

CONDENSER/MIXER - REMOVAL/INSTALLATION

EFFECTIVITY: ALL

1. General

- A. This section gives the procedures to remove and install the condenser/mixers of the cooling pack system.
- B. These procedures are applicable to the LH and RH condenser/mixers.
- C. The LH condenser/mixer is installed on the LH side of the forward lower fairing.
- D. The RH condenser/mixer 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
21-51-04-000-801-A	CONDENSER/MIXER - REMOVAL	ALL
21-51-04-400-801-A	CONDENSER/MIXER - INSTALLATION	ALL

TASK 21-51-04-000-801-A

EFFECTIVITY: ALL

2. CONDENSER/MIXER - REMOVAL

A. General

(1) This task gives the instructions to remove the condenser/mixer.

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

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

J. Removal [\(Figure 401\)](#)

SUBTASK 020-002-A

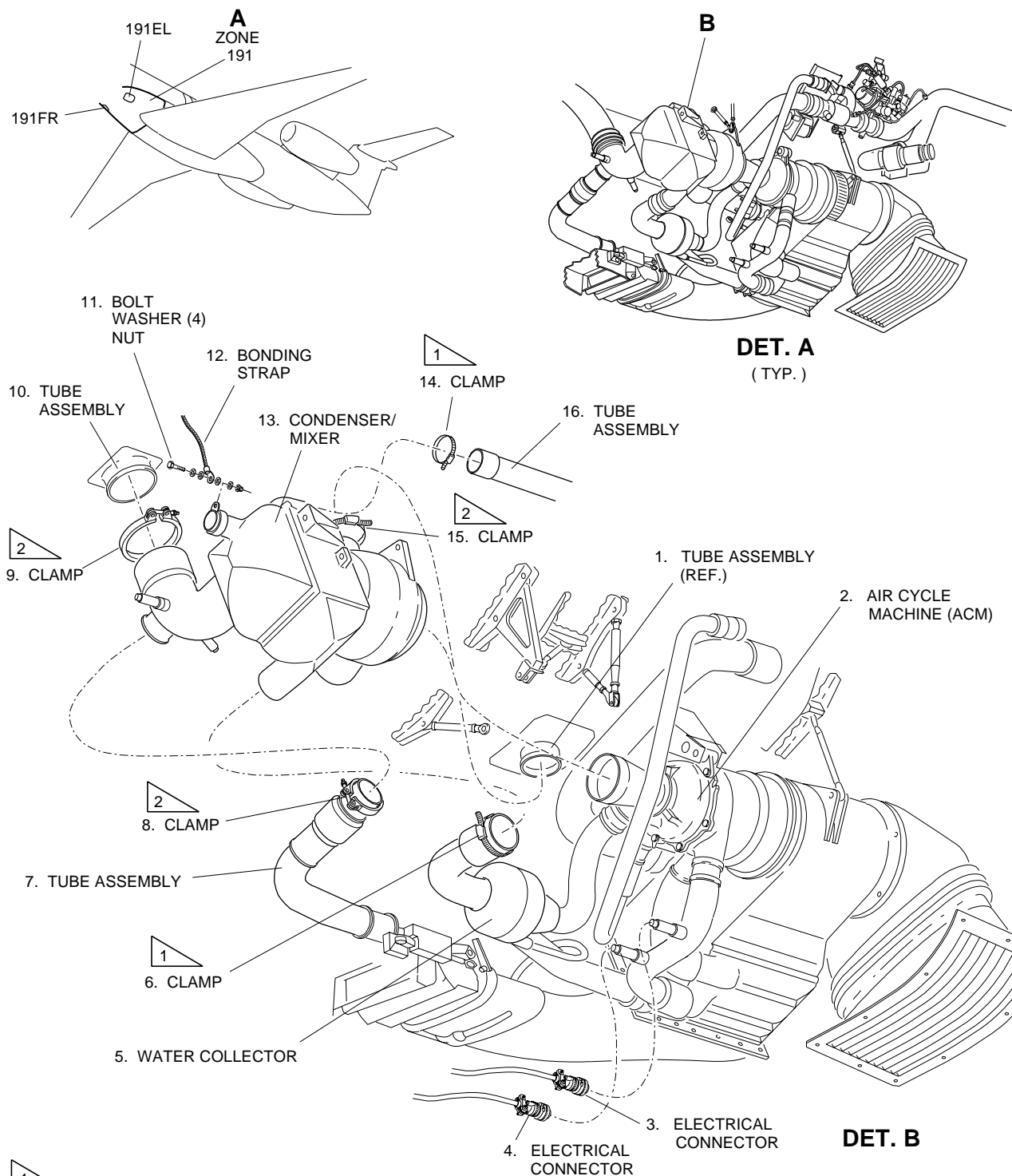
(1) Disconnect the electrical connectors (3) and (4).

- (2) Disconnect the bonding strap (12) from the condenser/mixer (13). For this, remove its attaching elements (11).
- (3) Loosen the clamps (9) and (8), and disconnect the tube assemblies (10) and (7) from the condenser/mixer (13).
- (4) Loosen the clamp (6) and disconnect the tube of the water collector (5) from the condenser/mixer (13).
- (5) Loosen the clamp (14) and disconnect the tube assembly (16) from the condenser/mixer (13).
- (6) Hold the condenser/mixer (13).
- (7) Loosen the clamp (15).
- (8) Remove the nut, washers, and bolt (22) that attach the condenser/mixer (13) to the rod (23).
- (9) Remove the nut, washers, bushing, and bolt (17) that attach the condenser/mixer (13) to the support (18) at the fuselage.
- (10) Remove the nut, washers, and bolt (21) that attach the condenser/mixer (13) to the rod assemblies (19) and (20).
- (11) Pull the condenser/mixer (13) to disconnect it from the air cycle machine (ACM) (2) duct.
- (12) Remove the condenser/mixer (13).

EFFECTIVITY: ALL

Condenser/Mixer - Removal/Installation

Figure 401 - Sheet 1



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

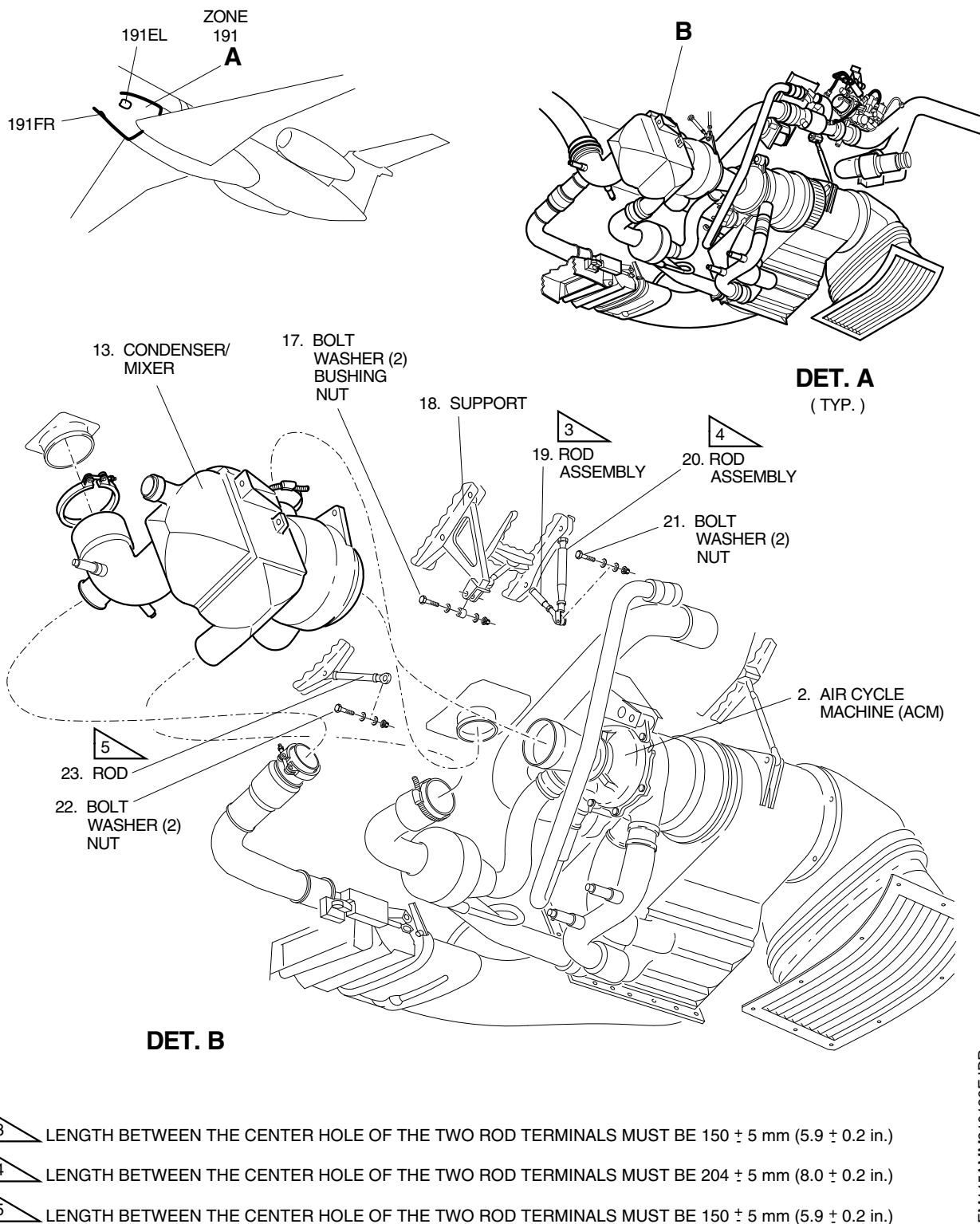
2 TORQUE: 2.82 N.m (25 lb.in)

EM145AMM210138F.DGN

EFFECTIVITY: ALL

Condenser/Mixer - Removal/Installation

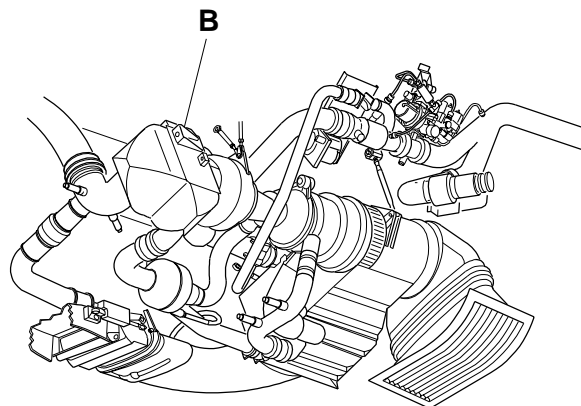
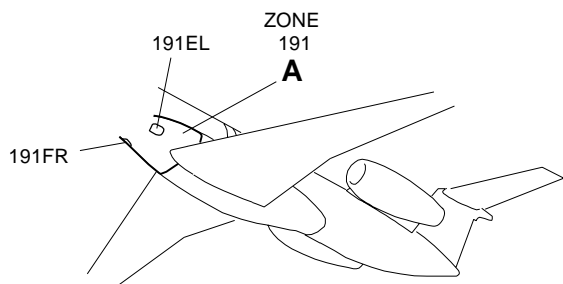
Figure 401 - Sheet 2



EFFECTIVITY: ALL

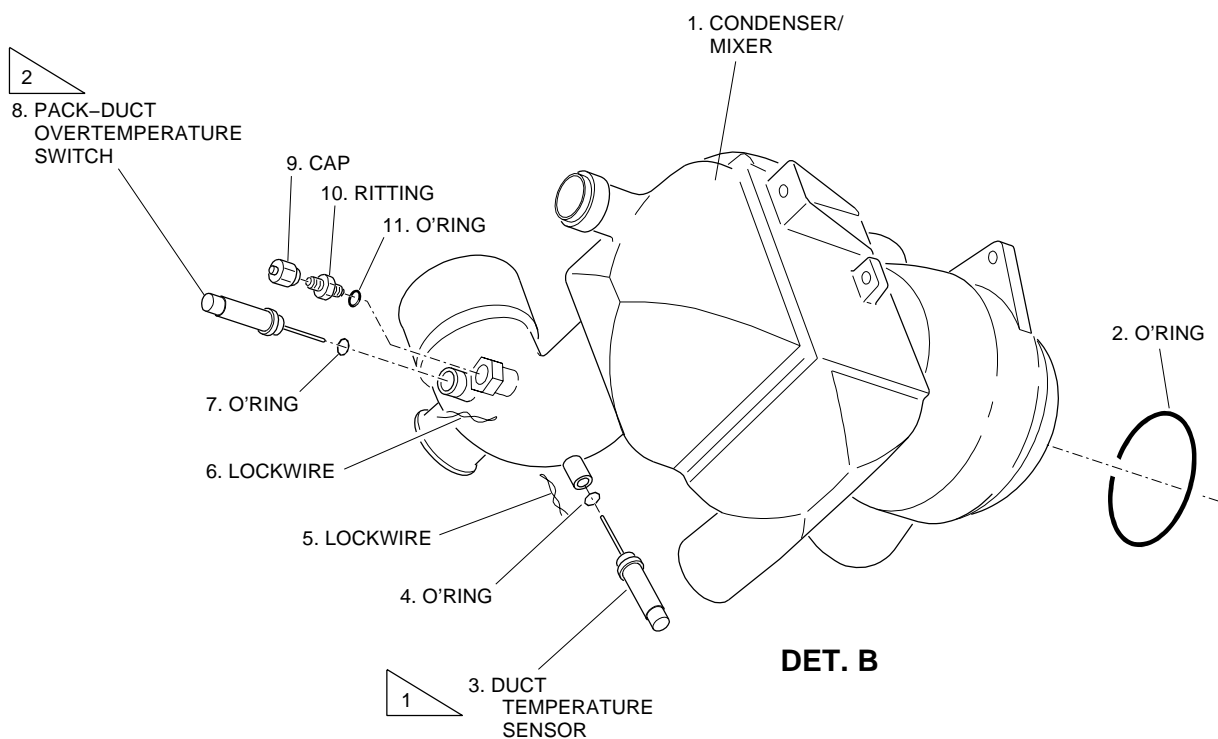
Condenser/Mixer - Removal/Installation

Figure 402





DET. A

(TYP.)



DET. B


TORQUE: 7.3–8.5 Nm (65–75 Lb.in)


TORQUE: 6.8–7.9 Nm (60–70 Lb.in)

EM145AMM210140E.DGN

TASK 21-51-04-400-801-A
EFFECTIVITY: ALL

3. CONDENSER/MIXER - INSTALLATION

A. General

(1) This task gives the instructions to install the condenser/mixer.

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	-
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

D. Tools and Equipment

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

E. Auxiliary Items

Not Applicable

F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
COR-BAN 27L or CA-1000	Sealant, Corrosion Inhibiting	AR

G. Expendable Parts

ITEM	IPC REFERENCE (VENDOR REFERENCE)	QTY
O-ring	IPC 21-51-00	3

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 841-003-A (Figure 402)

- (1) Cut the lockwires (5) and (6).
- (2) Remove and discard the old O-ring (2).
- (3) Remove and keep the duct temperature sensor (3) and the pack-duct overtemperature switch (8).
- (4) Remove and discard the old O-rings (4) and (7).
- (5) Install the new O-ring (2) to the condenser/mixer (1).
- (6) Install the new O-rings (4) and (7).
- (7) Install the duct temperature sensor (3) and the pack-duct overtemperature switch (8).
- (8) Safety the duct temperature sensor (3) and the pack-duct overtemperature switch (8).
- (9) If applicable to the aircraft configuration, do as follows:
 - (a) Remove the cap (9) and fitting (10).
 - (b) Remove and discard the old O-ring (11).
 - (c) Install the new O-ring (11).
 - (d) Tighten the fitting (10) and cap (9).

SUBTASK 840-002-A (Figure 401)

- (10) Do a check of the rod assemblies length to make sure that they are correctly adjusted before the condenser/mixer installation.

NOTE: The total length of the rod assemblies must be measured between the center hole of the rod terminals.

 - (a) For rod assembly (19), the total length between the center hole of the rod terminals must be 150 ± 5 mm (5.9 ± 0.2 in.).
 - (b) For rod assembly (20), the total length between the center hole of the rod terminals must be 204 ± 5 mm (8.0 ± 0.2 in.).
 - (c) For rod (23), the total length between the center hole of the rod terminals must be 150 ± 5 mm (5.9 ± 0.2 in.).
- (11) If the rod assembly (19) is with its length out of the reference tolerance, you must adjust it as follows:

- (a) On the rod terminal which will be installed on the structure support, make sure that the length between the base washer and the center hole of the terminal is approximately 25 mm (0.98 in.).
 - (b) On the rod terminal which the condenser/mixer (13) will be installed, make sure that the length between the base washer and the center hole of the terminal is 57 ± 0.5 mm (2.24 ± 0.02 in.).
 - (c) If necessary, adjust the rod terminal which will be installed on the structure support. To do this, cut the lockwire from the rod terminal nut (as applicable).
 - (d) Remove the rod terminal sufficiently to adjust its length. Apply sealant (COR-BAN 27L or CA-1000) on the rod end thread as applicable.
NOTE: You can also remove the nut, washers, and bolt that attach the rod terminal to the structure support in order to make the adjustment easier.
 - (e) Adjust the length of the rod terminal (length between the base washer and the center hole of the rod terminal) in a way that it stays with approximately 25 mm (0.98 in.).
 - (f) Safety the rod terminal nut in the adjusted position with lockwire (as applicable).
NOTE: If you removed the nut, washers, and bolt that attach the rod terminal to the structure support, install them again to attach the rod terminal back to the structure support.
 - (g) If necessary, adjust the rod terminal which the condenser/mixer (13) will be installed. To do this, cut the lockwire from the rod terminal nut (as applicable).
 - (h) Remove the rod terminal sufficiently to adjust its length. Apply sealant (COR-BAN 27L or CA-1000) on the rod end thread as applicable.
 - (i) Adjust the length of the rod terminal (length between the base washer and the center hole of the rod terminal) in a way that it stays with 57 ± 0.5 mm (2.24 ± 0.02 in.).
 - (j) Safety the rod terminal nut in the adjusted position with lockwire (as applicable).
 - (k) Make sure that the total length between the center hole of the rod terminals is 150 ± 5 mm (5.9 ± 0.2 in.).
- (12) If the rod assembly (20) is with its length out of the reference tolerance, you must adjust it as follows:
- (a) On the rod terminal which will be installed on the structure support, make sure that the length between the base washer and the center hole of the terminal is approximately 26 mm (1.02 in.).
 - (b) On the rod terminal which the condenser/mixer (13) will be installed, make sure that the length between the base washer and the center hole of the terminal is 52 ± 0.5 mm (2.04 ± 0.02 in.).
 - (c) If necessary, adjust the rod terminal will be installed on the structure support. To do this, cut the lockwire from the rod terminal nut (as applicable).

- (d) Remove the rod terminal sufficiently to adjust its length. Apply sealant (COR-BAN 27L or CA-1000) on the rod end thread as applicable.
NOTE: You can also remove the nut, washers, and bolt that attach the rod terminal to the structure support in order to make the adjustment easier.
 - (e) Adjust the length of the rod terminal (length between the base washer and the center hole of the rod terminal) in a way that it stays with approximately 26 mm (1.02 in.).
 - (f) Safety the rod terminal nut in the adjusted position with lockwire (as applicable).
NOTE: If you removed the nut, washers, and bolt that attach the rod terminal to the structure support, install them again to attach the rod terminal back to the structure support.
 - (g) If necessary, adjust the rod terminal which the condenser/mixer (13) will be installed. To do this, cut the lockwire from the rod terminal nut (as applicable).
 - (h) Remove the rod terminal sufficiently to adjust its length. Apply sealant (COR-BAN 27L or CA-1000) on the rod end thread as applicable.
 - (i) Adjust the length of the rod terminal (length between the base washer and the center hole of the rod terminal) in a way that it stays with 52 ± 0.5 mm (2.04 ± 0.02 in.).
 - (j) Safety the rod terminal nut in the adjusted position with lockwire (as applicable).
 - (k) Make sure that the total length between the center hole of the rod terminals is 204 ± 5 mm (8.0 ± 0.2 in.).
- (13) If the rod (23) is with its length out of the reference tolerance, you must adjust it as follows:
- (a) On the rod terminal which will be installed on the structure support, make sure that the length between the base washer and the center hole of the terminal is approximately 25 mm (0.98 in.).
 - (b) On the rod terminal which the condenser/mixer (13) will be installed, make sure that the length between the base washer and the center hole of the terminal is 57 ± 0.5 mm (2.24 ± 0.02 in.).
 - (c) If necessary, adjust the rod terminal which will be installed on the structure support. To do this, cut the lockwire from the rod terminal nut (as applicable).
 - (d) Remove the rod terminal sufficiently to adjust its length. Apply sealant (COR-BAN 27L or CA-1000) on the rod end thread as applicable.
NOTE: You can also remove the nut, washers, and bolt that attach the rod terminal to the structure support in order to make the adjustment easier.
 - (e) Adjust the length of the rod terminal (length between the base washer and the center hole of the rod terminal) in a way that it stays with approximately 25 mm (0.98 in.).
 - (f) Safety the rod terminal nut in the adjusted position with lockwire (as applicable).

NOTE: If you removed the nut, washers, and bolt that attach the rod terminal to the structure support, install them again to attach the rod terminal back to the structure support.

- (g) If necessary, adjust the rod terminal which the condenser/mixer (13) will be installed. To do this, cut the lockwire from the rod terminal nut (as applicable).
- (h) Remove the rod terminal sufficiently to adjust its length. Apply sealant (COR-BAN 27L or CA-1000) on the rod end thread as applicable.
- (i) Adjust the length of the rod terminal (length between the base washer and the center hole of the rod terminal) in a way that it stays with 57 ± 0.5 mm (2.24 ± 0.02 in.).
- (j) Safety the rod terminal nut in the adjusted position with lockwire (as applicable).
- (k) Make sure that the total length between the center hole of the rod terminals is 150 ± 5 mm (5.9 ± 0.2 in.).

J. Installation (Figure 401)

SUBTASK 420-002-A

- (1) Put the condenser/mixer (13) in its installation position.
- (2) Push the condenser/mixer (13) to connect it to the air cycle machine (ACM) (2) duct.
- (3) Put the condenser/mixer (13) in position on the support (18) at the fuselage.
- (4) Install the bolt, washers, bushing, and nut (17) to attach the condenser/mixer (13) to the support (18). Tighten the bolt and nut.
- (5) Put the condenser/mixer (13) in position on the rod assemblies (19) and (20).
- (6) Install the bolt, washers, and nut (21) to attach the condenser/mixer (13) to the rod assemblies (19) and (20). Tighten the bolt and nut.
- (7) Put the condenser/mixer (13) in position on the rod (23).
- (8) Install the bolt, washers, and nut (22) to attach the condenser/mixer (13) to the rod (23). Tighten the bolt and nut.
- (9) Make sure that the condenser/mixer (13) is correctly aligned with the ACM turbine outlet duct.
- (10) With the clamp (15) in its installation position, use a torque wrench and apply a torque of 2.82 N.m (25 lb.in).
- (11) Connect the tube of the water collector (5) to the condenser/mixer (13).

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.

- (12) With the clamp (6) in its installation position, use a torque wrench and apply a torque of 5.65 - 6.21 N.m (50 - 55 lb.in).

NOTE: When you install the clamp (6), 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.

(13) 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 clamp (6) again.

(14) Connect the tube assembly (10) to the condenser/mixer (13).

(15) With the clamp (9) in its installation position, use a torque wrench and apply a torque of 2.82 N.m (25 lb.in).

(16) Connect the tube assembly (7) to the condenser/mixer (13).

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.

(17) With the clamp (8) in its installation position, use a torque wrench and apply a torque of 2.82 N.m (25 lb.in).

(18) Connect the tube assembly (16) to the condenser/mixer (13).

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.

(19) With the clamp (14) in its installation position, use a torque wrench and apply a torque of 5.65 - 6.21 N.m (50 - 55 lb.in).

NOTE: When you install the clamp (14), 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.

(20) 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 clamp (14) again.

(21) Connect the bonding strap (12) end to the condenser/mixer (13). Refer to [AMM TASK 20-13-21-910-801-A/200](#).

(22) Connect the electrical connectors (3) and (4) to the condenser/mixer (13).

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

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

(25) 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.

- (26) After the operational test is complete, get access to the condenser/mixer. Remove access panel 191EL or 191FR (AMM MPP 06-41-01/100).
- (27) On the Circuit Breaker Panel, open the PACK 1 and PACK 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.
- (28) Use a torque wrench and apply a torque of 5.65 - 6.21 N.m (50 - 55 lb.in) to the clamps (6) and (14) 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) Install access panel 191EL or 191FR (AMM MPP 06-41-01/100).

