03.117 TCCS Auxiliary Fan Swapout
(03. HSS)

OBJECTIVE:

To replace the auxiliary (aux) cabin fan on the Trace Contaminant Control Subassembly (TCCS).

EQUIPMENT:

1x Orange caution cone
5/32 T-handle Allen wrench (will be gathered during the procedure)
Auxiliary cabin fan (will be gathered during the procedure)
Flashlight
Large flat head screwdriver
Magnetic dish
Phillips screwdriver
Portable anemometer
PPE Kobalt work gloves
PPE safety glasses
PPE static wrist tether
Shop vacuum

REFERENCES:
Air Flow Tracking Spreadsheet
Serial Number Tracking Spreadsheet

NOTE
Starting MD16, when this procedure calls for you to request authorization from MCC for an action, you may proceed on your own go.

NOTE
A backup main fan is not on station. Only a backup auxiliary cabin fan is available in case of any failure. The TCCS may require the use of the auxiliary cabin fan for proper operation in case of a main fan failure. If an auxiliary fan fails and is no longer circulating the cabin air, it must be replaced. For this procedure, substitute Aux Fan 1 or 2 depending on which fan has failed.

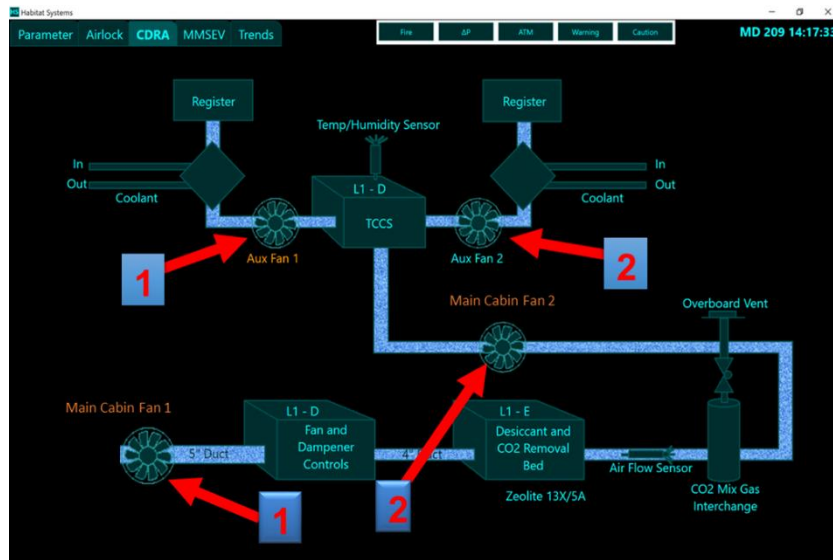1.   DEACTIVATE MAIN CABIN FANS (IF ACTIVATED)

Figure 1: HSS Main Cabin Fan Power

1.1 On HSS CDRA display, touch Main Cabin Fan 1 icon to deactivate fan (see Figure 1).

Verify fan has audibly shutoff.

1.2 On HSS CDRA display, touch Main Cabin Fan 2 icon to deactivate fans (see Figure 1).

Verify fan has audibly shutoff.

GMWS 2. DEACTIVATE AUX CABIN FANS (IF ACTIVATED)

2.1 On HSS CDRA display, touch Aux Cabin Fan 1 icon to deactivate fans (see Figure 1).

Verify fan has audibly shutoff.

2.2 On HSS CDRA display, touch Aux Cabin Fan 2 icon to deactivate fans (see Figure 1).

Verify fan has audibly shutoff.

Figure 2: Trace Contaminant Control Subassembly (TCCS) Panel

    2.3   On TCCS Panel, flip power switches of Aux Cabin Fan 1 to "OFF" (see Figure 2).

    2.4   On TCCS Panel, flip power switches of Aux Cabin Fan 2 to "OFF" (see Figure 2).

NOTE
Move stowage as necessary in order to access the TCCS Panel.

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3.   <u>DEACTIVATE FAN DAMPENER ASSEMBLY (FDA) PUMP (IF ACTIVATED)</u>

    3.1   Remove by sliding floor panel 1D and temp stow. Place orange caution cone next to opening.

    3.2   Don static wrist tether and attach to any unpainted metallic surface.

    3.3   Don PPE gloves and safety glasses.

NOTE
Read step 3.5 before executing 3.4. Step 3.5 is time dependent and can be missed if not actively watching the Dampener Dial Indicator.

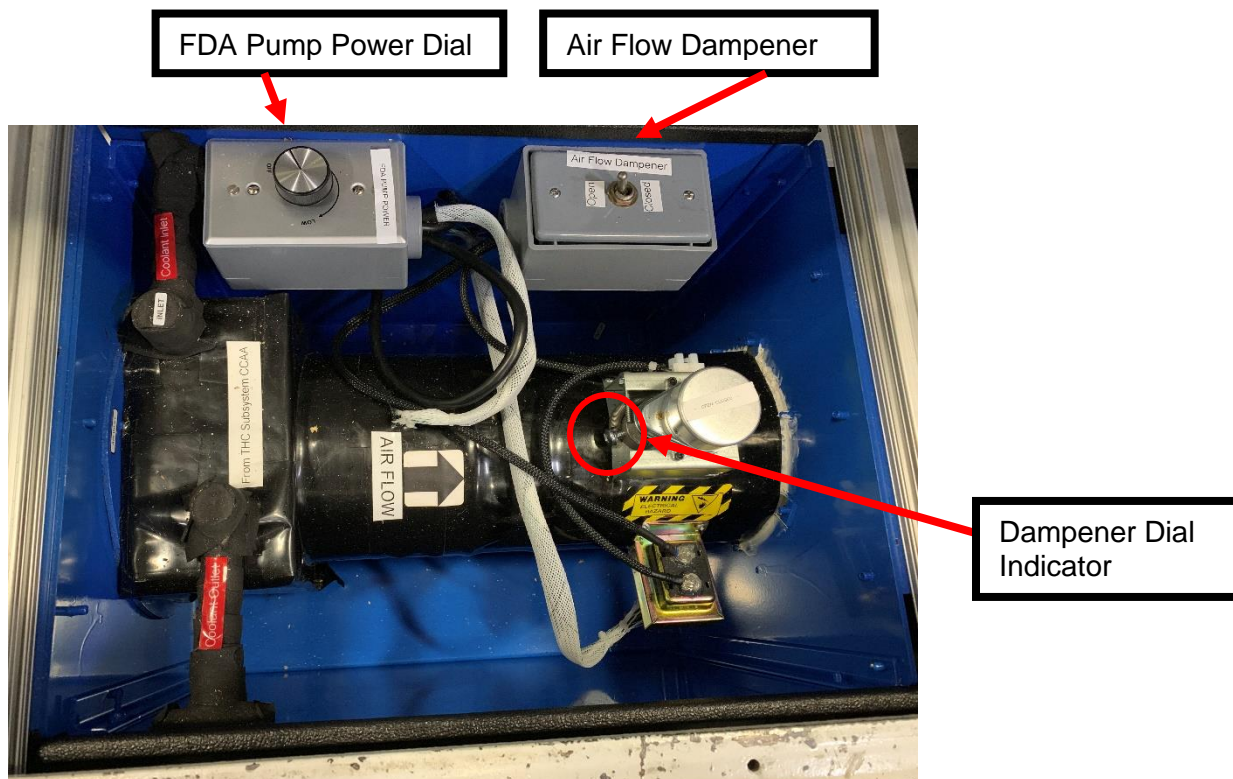FDA Pump Power Dial

Air Flow Dampener

Dampener Dial Indicator

Figure 3: Fan Dampener Assembly (FDA) Pump

3.4 Turn FDA Pump Power Dial counterclockwise to "OFF". Listen for a click (see figure 3).

3.5 Flip Air Flow Dampener switch to "CLOSED" (see figure 3).

3.6 Confirm Dampener Dial Indicator (metal Philips head screw with spring attached) rotates to fully closed (see figure 3).

3.7 Detach static wrist tether.

ALC 4. GATHER 5/32 T-HANDLE ALLEN WRENCH

Figure 4: 5/32 T-handle Allen Wrench

4.1 Remove 5/32 T-handle Allen wrench from Airlock Toolbox (see Figure 4).

L1D   5.   <u>REMOVE USED AUXILIARY CABIN FAN</u>

    5.1   Attach static wrist tether to an unpainted metallic surface.

    5.2   On TCCS panel, use Phillips screwdriver to remove Phillips screws and temp stow in magnetic dish (see Figure 2).

<u>NOTE</u>
Disconnecting the affected 12VDC (Direct Current Voltage) cable from the quick disconnect socket, allows for better ease to temp stow the TCCS panel.

    5.3   Disconnect affected Aux Cabin Fan 1 (2) 12VDC Power Cable from Aux Cabin Fan 1/2 quick disconnect.

    5.4   Remove TCCS Panel and temp stow. See figure 2.

    5.5   Inspect TCCS with flashlight for debris and clean as necessary with shop vacuum.

    5.6   Use flathead screwdriver to loosen hose ring clamp downstream of used Aux Cabin Fan 1 (2).

Figure 5: Top Retaining Hex Bolts for Auxiliary Cabin Fans 1 (2)

    5.7   Use 5/32 T-handle Allen wrench to remove hex head bolt 1 and loosen hex head bolt 2 stabilizing Aux Cabin Fan 1 (2). (See Figure 5.)

    5.8   Temp stow retaining hex head bolts and nuts in magnetic dish and 5/32 T-handle Allen wrench.

5.9   If replacing Aux Cabin Fan 1 (2):

{Disconnect Aux Cabin Fan 1 from hose assembly by pulling the fan up until hex head bolt 2 and nut are free of retaining bracket, then rotate the fan clockwise while pushing up to remove fan out of the hose assembly}

NOTE
There are 4 spade connectors for each aux cabin fan. The 4th spade connector connects the 12VDC cable to the TCCS front panel switch. Leave this spade connector alone.

5.10 Disconnect Aux Cabin Fan 1 (2) from 12VDC cable QTY 3 spade connectors (see Figure 6).
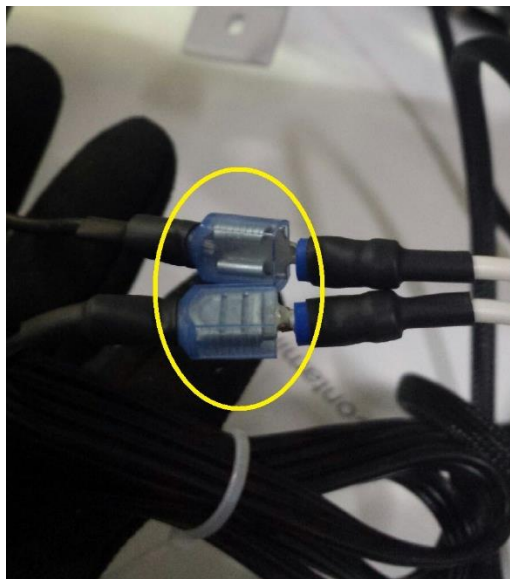

Figure 6: Auxiliary Cabin Fan Tug Connectors

5.11 Record used Aux Cabin Fan 1 (2) S/N in Serial Number Tracking Spreadsheet.

5.12 Detach static wrist tether from metallic surface.

ALD   6.   RETRIEVE NEW AUXILIARY CABIN FAN

6.1   Remove spare Aux Cabin Fan from airlock module drawer ALC-L02.

6.2   Inspect spare Aux Cabin Fan with flashlight for damage/debris.

6.3   Return used Aux Cabin Fan to airlock module drawer ALC-L02 where spare Aux Cabin Fan previously resided.

L1D   7.   INSERT CLEAN AUXILIARY CABIN FAN

7.1   Attach static wrist tether to an unpainted metallic surface.

7.2 Check spare Aux Cabin Fan has same airflow direction as TCCS.

NOTE
Hex head bolt 2 needs the retaining nut to be attached (loose not tight) in order to properly slide into the 80/20 aluminum support bracket.

7.3 If replacing Aux Cabin Fan 1 (2):

{Connect Aux Cabin Fan 1 (2) to hose assembly by rotating the fan counterclockwise while pushing the fan down until the fan is inside the upstream duct. Then push the fan down slightly and slide hex head bolt 2 into the retaining bracket.}

7.4 Attach the downstream hose and hose clamp over the replacement fan.

7.5 Use 5/32 T-handle Allen wrench to tighten retaining hex head bolts stabilizing Aux Cabin Fan 1 (2).

7.6 Confirm the retaining hex head bolts are engaged in the retaining nuts.

7.7 Use flathead screwdriver to tighten hose ring clamp on side of new Aux Cabin Fan 1 (2).

7.8 Record Spare Aux Cabin Fan 1 (2) S/N for filter assembly in Serial Number Tracking Spreadsheet.

7.9 Connect Aux Cabin Fan 1 (2) to TCCS Panel QTY 3 spade connectors.

7.10 Confirm the spade connectors are connected correctly: green to green, white to white, black to black (spade connectors are also keyed).

7.11 Connect Aux Cabin Fan 1 (2) 12VDC power cable to Cabin Fan 1 (2) quick disconnect.

7.12 Retrieve and reattach TCCS control panel.

7.13 Detach static wrist tether from metallic surface.

L1D 8. <u>TEST NEW AUXILIARY CABIN FAN</u>

8.1 On TCCS Panel, activate Aux Cabin Fan 1 and Aux Cabin Fan 2 (See Figure 2).

8.2 On HSS CDRA display, touch Aux Cabin Fan 1 and Aux Cabin fan 2 icon to activate fan (see Figure 1).

8.3 Check hose assembly on each side of Aux Cabin Fan 1 (2) for air leaks.
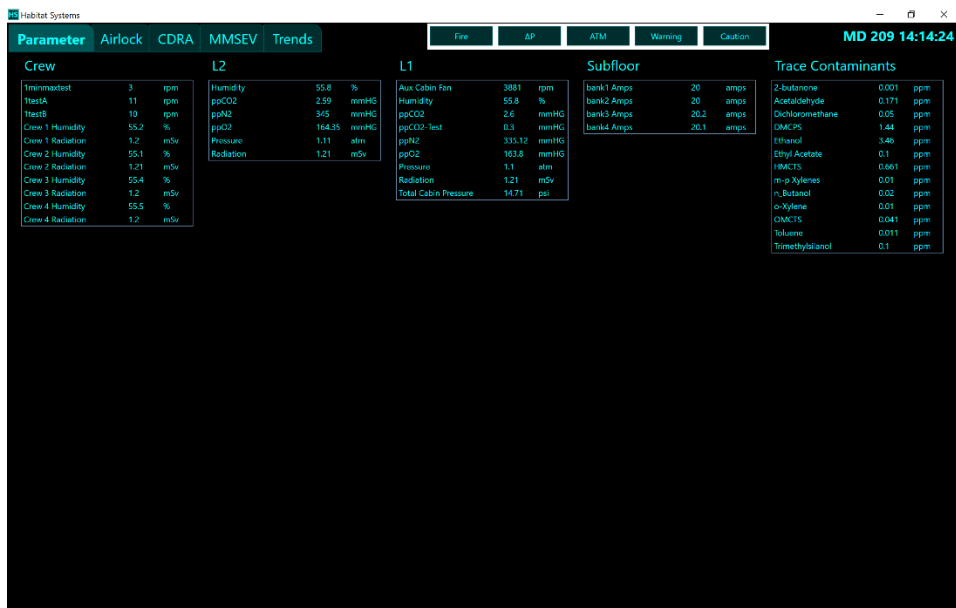
Figure 7: HSS Parameter display

8.4   Verify good telemetry via HSS Parameter display (See Figure 7).

8.5   On HSS CDRA display, touch Aux Fan 1 (2) icon to deactivate.

L1D Subf   9.   <u>ACTIVATE FDA PUMP</u>

<u>NOTE</u>
FDA Pump Power Dial can be set from Low to High. When on, always leave dial set to Mid-point.

9.1   Go to the opened Floor Panel 1D and flip Air Flow Dampener switch to "OPEN" (see Figure 3).

9.1.1 Check that the Dampener Dial Indicator (metal Philips head screw with spring attached) rotates to fully open.

9.2   Turn FDA Pump Power Dial to "ON" by rotating clockwise. After hearing click, stop rotation at Midpoint.

L1F Subf   10.   <u>ACTIVATE MAIN CABIN FANS</u>

10.1 On HSS CDRA display, touch Main Cabin Fan 1 icon to activate fan (see Figure 1).

-Verify fan has audibly turned on.

10.2 On HSS CDRA display, touch Main Cabin Fan 2 icon to activate fan (see Figure 1).

-Verify fan has audibly turned on.

10.3 Replace floor panel 1D and safely latch.

11. ACTIVATE AUXILLIARY CABIN FANS

11.1 On HSS CDRA Display, touch Aux Cabin Fan 1 icon to activate fan (see Figure 1).

-Verify fans have audibly turned on.

11.2 On HSS CDRA Display, touch Aux Cabin Fan 2 icon to activate fan (see Figure 1).

- Verify fans have audibly turned on and proceed to step 12.

12. CDRA VENT CHECK

Figure 8: Cabin Output Vent C/D and Cabin Output Vent D/E

12.1 Gather portable anemometer and take reading in m/s of exhaust flow at cabin output vents C/D and D/E (Figure 8). Hold anemometer within an inch of the vent for 20 seconds to gather an accurate reading and record the highest reading on the Airflow Tracking Spreadsheet.

12.2 Confirm airflow is within expected range by reporting the flow. (Reading should be greater than 0.5 m/s.)

12.3 Doff PPE Kobalt work gloves, safety glasses, and static wrist tether.

12.4 Stow all equipment including orange caution cones.