AIR CYCLE MACHINE - REMOVAL/INSTALLATION

EFFECTIVITY: ALL

1. General

   A. This section gives the procedures to remove and install the air cycle machines (ACM) of the cooling pack system.

   B. These procedures are applicable to the LH and RH air cycle machines.

   C. The LH air cycle machine (ACM) is installed on the LH side of the forward lower fairing.

   D. The RH air cycle machine (ACM) 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*
21-51-03-000-801-A	AIR CYCLE MACHINE (ACM) - REMOVAL	ALL
21-51-03-400-801-A	AIR CYCLE MACHINE (ACM) - INSTALLATION	ALL

TASK 21-51-03-000-801-A
EFFECTIVITY: ALL

2. AIR CYCLE MACHINE (ACM) - REMOVAL

A. General

(1) This task gives the instructions to remove the air cycle machine (ACM).

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM TASK 21-51-00-200-801-A/200	COOLING PACK SYSTEM - GENERAL INSPECTION
AMM TASK 21-51-04-000-801-A/400	CONDENSER/MIXER - REMOVAL
AMM TASK 21-51-05-000-801-A/400	WATER COLLECTOR - REMOVAL

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).

(3) Remove the water collector (AMM TASK 21-51-05-000-801-A/400).

(4) Remove the condenser/mixer (AMM TASK 21-51-04-000-801-A/400).

J. Removal (Figure 401)

SUBTASK 020-002-A

(1) Loosen the clamps (3), (8), and (4) to disconnect the tubes (6), (7), and (5) from the air cycle machine (ACM) (1).

(2) Loosen the clamp (2) to disconnect the air cycle machine (ACM) (1) from the dual heat exchanger (REF.).

(3) Hold the air cycle machine (ACM) (1).

(4) Remove the nut (9), washers (11), and bolt (12) that attach the air cycle machine (ACM) (1) to the support (10) at the fuselage.

(5) Remove the air cycle machine (ACM) (1).

K. Follow-on

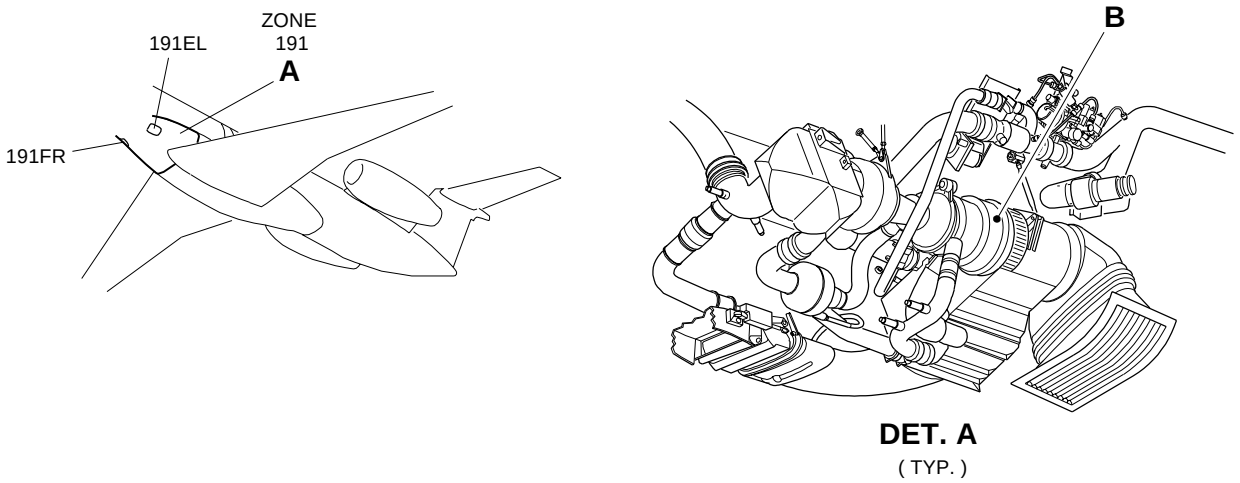
SUBTASK 200-002-A

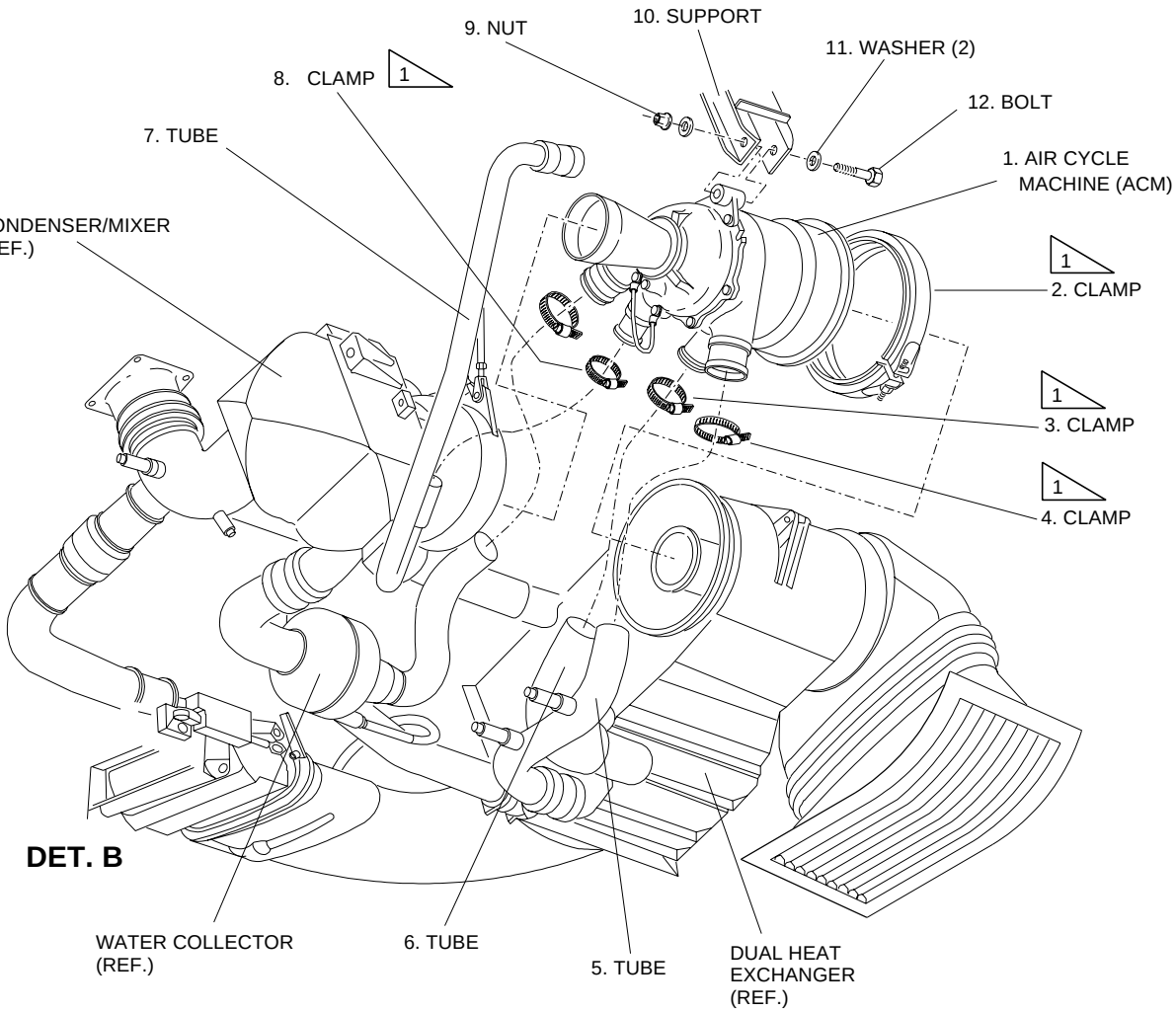
(1) Do a general inspection of the cooling pack system (AMM TASK 21-51-00-200-801-A/200).

NOTE: This inspection must be performed after removal of the air cycle machine (ACM) from the aircraft, and before installation of a new or overhauled one.

EFFECTIVITY: ALL

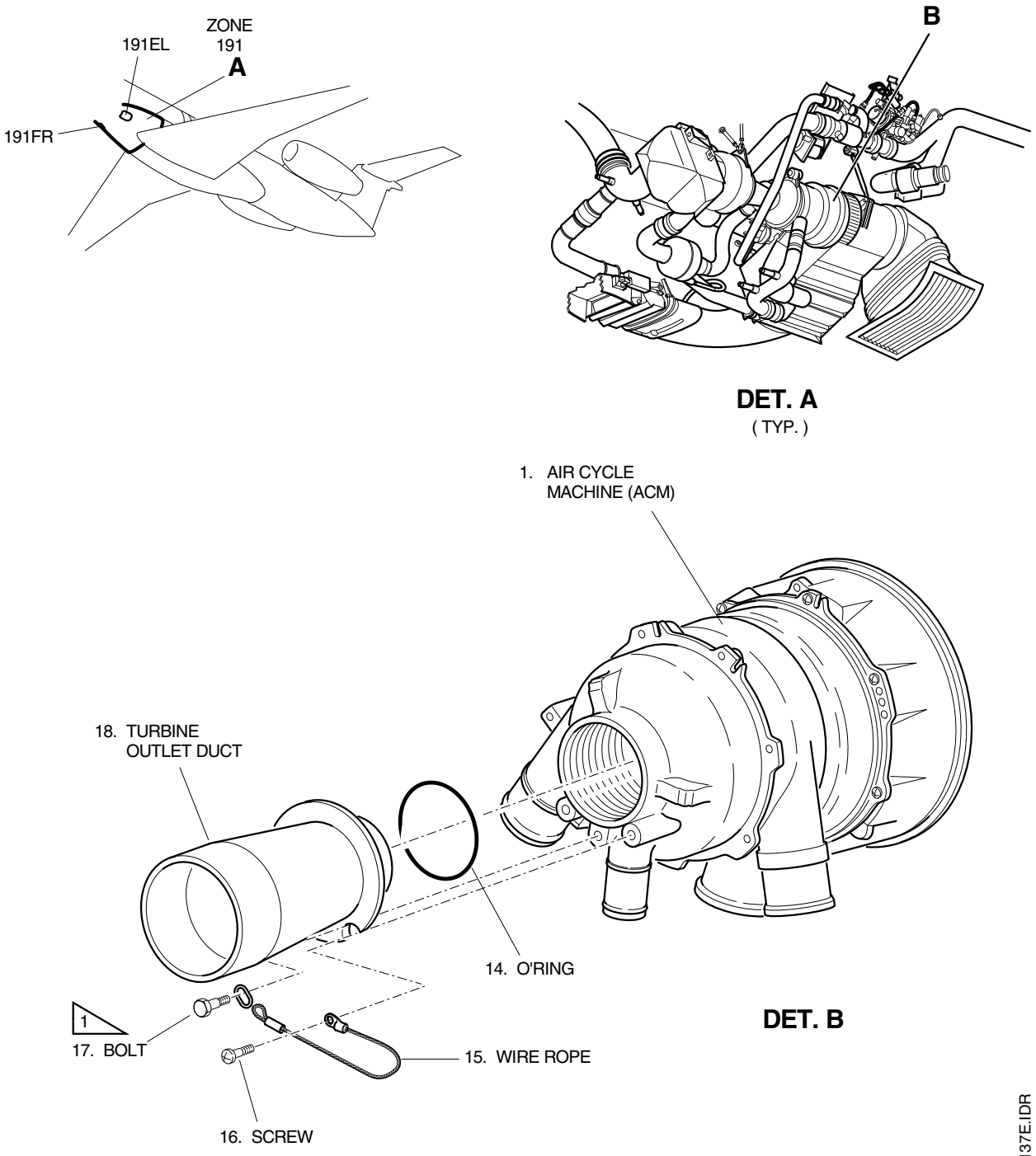
Air Cycle Machine (ACM) - Removal/Installation
Figure 401





EFFECTIVITY: ALL

Air Cycle Machine (ACM) - Removal/Installation
Figure 402



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1 TORQUE: 1.69 - 2.82 N.m (15 - 25 lb.in) MORE THAN RUNNING TORQUE.

TASK 21-51-03-400-801-A
EFFECTIVITY: ALL

3. AIR CYCLE MACHINE (ACM) - INSTALLATION

A. General

(1) This task gives the instructions to install the air cycle machine (ACM).

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM MPP 21-51-02/400	- REMOVAL/INSTALLATION
AMM MPP 21-51-14/600	- INSPECTION/CHECK
AMM TASK 21-25-01-700-801-A/500	RAM AIR VALVE - OPERATIONAL CHECK
AMM TASK 21-25-03-800-801-A/200	LINEAR ACTUATOR - ADJUSTMENT
AMM TASK 21-51-00-700-802-A/500	-
AMM TASK 21-51-02-100-801-A/700	DUAL HEAT EXCHANGER - CLEANING
AMM TASK 21-51-02-100-802-A/700	DUAL HEAT EXCHANGER - ON AIRCRAFT CLEANING
AMM TASK 21-51-03-210-801-A/600	AIR CYCLE MACHINE - ROTOR VISUAL INSPECTION
AMM TASK 21-51-04-400-801-A/400	CONDENSER/MIXER - INSTALLATION
AMM TASK 21-51-05-400-801-A/400	WATER COLLECTOR - INSTALLATION
AMM TASK 21-51-13-100-801-A/700	WATER SPRAY NOZZLE - CLEANING
AMM TASK 21-51-13-200-801-A/600	WATER SPRAY NOZZLES - INSPECTION
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	
Commercially available	Torque wrench (Range: 0-50 lb.in)	To tighten the bolt	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expendable Parts

ITEM	*IPC REFERENCE (VENDOR REFERENCE)*	*QTY*
O-ring	IPC 21-51-00	1

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 402)

SUBTASK 841-003-A

(1) Before the installation of the air cycle machine (ACM), do an inspection of the old air cycle machine (ACM) for any evidence of missing or damaged fan blades (AMM TASK 21-51-03-210-801-A/600).

(2) If any damaged fan blades are found, replace the dual heat exchanger (AMM MPP 21-51-02/400) or clean the dual heat exchanger (AMM TASK 21-51-02-100-801-A/700 or AMM TASK 21-51-02-100-802-A/700), as applicable.

(3) Prepare the air cycle machine (ACM) (1) for installation as follows:

(a) Remove the bolt (17).

(b) Remove the screw (16) and remove the wire rope (15).

(c) Remove the turbine outlet duct (18).

(d) Remove and discard the old O-ring (14).

(e) Install the new O-ring (14).

(f) Install the turbine outlet duct (18). Make sure that the turbine outlet duct (18) is correctly aligned and installed to the air cycle machine (1).

(g) Put the wire rope in position and attach it with the screw (16).

(h) Install the bolt (17) to attach the wire rope and turbine outlet duct (18) to the air cycle machine (1). Tighten the bolt (17).

(i) With a torque wrench, apply a torque of 1.69 - 2.82 N.m (15 - 25 lb.in) to the bolt (17) more than running torque.

J. Installation (Figure 401)

SUBTASK 420-002-A

CAUTION: MAKE SURE THAT THE ACM TURBINE OUTLET DUCT IS CORRECTLY ALIGNED WITH THE CONDENSER/MIXER.

(1) Put the air cycle machine (ACM) (1) on its support at the fuselage.

WARNING: MAKE SURE THAT THE AIR CYCLE MACHINE IS WITH THERMAL INSULATION INSTALLED TO PREVENT DAMAGE TO EQUIPMENT AND INJURY TO PERSONS.

(2) Install the bolt (12), washers (11), and nut (9).

(3) Install the clamp (2) to connect the air cycle machine (ACM) (1) to the dual heat exchanger (REF.).

(4) Use a torque wrench to torque the clamp (2) to 5.65 - 6.21 N.m (50 - 55 lb.in).

(5) Connect the tubes (5), (6), and (7) and attach them with the clamps (4), (3), and (8).

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.

(6) Use a torque wrench to torque the clamps (4), (3), and (8) to a torque of 5.65 - 6.21 N.m (50 - 55 lb.in).

NOTE: When you install the clamps (4), (3), and (8), 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.

(7) 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 (4), (3), and (8) again.

K. Follow-on

SUBTASK 842-002-A

(1) See the position of the ram-air flap valve to make sure that it is totally open or totally closed (AMM TASK 21-25-01-700-801-A/500). If necessary, adjust the linear actuator (AMM TASK 21-25-03-800-801-A/200).

(2) Examine the water spray nozzle for obstruction (AMM TASK 21-51-13-200-801-A/600). If necessary, clean the water spray nozzle (AMM TASK 21-51-13-100-801-A/700).

(3) Install the condenser/mixer (AMM TASK 21-51-04-400-801-A/400).

(4) Install the water collector (AMM TASK 21-51-05-400-801-A/400).

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

(6) Install access panel 191KL or 191LR (AMM MPP 06-41-01/100).

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