DUAL HEAT EXCHANGER - CLEANING/PAINTING

EFFECTIVITY: ALL

1. General

   A. This section gives the procedures to clean the dual heat exchanger.

   B. The first procedure is a shop-level cleaning procedure, and includes a visual check of the condition of the dual-heat exchanger core.

   C. The second procedure is a line/hangar-level cleaning procedure to do on the aircraft.

   D. 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*
21-51-02-100-801-A ♦	DUAL HEAT EXCHANGER - CLEANING	ALL
21-51-02-100-802-A ♦	DUAL HEAT EXCHANGER - ON AIR-CRAFT CLEANING	ALL

TASK 21-51-02-100-801-A
EFFECTIVITY: ALL

2. DUAL HEAT EXCHANGER - CLEANING

A. General

(1) This task gives the procedure to clean the dual heat exchangers.

B. References

REFERENCE	*DESIGNATION*
AMM TASK 21-51-02-000-801-A/400	DUAL HEAT EXCHANGER - REMOVAL
AMM TASK 21-51-02-400-801-A/400	DUAL HEAT EXCHANGER - INSTALLATION
Hamilton Sundstrand CMM 21-51-69	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
191	191EL	Left side of the forward wing-to-fuselage fairing
191	191FR	Right side of the forward wing-to-fuselage fairing

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Hot Water/Cleaning Solvent High-Pressure Washer	Steam-clean the core	

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Rubber Goggles	Protection for the eyes	1
Commercially available	Rubber Gloves	Protection for the hands	1
Commercially available	Safety Clothes	Prevent contact with the fluids	1

F. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
Turco 5279A or 5279ANC	Cleaning solvent	AR
Turco 5975A	Cleaning solvent	AR
Turco 5948R, 536LPH, 215, Airtec 22	Cleaning solvent	AR
Cee Bee 280	Cleaning solvent	AR
B & B C-717	Cleaning solvent	AR

(Continued)

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
NST	Cleaning solvent	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	In the forward wing-to-fuselage fairing

I. Preparation

SUBTASK 841-002-A

(1) Remove the dual heat exchangers (AMM TASK 21-51-02-000-801-A/400).

J. Cleaning of Dual Heat Exchanger and Visual Check of Core for Condition

SUBTASK 170-002-A

WARNING: USE CLOTHING AND GOGGLES TO GIVE PROTECTION WHEN YOU CLEAN THE UNIT WITH SOLVENTS AND STEAM. CLEAN IT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES OF THE SOLVENTS OR GET THEM ON YOUR SKIN OR IN YOUR EYES BECAUSE THEY CAN CAUSE IRRITATION. STEAM AND COMPRESSED AIR CAN CAUSE INJURY FROM AIRBORNE PARTICLES.

CAUTION: DURING ALL PROCEDURES IN WHICH YOU USE PRESSURIZED AIR, STEAM, OR LIQUIDS TO CLEAN DUCTS AND PASSAGES, BE CAREFUL NOT TO CAUSE DAMAGE TO THE FINS WITH THE WASHER OR ITS FLOW.

(1) Before you clean the unit, examine the core to know if there are bent fins. Badly bent fins decrease the flow of air through the core and make it difficult to clean the unit fully.

(2) Flow all loose particles out of the core with clean, dry, compressed air at 30 psi. Blow the air in from the exhaust, which is the clean end, through to the inlet, which is the dirty end.

(3) Steam-clean the core as follows:

CAUTION: USE ONLY AGENTS WHICH WILL NOT CAUSE DAMAGE TO ALUMINUM. AGENTS THAT ARE SAFE TO USE ARE SPECIFIED IN THE "CONSUMABLE MATERIALS" SECTION. BECAUSE WE DO NOT CLEAN CONDENSER AND MIXERS WE CANNOT MAKE AN ANALYSIS OF OTHER AGENTS THAT YOU CAN USE.

(a) Use your own hot-water high-pressure washer or a model recommended by the manufacturer in "Tools and Equipment".

(b) Adjust the washer wand for steam and a 1% (by volume) solution of Turco 5279A or 5279ANC and water. Refer to "Consumable Materials" for alternative agents.

(c) Flush the steam and detergent solution through the core from the exhaust (clean) end through to the inlet (dirty) end. Continue the flow of solution until it comes out of the inlet.

(d) Stop the flow of Turco solution and continue to send steam through the core to flush away the Turco solution.

(4) Fully soak the unit in a 17% (by volume) solution of Turco 5975A and water for 24 hours at room temperature. Refer to "Consumable Materials" for alternative agents. For the best results, keep the solution constantly mixed.

NOTE: The soak clean step is optional. You can decrease the time of the soak or not include the step if the unit is satisfactorily clean without it.

(5) Flush the core, ducts, and surfaces of the unit with clean, room-temperature water to make sure that you remove all of the detergent.

(6) Drain the unit and turn it as necessary to remove as much water as possible.

(7) Let the unit air-dry.

(8) After cleaning, do leakage and pressure drop tests for the unit. Refer to the latest revision of Hamilton Sundstrand CMM 21-51-69.

K. Follow-on

SUBTASK 842-002-A

(1) Install the dual heat exchangers (AMM TASK 21-51-02-400-801-A/400).

TASK 21-51-02-100-802-A
EFFECTIVITY: ALL

3. DUAL HEAT EXCHANGER - ON AIRCRAFT CLEANING

A. General

WARNING: DURING THE CLEANING PROCEDURE, PREVENT CONTACT WITH THE CLEANING SOLUTION AND DO NOT BREATHE ITS VAPORS OR MISTS. DO THIS PROCEDURE IN A WELL VENTILATED AREA.

- **PUT ON SAFETY CLOTHES, GOGGLES, AND GLOVES.**

CAUTION: BEFORE YOU START THIS PROCEDURE, MAKE SURE THAT THE ECS IS OFF AND THAT THE HEAT EXCHANGER COOLED TO A MINIMUM OF 23°C (41.4°F) BELOW THE FLASH POINT OF THE CLEANING SOLUTION IN USE. REFER TO THE MATERIAL SAFETY DATA SHEET (MSDS) OF THE SOLVENT IN USE TO GET THE FLASH POINT.

(1) This task gives the procedure to clean the dual heat exchangers on the aircraft.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM TASK 28-41-00-200-801-A/600	-
CMM 21-51-69 (Hamilton Standard)	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
191	191EL	Left side of the forward wing-to-fuselage fairing
191	191FR	Right side of the forward wing-to-fuse-lage fairing
191	191GL	Bottom of the forward wing-to-fuselage fairing

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Hot Water/Cleaning Solvent High Pres-sure Washer	To reverse flow flush the heat exchanger ram air circuit	
Commercially available	Adjustable or Straight Hose with 90° Bend at Tip (Approx. 3 ft long)	To access/apply cleaning solution with High Pressure Washer	

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Rubber Goggles	Protection for the eyes	1

(Continued)

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Rubber Gloves	Protection for the hands	1
Commercially available	Safety Clothes	Prevent contact with the fluids	1

F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
Mirachem 500	Cleaning solvent	AR
Cee Bee 280	Cleaning solvent	AR
Envirosolv 652	Cleaning solvent	AR
B & B C-717	Cleaning solvent	AR
ARDROX 1900B	Cleaning solvent	AR

G. Expendable Parts

ITEM	IPC REFERENCE (VENDOR REFERENCE)	QTY
Protective plug	CMM 21-51-69 (Hamilton Standard)	AR

H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	In the forward wing-to-fuselage fairing
1	Helps with the task	In the forward wing-to-fuselage fairing

I. Preparation (Figure 701) (Figure 702)

SUBTASK 841-003-A

(1) On the overhead circuit breaker panel, open the circuit breakers below and attach DO-NOT-CLOSE tags to them:

- PACK 1 (Location tip: DC BUS 1/AIR COND/PNEU/PACK 1).
- PACK 2 (Location tip: DC BUS 2/AIR COND/PNEU/PACK 2).
- RAM AIR (Location tip: ESSENTIAL DC BUS 1/AIR COND/PNEU/RAM AIR).

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

(3) Through the access 191EL and 191FR (Figure 701):

- Loosen the clamps (1) and move apart the connections.
- Loosen the clamps (2) and move apart the couplings.
- Disconnect the electrical connectors (3).

(4) Remove access panel 191GL (AMM MPP 06-41-01/100).

(5) Remove the protective plug from the fan-inlet diffuser housing (FIDH) (Figure 702) to show 2" diameter clean-out access hole.

NOTE: Do an inspection on the protective plug to know if it is necessary to replace it. If it is in good condition, keep it.

(6) Prepare the cleaning solution with one of the cleaning solvents listed in Consumable Materials table above. The recommended concentrations for all cleaning solvents are:

- 1 part cleaning solvent with 5 to 10 parts water for light to moderate soils.
- 1 part cleaning solvent with 2 to 5 parts water for heavy soils.
- 1 part cleaning solvent with 1 to 4 parts water for heavy soils, grease, and carbon deposits.

J. Clean Dual Heat Exchanger on the Aircraft

SUBTASK 170-003-A

(1) Opposite flow flush the ram air circuit (heat exchanger core), from the FIDH access hole to the ram air inlet face, with the use of the cleaning solution at a pressure of 20 to 30 PSIG, for a minimum of 10 minutes.

(2) Make sure that the full core face surface is flushed.

(3) Fully flush the solvent from the ram air circuit (heat exchanger core), from the FIDH access hole to the ram air inlet face, with the use of clean water only, at 30 PSIG maximum pressure.

(4) Continue water flush until the water is clean as it exits the ram air inlet face of the heat exchanger.

(5) Blow dry with clean air.

NOTE: You can use a dry compressed air source with a maximum pressure of 30 psi.

(6) Make sure that the aircraft ram-air inlet duct is free of residual water and debris.

K. Follow-on (Figure 701) (Figure 702)

SUBTASK 842-003-A

(1) Install the protective plug on the fan-inlet diffuser housing (FIDH) access hole (Figure 702).

(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 panel 191GL (AMM MPP 06-41-01/100).

(4) Through the access 191EL and 191FR (Figure 701):

- Attach the connections and tighten the clamps (1) to the torque shown in (Figure 701).
- Attach the couplings and tighten the clamps (2).
- Connect the electrical connectors (3).

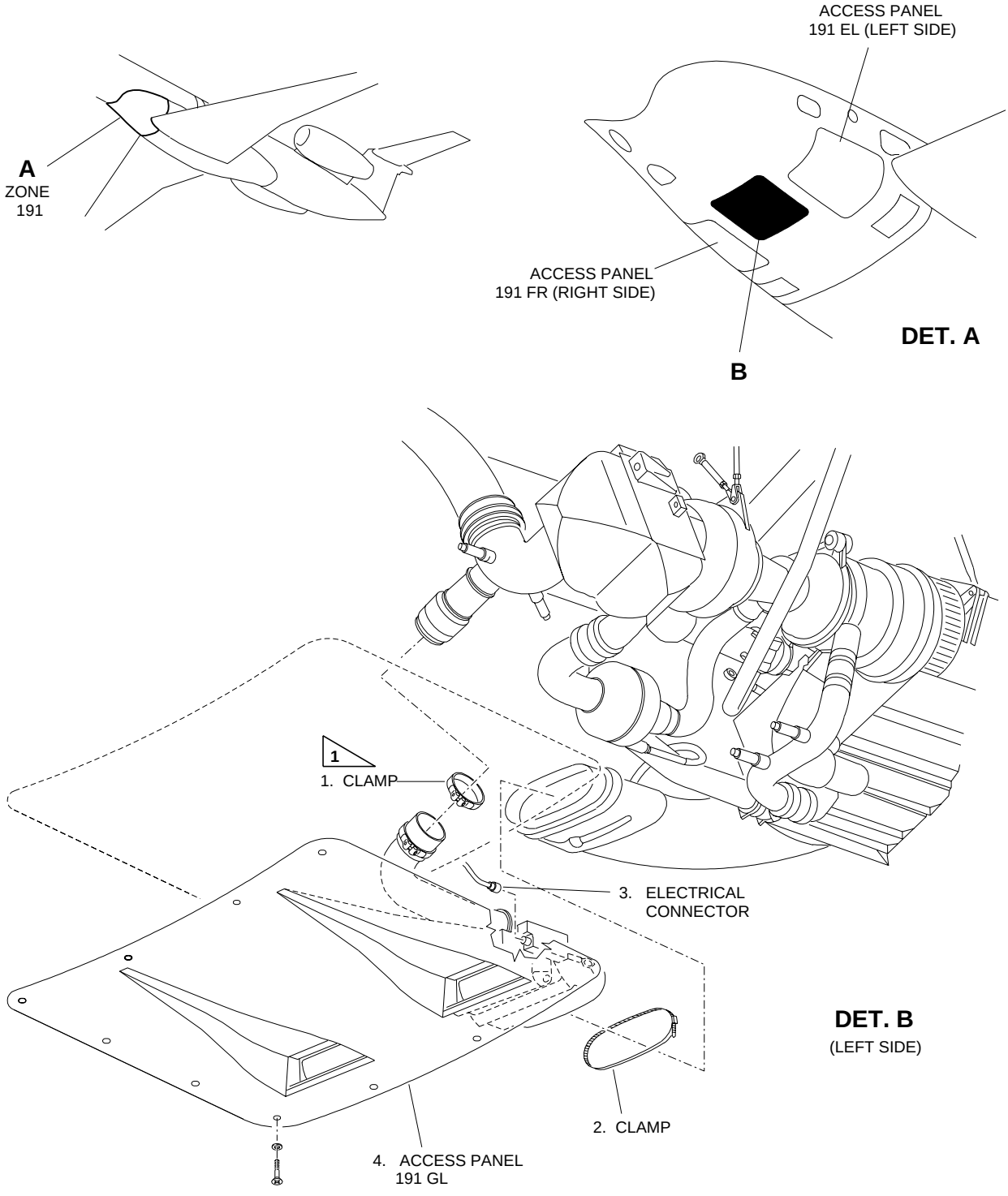
(5) Install access panels 191EL and 191FR (AMM MPP 06-41-01/100).

(6) On the overhead circuit breaker panel, remove the DO-NOT-CLOSE tags from the circuit breakers below and close them:

- PACK 1 (Location tip: DC BUS 1/AIR COND/PNEU/PACK 1).
- PACK 2 (Location tip: DC BUS 2/AIR COND/PNEU/PACK 2).
- RAM AIR (Location tip: ESSENTIAL DC BUS 1/AIR COND/PNEU/RAM AIR).

EFFECTIVITY: ALL

Access Panel 191GL - Removal/Installation
Figure 701



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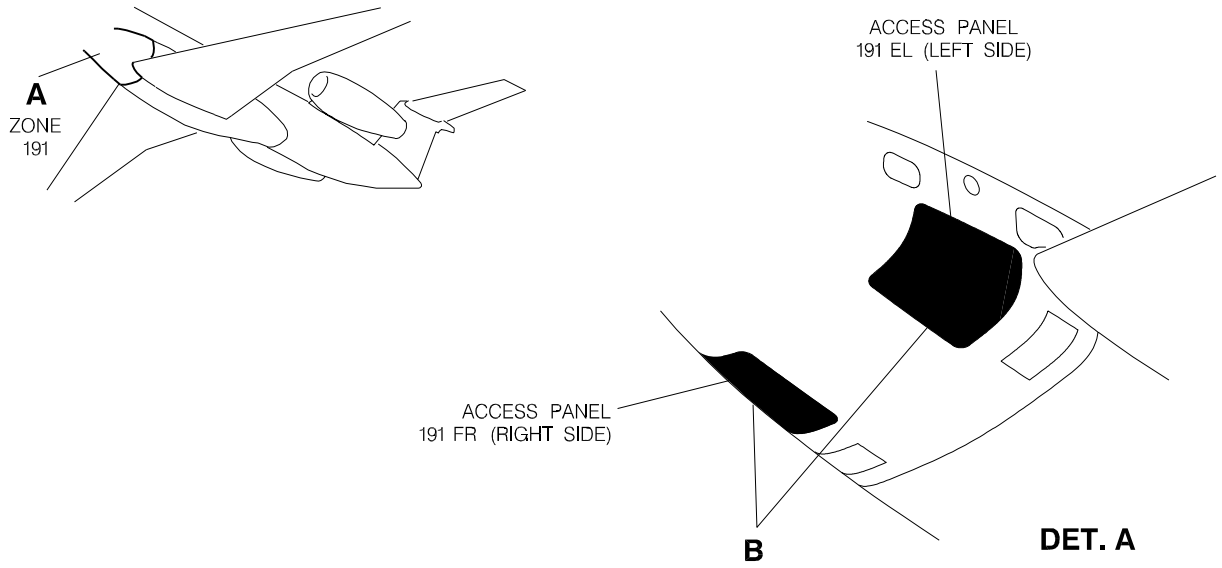
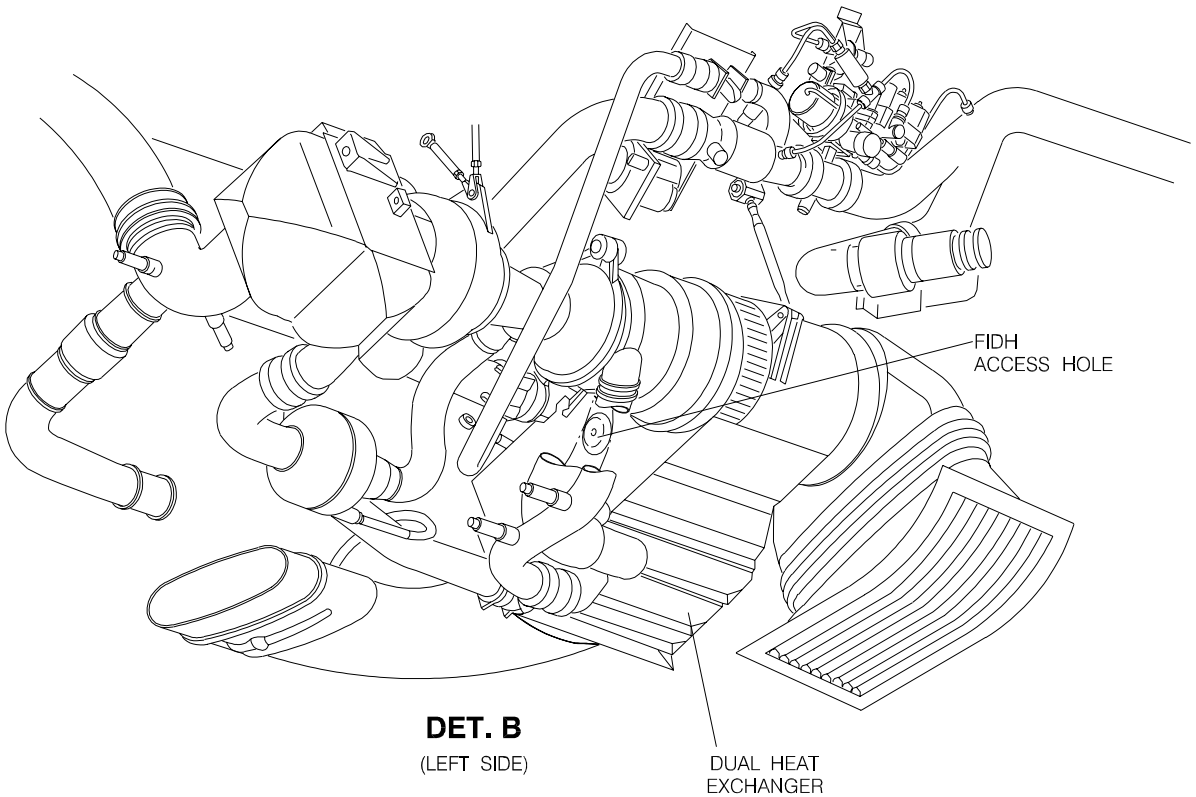
EFFECTIVITY: ALL
Dual Heat Exchanger - Cleaning Access
Figure 702





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