191FR (AMM MPP 06-41-01/100).
- 191GL (AMM MPP 06-41-01/100).

(26) On the Circuit Breaker Panel, open the PACK 1 and PACK 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.

(27) Use a torque wrench and apply a torque of 5.65 - 6.21 N.m (50 - 55 lb.in) to the clamps (9), (10), (11) and (23) again.

K. Follow-on

SUBTASK 842-002-A

(1) On the Circuit Breaker Panel, close the PACK 1 and PACK 2 circuit breakers and remove the DO-NOT-CLOSE tag from them.

(2) 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 (Section 6) of the Maintenance Review Board Report (MRB).

(3) Install access panels as applicable:

- 191EL or 191FR (AMM MPP 06-41-01/100).
- 191GL (AMM MPP 06-41-01/100).