

03.117 TCCS Auxiliary Fan Swapout

(03. ECLSS)

OBJECTIVE:

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

EQUIPMENT:

Auxiliary cabin fan (will be gathered during the procedure)
Cabin fan release tool (will be gathered during the procedure)
Phillips screwdriver
Large flat head screwdriver
Flashlight
Shop vacuum
Portable anemometer
PPE safety glasses
PPE Kobalt work gloves
PPE static wrist tether
Orange caution cone 2x

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.

L1F Subf 1. DEACTIVATE MAIN CABIN FANS (IF ACTIVATED)

- 1.1 Don PPE gloves and safety glasses.
- 1.2 Remove floor panel 1F and temp stow. Place orange caution cone close to opening.



Figure 1: Cabin Fan Power Switches

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- 1.3 On Main Cabin Fan, pull switch out and push toward "OFF" to deactivate fan (see Figure 1).

Verify fan has audibly shutoff.

- 1.4 On Secondary Cabin Fan, pull switch out and push toward "OFF" to deactivate fan (see Figure 1).

Verify fan has audibly shutoff.

GMWS 2. DEACTIVATE AUX CABIN FANS (IF ACTIVATED)

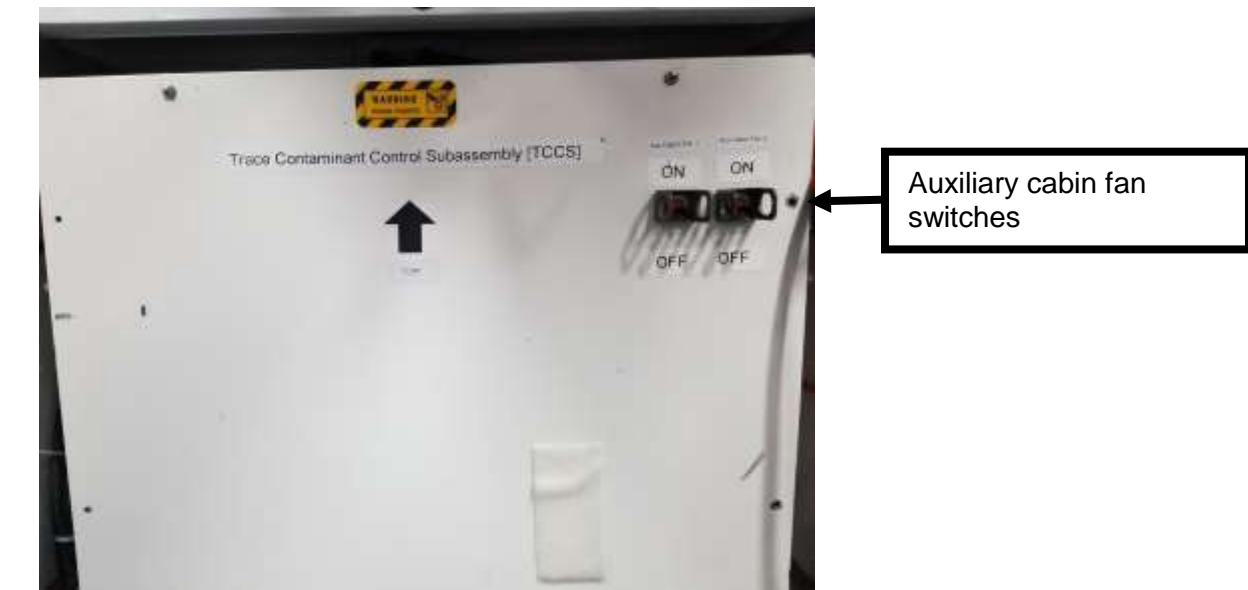


Figure 2: Trace Contaminant Control Subassembly (TCCS) Panel

- 2.1 On TCCS Panel, check power switches of Aux Cabin Fan 1 and Aux Cabin Fan 2 are "OFF" (see Figure 2).

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

2.1.2 If power switches of Aux Cabin Fan 1 and Aux Cabin Fan 2 are **NOT** "OFF", flip each switch to "OFF".

L1D Subf 3. DEACTIVATE FAN DAMPENER ASSEMBLY (FDA) PUMP (IF ACTIVATED)

- 3.1 Remove 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.

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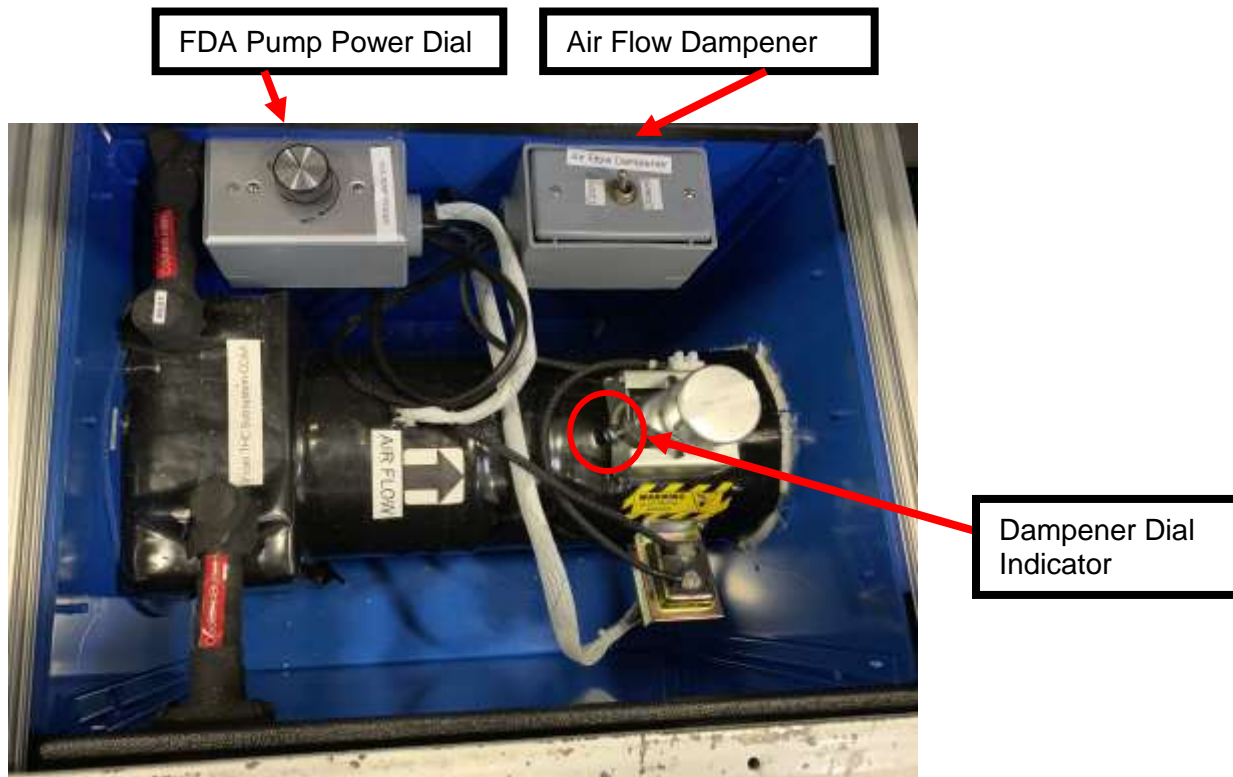


Figure 3: Fan Dampener Assembly (FDA) Pump

3.3 Turn FDA Pump Power Dial counterclockwise to “OFF”. Listen for a click.

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.

3.4 Flip Air Flow Dampener switch to “CLOSED”.

3.5 Confirm Dampener Dial Indicator (metal Philips head screw with spring attached) rotates to fully closed.

3.6 Detach static wrist tether.

ALC 4. GATHER CABIN FAN RELEASE TOOL

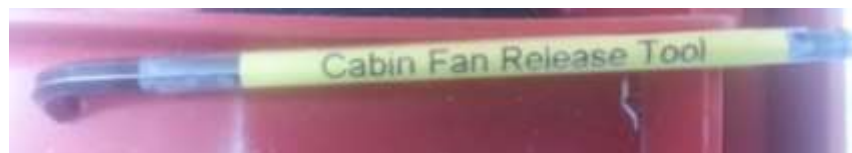


Figure 4: Cabin Fan Release Tool

4.1 Remove Cabin Fan Release Tool from Airlock Toolbox (see Figure 4).

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5. REMOVE USED AUXILIARY CABIN FAN

- 5.1 Don static wrist tether and attach to unpainted metallic surface.
- 5.2 On TCCS, use Phillips screwdriver to remove Phillips screws and temp stow (see Figure 2).

NOTE

Disconnecting both 12VDC (Direct Current Voltage) cables from the quick disconnects, allows for better ease to temp stow the TCCS panel.

- 5.3 Disconnect Aux Cabin Fan 1 12VDC Power Cable from Aux Cabin Fan 1 quick disconnect.
- 5.4 Disconnect Aux Cabin Fan 2 12VDC Power Cable from Aux Cabin Fan 2 quick disconnect.
- 5.5 Remove TCCS Panel and temp stow.
- 5.6 Inspect TCCS with flashlight for debris and clean as necessary with shop vacuum.
- 5.7 Use flathead head screwdriver to loosen hose ring clamp downstream of used Aux Cabin Fan 1 (2).



Figure 5: Top Retaining Hex Bolts for Auxiliary Cabin Fan

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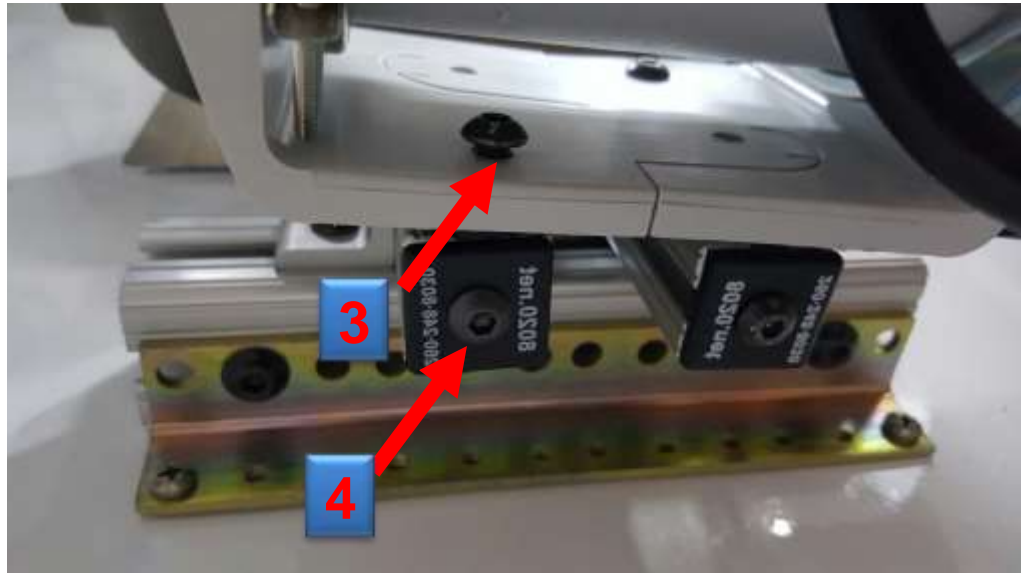


Figure 6: Bottom Retaining Hex Bolts for Auxiliary Cabin Fan

5.8 Use cabin fan release tool to remove hex head bolts 1 and 4. Loosen retaining hex head bolts 2 and 3 stabilizing Aux Cabin Fan 1 (2). (See Figures 5 and 6.)

5.9 Temp stow retaining hex head bolts and cabin fan release tool.

5.10 If replacing Aux Cabin Fan 1:

{Disconnect Aux Cabin Fan 1 from hose assembly by pushing the fan down until hex head bolt 3 is free of retaining bracket, then rotate the fan clockwise while pushing up to remove fan out of the hose assembly}

If replacing Aux Cabin Fan 2:

{Disconnect Aux Cabin Fan 2 from hose assembly by pushing the fan down until hex head bolt 3 is free of retaining bracket, then rotate the fan counterclockwise while pushing up to remove fan out of the hose assembly}

NOTE

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

5.11 **On MCC GO**

Disconnect Aux Cabin Fan 1 (2) from 12VDC cable QTY 3 tug connectors (see Figure 7).

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Figure 7: Auxiliary Cabin Fan Tug Connectors

5.12 Notify MCC of used Aux Cabin Fan 1 (2) S/N.

5.13 Doff static wrist tether or detach from metallic surface.

ALD

6. RETRIEVE NEW AUXILIARY CABIN FAN

6.1 Remove spare Aux Cabin Fan from airlock module wall D.

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

6.3 Return used Aux Cabin Fan to airlock module wall D where spare Aux Cabin Fan previously resided.

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7. INSERT CLEAN AUXILIARY CABIN FAN

7.1 Don static wrist tether and attach to unpainted metallic surface.

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

NOTE

Hex head bolt 3 needs the retaining nut to have no extra threads seen below the nut (loose not tight) in order to properly slide into the 80/20 aluminum support bracket.

7.3 If replacing Aux Cabin Fan 1:

{Connect Aux Cabin Fan 1 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 3 into the retaining bracket.}

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If replacing Aux Cabin Fan 2:

{Connect Aux Cabin Fan 2 to hose assembly by rotating the fan clockwise while pushing the fan down until the fan is inside the upstream duct. Then push the fan down slightly and slide hex head bolt 3 into the retaining bracket.}

- 7.4 Attach the downstream hose and hose clamp over the replacement fan.
- 7.5 Use cabin fan release tool 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 head screwdriver to tighten hose ring clamp on side of new Aux Cabin Fan 1 (2).
- 7.8 Notify MCC of Spare Aux Cabin Fan 1 (2) S/N for filter assembly.
- 7.9 Connect Aux Cabin Fan 1 (2) to TCCS Panel QTY 3 tug connectors.
- 7.10 Confirm the tug connectors are connected correctly: green to green, white to white, black to black.
- 7.11 Connect Aux Cabin Fan 1 12VDC power cable to Cabin Fan 1 quick disconnect.
- 7.12 Connect Aux Cabin Fan 2 12VDC power cable to Cabin Fan 2 quick disconnect.
- 7.13 Doff static wrist tether or detach from metallic surface.

L1D 8. TEST CLEAN AUXILIARY CABIN FAN

- 8.1 Don static wrist tether and attach to unpainted metallic surface.
- 8.2 On TCCS Panel, flip power switch of Aux Cabin Fan 1 and Aux Cabin Fan 2 to "ON".
- 8.3 Check Aux Cabin Fan 1 and 2 set to On.
- 8.4 Check hose assembly on each side of Aux Cabin Fan 1 and 2 for air leaks.
- 8.5 Check MCC (to confirm good telemetry with ECLSS).
- 8.6 **On MCC GO**

On TCCS Panel, flip power switch of Aux Cabin Fan 1 and Aux Cabin Fan 2 to "OFF"
- 8.7 Retrieve TCCS Panel and secure panel with Phillips screws and Phillips screwdriver.

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L1D Subf 9. ACTIVATE FDA PUMP

NOTE

FDA Pump Power Dial can be set from Low to High. When on, always leave dial set to high.

9.1 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.

L1F Subf 10. ACTIVATE MAIN CABIN FANS

10.1 On Main Cabin Fan, pull switch out and push toward “ON” to activate fan (see Figure 1).

Verify fan has audibly turned on.

10.2 On Secondary Cabin Fan, pull switch out and push toward “ON” to activate fan (see Figure 1).

Verify fan has audibly turned on.

10.3 Replace floor panel 1F and safely latch and proceed to step 11.

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11. ECLSS Vent Check



Figure 8: Cabin Output Vent C/D

Figure 9: Cabin Output Vent D/E

- 11.1 Gather portable anemometer and take reading in m/s of exhaust flow at cabin output vents C/D and D/E (Figures 8 and 9). Hold anemometer within an inch of the vent for 10 seconds to gather an accurate reading and report the highest reading to MCC.
- 11.2 Call MCC to confirm air flow is within expected range by reporting the flow. (Reading should be greater than 0.5 m/s.)
- 11.3 **On MCC GO**, relocate floor panel 1D and safely latch.
- 11.4 Doff PPE Kobalt work gloves, static wrist tether, and safety glasses.
- 11.5 Stow all equipment including orange caution cones.