

29 JAN 10

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List of Implemented CR(s):

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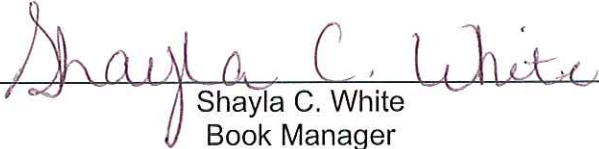
Uplinked Messages (or Approved Flight Notes) replaced by this PCN, remove from Book:

None

Incorporates the following:

1. Replace cover
2. Replace iii thru xvi
3. After 188, add 188a thru 188d
Replace 261 thru 266, 321 thru 362; after 362, add 362a thru 362d
Replace 393 thru 410, 433 thru 448, 491 thru 496

APPROVED BY:



 Shayla C. White
 Book Manager



 Manager, Flight Procedures



 SODF Coordinator

ACCEPTED BY:



 Michael T. Hurt
 SODF Manager

File this PCN immediately behind the front cover as a permanent record



International Space Station Assembly Operations Book

ISS-20A

Mission Operations Directorate
Operations Division

29 JAN 10

*These procedures are available
electronically on the SODF Homepage
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National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



**INTERNATIONAL SPACE STATION
ASSEMBLY OPERATIONS
ISS-20A**

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1.113 N3 URINE JUMPER FILL

(ASSY OPS/20A/FIN)

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OBJECTIVE:

Fills Node 3 Pre-Treated Urine Line by connecting spare Urine Filter Hose and full EDB-Y to Pre-Treated Urine Line, which is at vacuum. This procedure should be executed within 4 hours, 24 minutes of the Pre-Treated Urine Line being evacuated.

LOCATION:

NOD3F4

DURATION:

20 minutes

CREW:

One

PARTS:

Urine Filter Hose P/N 10523.6728.00.020

EDB-Y P/N 11Φ615.8711-180A15-1

MATERIALS:

Regen ECLSS Tox-2 PPE Kit P/N SEG42103702-302:

Safety Goggles

Silver Shield Gloves

Dust Mask

1. PREPARING FLUID HOSES

WARNING

When mating or demating connections that contain pre-treated urine (Toxic level 2) or during urine transfer operations, silver shield gloves, dust mask, and goggles shall be worn to mitigate any exposure to a release of fluid.

NOTE

Have a Mess-Up Mitt ready for possible release of fluid when mating or demating any connections.

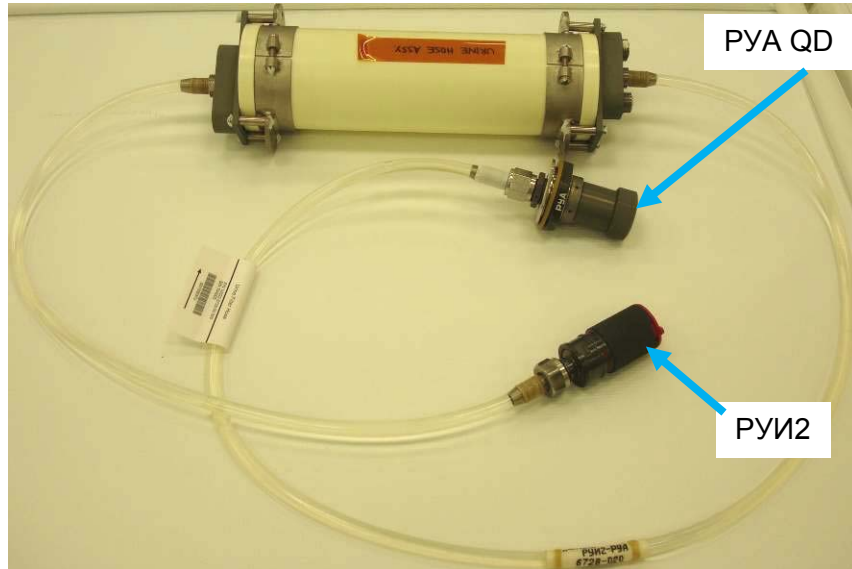


Figure 1.- Urine Filter Hose.

- 1.1 Don Silver Shield Gloves, Safety Goggles, Dust Mask.
- 1.2 Remove WHC Urine Filter Hose S/N 704003 from Ziplock Bags. Retrieve full ЕДВ-У per stowage notes.

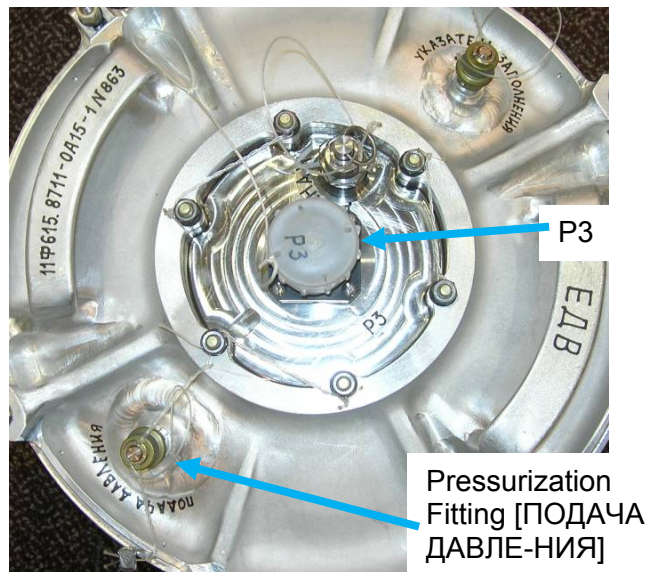
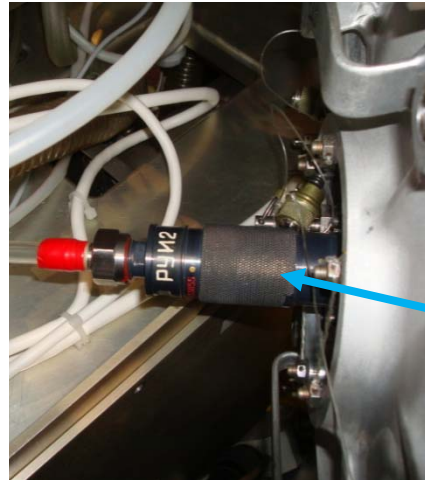


Figure 2.- ЕДВ-У Connections.

- 1.3 Tethered cap \leftrightarrow P3 of full ЕДВ-У
Tethered cap \leftrightarrow ПОДАЧА ДАВЛЕ-НИЯ of full ЕДВ-У
Cap \leftrightarrow РУИ2 of Urine Filter Hose
Temporarily stow cap.
Refer to Figures 1 and 2.



PYI2 Mated to P3
of EDB-Y

Figure 3.- Connection of Urine Filter Hose to EDB-Y.

1.4 Urine Filter Hose PYI2 →|← P3 of full EDB-Y
Refer to Figure 2.

2. FILLING NODE 3 PRE-TREATED URINE LINE

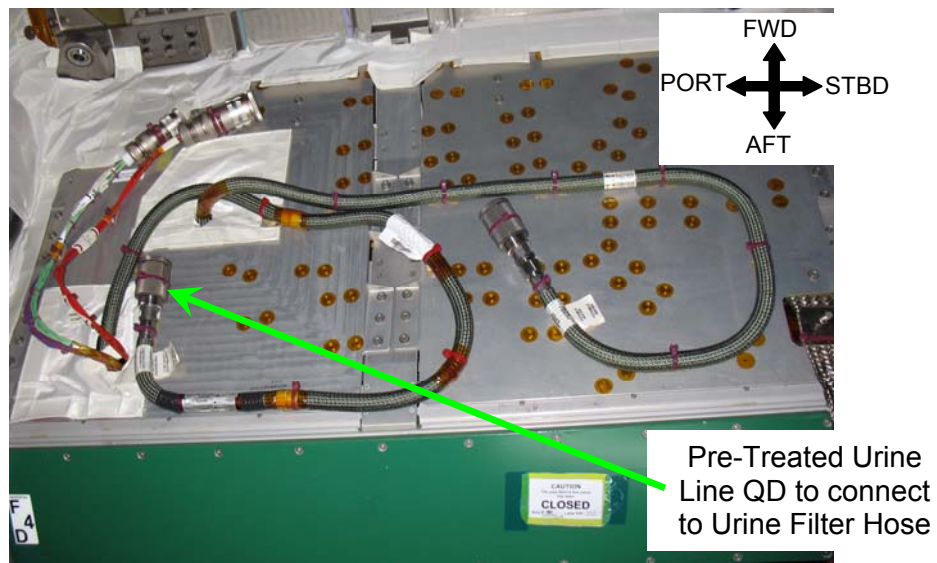


Figure 4.- WHC NOD3F4 Umbilical Launch Configuration.

NOD3F4

- 2.1 Locate Pre-Treated Urine Line in NOD3F4.
Remove Wire Ties as necessary for access (Wire Cutters).
- 2.2 Plug ←|→ QD Pre-Treated Urine Line
Cap ←|→ PYA QD of Urine Filter Hose
Temporarily stow cap and plug.
Refer to Figures 1 and 4.

1.113 N3 URINE JUMPER FILL

(ASSY OPS/20A/FIN)

Page 4 of 4 pages

NOTE

Preserved urine will transfer from the ЕДВ-У to the Pre-Treated Urine Line as soon as the РУА QD is connected. After 1 minute, fluid transfer should be complete.

- 2.3 Urine Filter Hose РУА QD →|← QD Pre-Treated Urine Line Monitor for leakage.

Visually verify fluid flow from ЕДВ-У through Urine Filter Hose to Node 3 Pre-Treated Urine Line.

- 2.4 Once fluid flow has stopped or after 1 minute of fluid transfer:
Urine Filter Hose РУА QD ←|→ QD Pre-Treated Urine Line
Plug →|← Pre-Treated Urine Line
Cap →|← РУА QD Urine Filter Hose

3. CLOSEOUT

- 3.1 Urine Filter Hose РУИ2 ←|→ P3 of ЕДВ-У
Cap →|← РУА QD of Urine Filter Hose
Refer to Figures 1 and 3.

ЕДВ-У

- 3.2 Tethered cap →|← P3 of ЕДВ-У
Tethered cap →|← ПОДАЧА ДАВЛЕ-НИЯ of ЕДВ-У
Refer to Figure 2.

- 3.3 Bag Urine Filter Hose (Ziplock Bag).

- 3.4 Doff Silver Shield Gloves, Safety Goggles, Dust Mask.

- 3.5 Stow items per stowage note.
Notify **MCC-H** of task completion.

1.127 CUPOLA CREW RESTRAINT INSTALLATION
(ASSY OPS/20A/FIN 1)

Page 1 of 6 pages

OBJECTIVE

Install the Cupola Crew Restraint.

LOCATION

Cupola

DURATION

20 Minutes

CREW:

One

PARTS:

Cupola Crew Restraint P/N 1700CU001-403 S/N 001
CCR Upper Restraint P/N 1710CU001-403 S/N 001
Platform Joint P/N 1723CU001-403 S/N 001
Lower Knee Post P/N 1724CU001-403 S/N 001
Upper Knee Post P/N 1722CU001-403 S/N 001

TOOLS

Digital Camera

1.127 CUPOLA CREW RESTRAINT INSTALLATION
(ASSY OPS/20A/FIN 1)

Page 2 of 6 pages

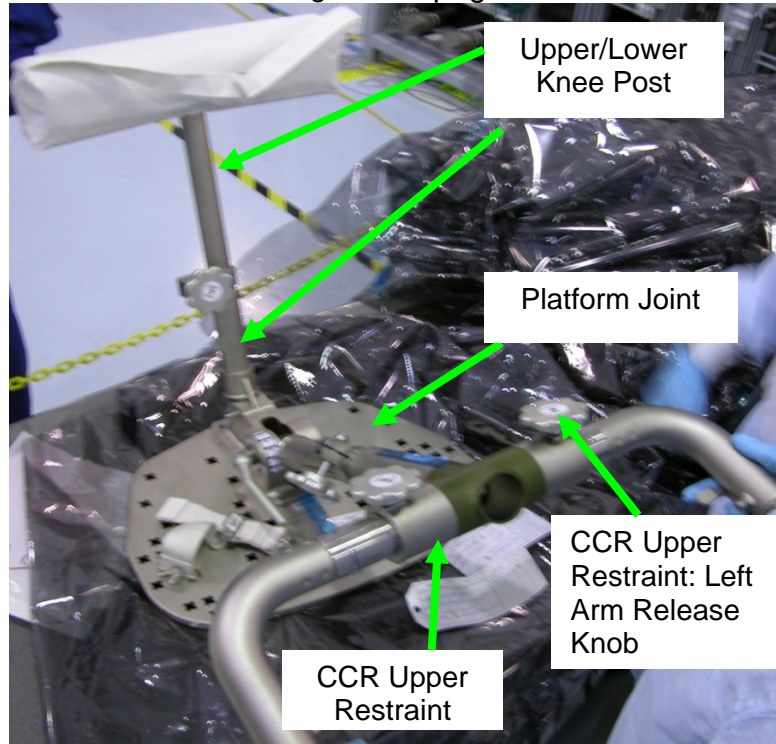


Figure 1. Cupola Crew Restraint Fully Assembled.

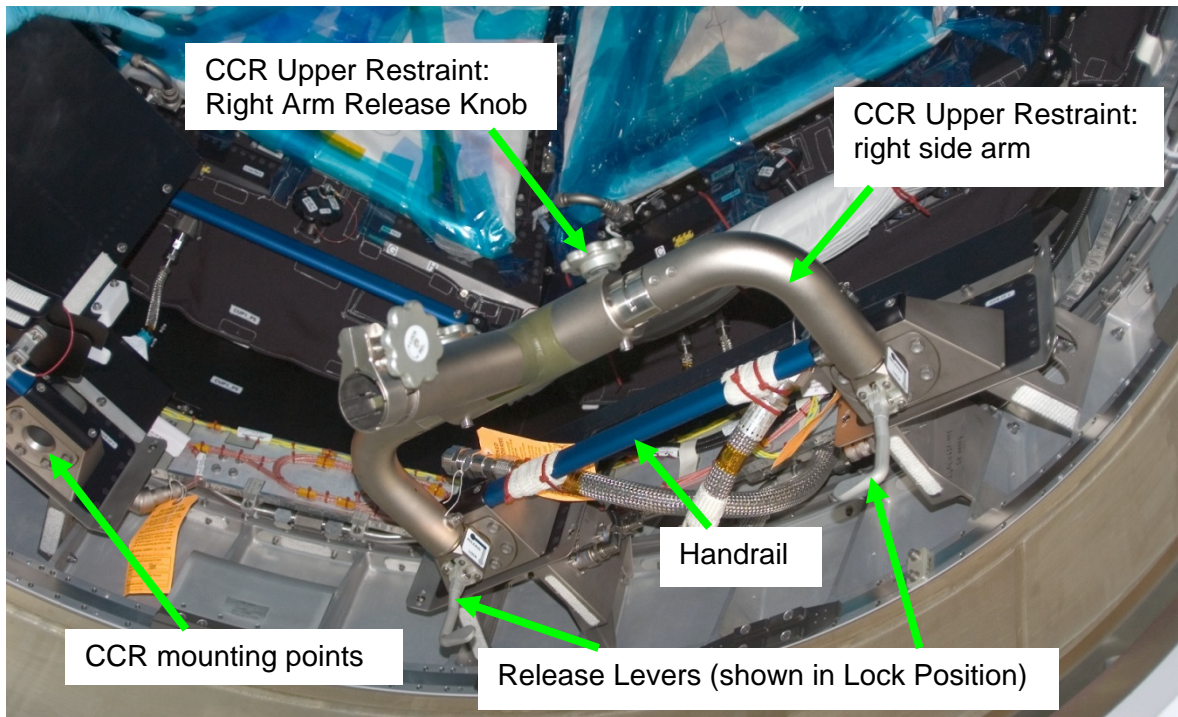


Figure 2. Mounting Location Directly in Front of Cupola Handrails
(Shown Installed at Window 4 Position).

1.127 CUPOLA CREW RESTRAINT INSTALLATION (ASSY OPS/20A/FIN 1)

Page 3 of 6 pages

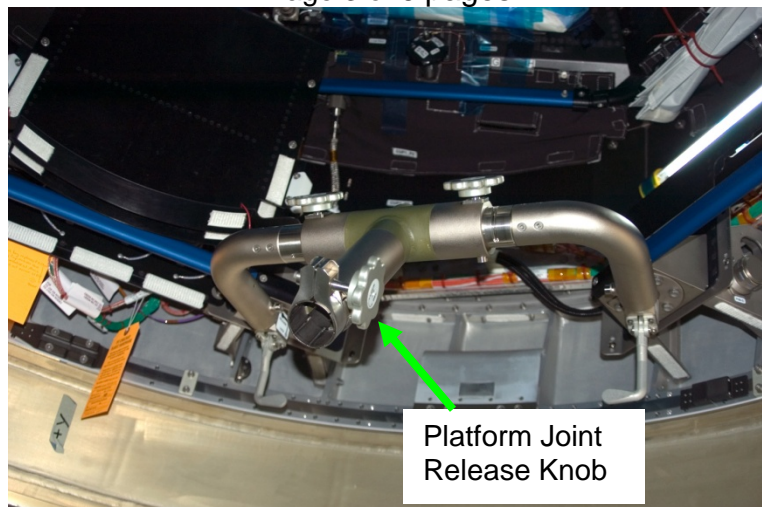


Figure 3. Mounting Location Between Cupola Handrails (Only CCR Upper Restraint Installed).



Figure 4. Upper Restraint: Right Arm Extended.

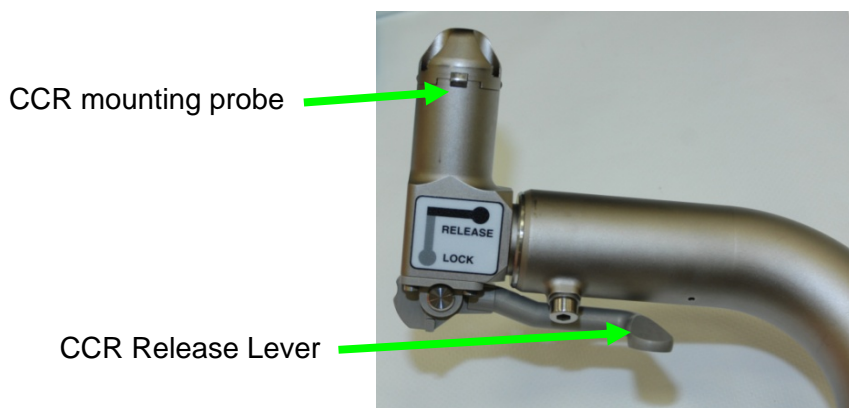


Figure 5. CCR Mounting Probe and Release Lever.

1.127 CUPOLA CREW RESTRAINT INSTALLATION

(ASSY OPS/20A/FIN 1)

Page 4 of 6 pages

NOTE

1. There are eight possible mounting positions for the Cupola Crew Restraint (CCR): directly in front of a Cupola Handrail (see Figure 2) or between a set of Handrails (see Figure 3).
2. Mounting between the handrails requires the right side arm of the CCR to slide out at the shoulder joint because the mounting points on Cupola are further apart.
3. Position of Cupola Crew Restraint is intended to be in front of RWS, but is up to crew discretion.
4. The reference for left and right is as you position your feet on the CCR.

1. INSTALLING CCR UPPER RESTRAINT IN CUPOLA

1.1 Adjusting Left Arm Length on CCR Upper Restraint

Loosen release knob on CCR Upper Restraint Left Arm by turning in REL. direction.

Slide out the Left Arm to hard stop.

Rotate Left Arm ~90 degrees, referring to Figure 2.

Tighten release knob by turning in LOCK direction.

Refer to Figures 1 and 2.

1.2 Adjusting Right Arm Length on CCR Upper Restraint

Loosen release knob on CCR Upper Restraint Right Arm by turning in REL. direction.

Rotate Right Arm ~90 degrees to match Left Arm.

Hold CCR Upper Restraint up to desired installation location to determine required width of Right Arm.

Insert the two Mounting Probes on the CCR Upper Restraint into

Cupola mounting locations, adjusting Right Arm width as required.

Once proper width is obtained, tighten release knob by turning in LOCK direction.

Refer to Figures 1 to 5.

1.3 Move CCR Release Levers (two) to Lock position to secure CCR Upper Restraint to Cupola Structure.

Refer to Figure 5.

1.127 CUPOLA CREW RESTRAINT INSTALLATION (ASSY OPS/20A/FIN 1)

Page 5 of 6 pages

Platform Joint Shaft
Slot (1 of 4)

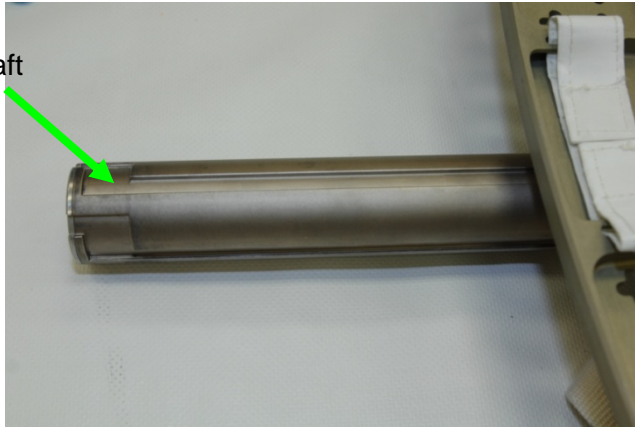


Figure 6. Platform Joint Shaft.

NOTE

There are four different mounting positions of the Platform Joint because of the four slots on the Platform Joint Shaft.

2. INSTALLING PLATFORM JOINT INTO UPPER RESTRAINT

- 2.1 Loosen Platform Joint Release Knob on CCR Upper Restraint by turning in REL. direction.
Refer to Figure 3.
- 2.2 Align the slots of the Platform Joint with the tab inside the end of the CCR Upper Restraint in desired orientation.
Refer to Figure 6.
- 2.3 Insert the Platform Joint Shaft approx. 1" into CCR Upper Restraint, then rotate 45 degrees and continue sliding shaft into Upper Restraint to desired length.
- 2.4 Tighten Platform Joint Release Knob by turning in LOCK direction.

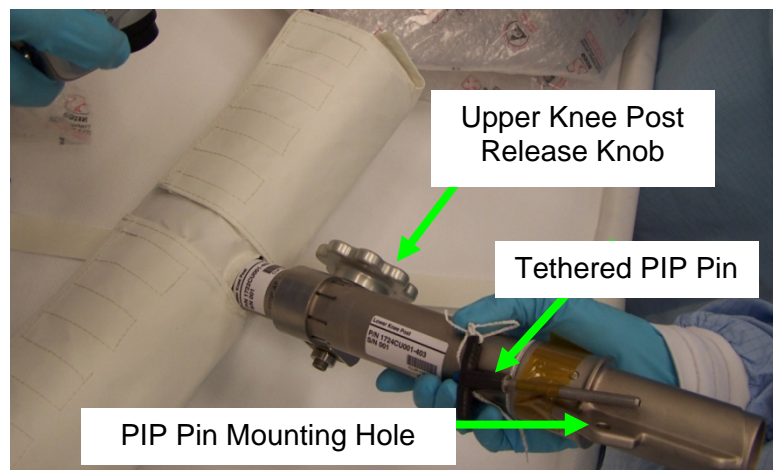


Figure 7. Upper and Lower Knee Post.

1.127 CUPOLA CREW RESTRAINT INSTALLATION (ASSY OPS/20A/FIN 1)

Page 6 of 6 pages

3. INSTALLING LOWER/UPPER KNEE POST

- 3.1 Insert the end of the Lower Knee Post into the Platform Joint and secure with tethered PIP pin.
Refer to Figure 7.
- 3.2 Loosen Upper Knee Post Release Knob by turning in REL. direction, and adjust Upper Knee Post as desired.
Tighten Upper Knee Post Release Knob by turning in LOCK direction.
- 3.3 Photo document completed installation of Cupola Crew Restraint, showing attachment points as well as overview.

CCR Upper Restraint:
Left side arm



Figure 8. Cupola Crew Restraint – Installed.

4. FINAL CONFIGURATION

Refer to Figure 8.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 1 of 45 pages

OBJECTIVE:

Setup the Fluid System Servicer (FSS). Purge Cupola ITCS lines to vacuum and then fill with ITCS coolant using the FSS. Reconfigure Cupola ITCS QDs so that Cupola is cooled by the Node 3 ITCS. Close the MTL Cupola MFCV. Purge the dry Node 3/Node 1 ITCS lines and then fill with ITCS coolant. Reconfigure Node 3 ITCS QDs to connect Node 3 to the Node 1 ITCS. Reconfigure Node 1 ITCS QDs so that Node 3 provides cooling to Node 1 and Airlock instead of the LAB ITCS. After FSS operations are complete, drain and purge the FSS and FSS jumpers.

LOCATION:

Node 3: Cupola ITCS Reconfiguration QDs at NOD3D6 (Starboard Endcone)

Node 3: Node 3 ITCS Reconfiguration QDs at NOD3D3 (Deck Midbay)

Node 1: Node 1 Mod Kit ITCS Jumper installed at NOD1P1 (Port Alcove)

DURATION:

Cupola FSS Fill

30 minutes for FSS Setup (steps 1 to 8)

75 minutes for Cupola Purge and Fill (steps 9 to 15)

30 minutes for Cupola ITCS QD Reconfiguration (steps 16 to 17)

10 minutes for MTL Cupola MFCV Manipulation (step 18)

5 minutes for FSS safing (step 19)

Node 3/1 FSS Fill

30 minutes for FSS preparation for Node 3/Node 1 ITCS Fill (steps 20 to 24)

60 minutes for Node 3/Node 1 ITCS Fill (steps 25 to 33)

25 minutes for Node 3 ITCS QD Reconfiguration (steps 34 to 36)

25 minutes for Node 1 ITCS QD Reconfiguration (steps 37 to 38)

10 minutes to for FSS safing (step 39)

FSS Cleanup

90 minutes for FSS Cleanup (steps 40 to 46)

PARTS:

Ziplock Bag labeled "1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS"

TCS MTL SUPPLY FROM NODE 3 Label (two)

TCS MTL RETURN TO NODE 3 Label (two)

MATERIALS:

Ziplock Bag, small (one)

Kapton Tape

Gray Tape

Aluminum Tape

Sharpie

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 2 of 45 pages

TOOLS:

Digital Camera

CSA-O2 (two) P/N SED46115801-305

PWR labeled "ITCS Water" P/N SEG46117689-301 S/N 1035

PWR labeled "ITCS Water" P/N SEG46117689-301 S/N 1034

PWR labeled "ITCS Water" P/N SEG46117689-301 S/N 1002

PS-120 Cable P/N SEG33114649-301

PEEK, 120 VDC 12 AMP 20" Extension Cable P/N SEG33112596-303

Restraint Mobility Aids (RMAs):

41.5" Hand Rail Assembly (two) P/N G11F5200-1

Adjustable Length Tether (one) P/N G11F5140-1

Fluid System Servicer (FSS):

Fluids Control Pump Assembly (FCPA) P/N 683-17117-1

Vacuum Access Jumpers:

VAJ-83-1 35 ft P/N 683-17111-2

FSS Jumpers:

5 ft FSS Jumpers

FSS-79-1 P/N 683-17111-9

FSS-79-2 P/N 683-17111-10

4 ft FSS Jumpers

FSS PWR Adapter P/N SEG46118440-301

3 ft FSS Jumpers

FSS-70-2 P/N 683-17111-20

FSS-64-2 Jumper P/N 683-17111-22

1.5 ft FSS Jumpers

FSS-68-1 Jumper P/N 683-17111-13

FSS-69-1 Jumper P/N 683-17111-15

FSS-77-2 P/N 683-17111-18

FSS-402-1 P/N 684-015090-0001 (new on 20A)

ISS IVA Toolbox:

Drawer 2:

Ratchet, 3/8" Drive

4" Ext, 3/8" Drive

5/32" Hex Head, 3/8" Drive

1/4" Hex Head Driver, 3/8" Drive (may be required in step 2.1)

Drawer 4:

Wire Cutters

REFERENCED PROCEDURE(S):

None

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 3 of 45 pages

1. PREPARING FSS WORKSITE

NOTE

Remove and replace protective caps, plugs from jumpers, electrical connectors as required throughout procedure.

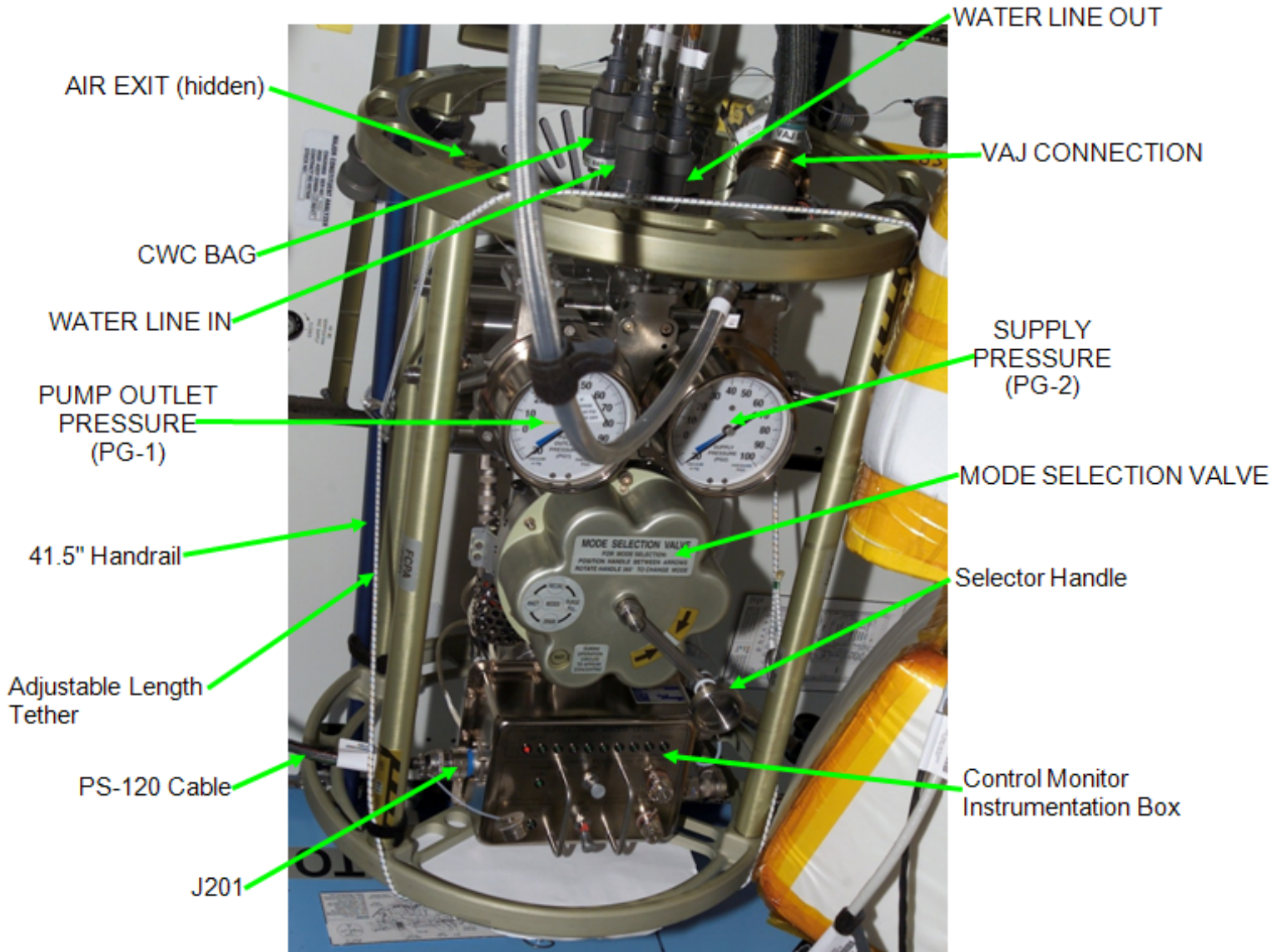


Figure 1.- Fluid Control Pump Assembly (FCPA).

- | | | |
|--------|-----|--|
| NOD3 | 1.1 | Install 41.5" Handrails (two) on seat tracks, in parallel, 6 to 8 inches apart, per crew preference.
Refer to Figure 1. |
| LAB106 | 1.2 | Remove FSS Beta Cloth Closeout covering top portion of LAB106 Rack, fold.
Temporarily stow. |

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 4 of 45 pages

2. SETTING UP FCPA

2.1 Unfasten triangular restraint bracket fasteners (six) securing FCPA by hand (if required, Ratchet, 3/8" Drive; 1/4" Hex Head, 3/8" Drive).

2.2 Remove FCPA.
Temporarily reinstall triangular restraint bracket.

2.3 Remove any FSS jumpers coiled in end of FCPA.
Temporarily stow jumpers.

NOD3 2.4 Place FCPA on pre-installed set of 41.5" Handrails (two), secure with Adjustable Length Tether (one).



Figure 2.- AIR EXIT and VAJ CONNECTION on FCPA.

2.5 Gamah Cap \leftarrow \rightarrow AIR EXIT on FCPA
Refer to Figures 1, 2.

2.6 Verifying FSS Power and Valve Positions

- √sw FSS MAIN POWER - OFF
- √MODE SELECTION VALVE - INACT
- √MV1 - BYPASS
- √MV2 - CLOSE
- √MV3 - DF1/SUPPLY

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 5 of 45 pages

3. CONFIGURING POWER

NOD3 UOP2 3.1 POWER OUT – RESET (illuminated)
(NOD3A6)

Verify FAULT/TEST – not illuminated

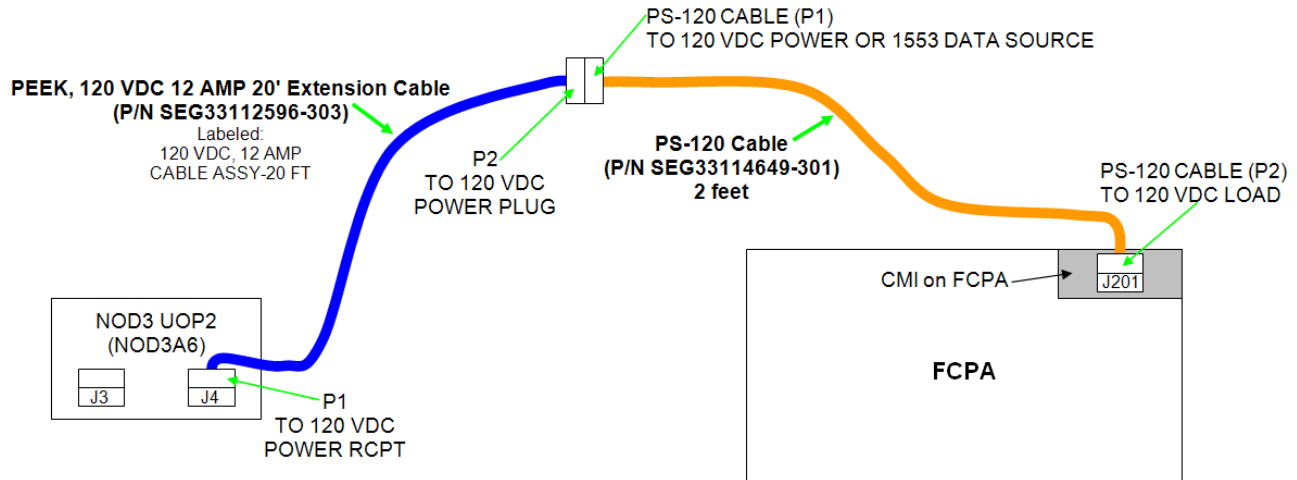


Figure 3.- FSS Power Configuration.

3.2 Configuring Power Cables Per Figure 3

PS-120 CABLE (P2) TO 120 VDC LOAD on PS-120 Cable →|← J201 on FCPA

P2 TO 120 VDC POWER PLUG on PEEK, 120 VDC 12 AMP 20' Extension Cable →|← PS-120 CABLE (P1) TO 120 VDC POWER OR 1553 DATA SOURCE on PS-120 Cable

P1 TO 120 VDC POWER RCPT on PEEK, 120 VDC 12 AMP 20' Extension Cable →|← J4 on NOD3 UOP2

Refer to Figure 3.

3.3 POWER OUT – (green ENABLE)

Verify FAULT/TEST – (green OK)

3.4 sw FSS MAIN POWER → ON

Verify POWER ON LED is illuminated.

3.5 sw PUMP TEST → ON for less than 3 seconds.

TEST ON LED will illuminate, pump noise should be heard.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 6 of 45 pages

4. CONNECTING TO VACUUM SOURCE

- PCS 4.1 Verifying Vent and Relief Isolation Valve (VRIV), Vent and Relief Control Valve (VRCV) Closed
Node 3: ECLSS: PCA

'Pressure Control Assembly'

sel VRCV (Icon)

Verify Position – Closed

Node 3: ECLSS: PCA

'Pressure Control Assembly'

sel VRIV (Icon)

Verify Position – Closed
- NOD3F0 4.2 Remove Closeout Panel NOD3F0-03, fasteners (thirteen) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 4.3 Remove Closeout Panel NOD3F0-02, fasteners (four) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 4.4 Gamah Cap ←|→ PCA Vacuum Access Port
Temporarily stow Gamah Cap.
- 4.5 Verify VAJ seals free from damage, debris on both ends of VAJ-83-1 35 ft.
- 4.6 VAJ-83-1 35 ft (bent end) →|← PCA Vacuum Access Port, hand tighten.
- FCPA 4.7 Gamah Cap ←|→ VAJ CONNECTION on FCPA
VAJ-83-1 35 ft (straight end) →|← VAJ CONNECTION on FCPA, hand tighten.
Restrain VAJ-83-1 35 ft per crew preference.
Refer to Figures 1 and 2.
- MCC-H 4.8 Suppressing Node 3 PPR Failure Caution
C&W Summ

'Event Code Tools'

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 7 of 45 pages

sel Suppress

Suppress Annunciation of an Event

input Event Code – 1 7 0 5 3 ('Positive P Relief Failure - Node 3')

cmd Arm
cmd Execute

NOTE

The following Caution message will be received after PPR is inhibited: '**Positive P Relief Failure - Node 3**'

No action required. This message will return to normal once PPR is re-enabled.

PCS

4.9 Disabling Positive Pressure Relief

Node 3: ECLSS: PCA: PCA Commands

Node 3 PCA Commands

'PCA'

Verify State – Monitor

'Positive Pressure Relief'

'Inhibit'

cmd Arm (Verify Status – Armed)

cmd Inhibit (Verify Positive Pressure Relief Status – Inhibited)

4.10 Opening Vacuum Relief Isolation Valve (VRIV)

Node 3: ECLSS: PCA

Node 3 ACS

'Pressure Control Assembly'

sel VRIV (Icon)

Node 3 PCA VRIV

'Open'

cmd Arm (Verify Status – Armed)

cmd Open (Verify Position – Open)

5. CONFIGURING FOR DRAIN OF FSS JUMPERS

NOTE

Refer to Figure 4 for step 5.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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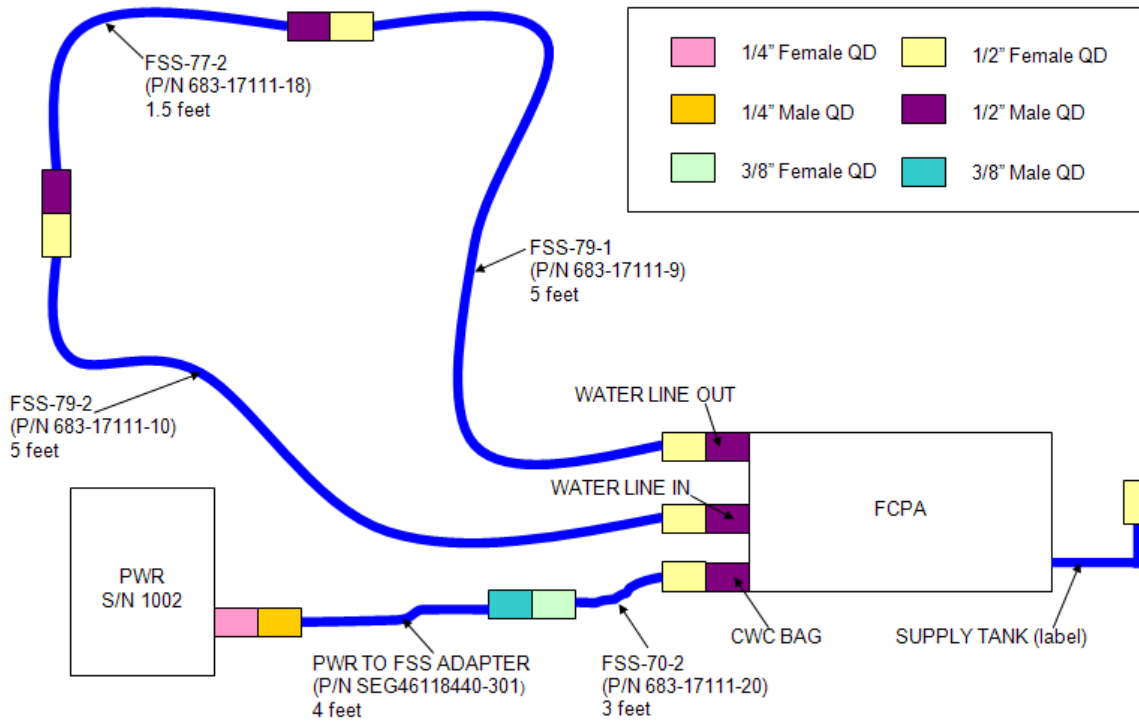


Figure 4.- FSS and Jumper Drain and Purge Setup.

- 5.1 FSS-79-1 →|← WATER LINE OUT on FCPA
 FSS-79-1 →|← FSS-77-2
 FSS-79-2 →|← FSS-77-2
 FSS-79-2 →|← WATER LINE IN on FCPA
- 5.2 FSS-70-2 →|← CWC BAG on FCPA
 PWR TO FSS ADAPTER →|← FSS-70-2
 PWR TO FSS ADAPTER →|← PWR S/N 1002

6. DRAINING FSS AND FSS JUMPERS

CAUTION

1. While in DRAIN, FILL, RECIRC mode (FSS Pump is on), PG1 (Pump Outlet Pressure) must be monitored to ensure FSS and ITCS lines do not become over pressurized.
2. PWR **S/N 1002** must be monitored to avoid overfilling during DRAIN operations. If PWR **S/N 1002** appears to approach the full point, MODE SELECTION VALVE should be rotated to INACT.

- 6.1 MV2 → OPEN
- 6.2 MODE SELECTION VALVE ↻ DRAIN (FCPA pump will turn ON)
- 6.3 Drain until PG-1 is in yellow range for 1 minute.

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* If PWR **S/N 1002** appears to be approaching full
* | MODE SELECTION VALVE ↻ INACT
* |
* | √**MCC-H** for further instructions
* |
* If PG1 pressure > 40 psig
* | sw FSS MAIN POWER → OFF
* |
* | √**MCC-H** for further instructions

6.4 MV2 → CLOSE
Drain for an additional 2 minutes.

7. PURGING FSS AND FSS JUMPERS

7.1 MODE SELECTION VALVE ↻ PURGE/FILL
(FCPA pump will turn OFF)

7.2 MV2 → OPEN

7.3 Purge until PG-1 is in blue arc for 30 seconds.
This action should take less than 10 minutes.

Record PG1 pressure: _____ in Hg

Record PG2 pressure: _____ in Hg

* If blue arc is not reached for 30 seconds within 10 minutes
* | MODE SELECTION VALVE ↻ INACT, then:
* |
* | MODE SELECTION VALVE ↻ DRAIN
* |
* | Drain until PG-1 is in yellow range for 30 seconds.
* |
* | If PWR S/N 1002 appears to be approaching full
* | | MODE SELECTION VALVE ↻ INACT
* | |
* | | √**MCC-H** for further instructions
* | |
* | MV2 → CLOSE
* |
* | Drain an additional 2 minutes.
* |
* | If PWR S/N 1002 appears to be approaching full
* | | MODE SELECTION VALVE ↻ INACT
* | |
* | | √**MCC-H** for further instructions
* | |
* | MODE SELECTION VALVE ↻ INACT
* |
* | Restart procedure from step 7.1.
* | Notify **MCC-H**.

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7.4 MV2 → CLOSE

7.5 MODE SELECTION VALVE ↻ INACT

8. DISCONNECTING FSS JUMPERS

8.1 Disconnecting FSS-77-2

FSS-77-2 ←|→ FSS-79-1

FSS-77-2 ←|→ FSS-79-2

8.2 If required, remove "WET" label from FSS-77-2.
Stow FSS-77-2.

8.3 Disconnecting PWR

FSS-70-2 ←|→ CWC BAG QD on FCPA

FSS-70-2 ←|→ PWR TO FSS ADAPTER

PWR TO FSS ADAPTER ←|→ PWR S/N 1002

9. REMOVING NODE 3 DECK MIDBAY CLOSEOUT PANELS

NOTE

Refer to Figure 5 for step 9.



Figure 5.- Node 3 Deck Midbay Closeout Panels (looking Starboard).

NOD3D2 9.1 Remove Closeout Panel NOD3D2-32, fasteners (four) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).

9.2 Remove Closeout Panel NOD3D2-33, fasteners (three) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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- 9.3 Remove Closeout Panel NOD3D2-34, fasteners (seventeen) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 9.4 Record CSA-O2 sampling in open cabin: _____ % (first CSA-O2).
Record CSA-O2 sampling in open cabin: _____ % (second CSA-O2).

Verify CSA-O2 sampling from both units are within 1.1 % of each other.
- 9.5 Perform CSA-O2 sampling in area where Closeout Panel was removed for 1 minute.
Verify O2 % within nominal range specified on CSA-O2 decal.

10. DEMATING CUPOLA HTL QDS FOR FSS FILL

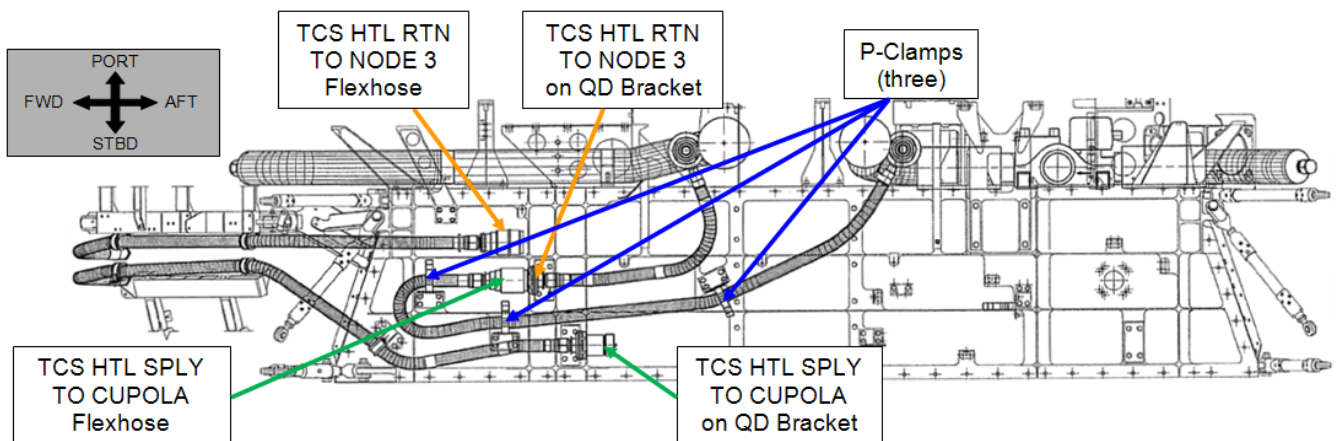


Figure 6.- Launch Configuration of Cupola HTL QDs (looking Overhead on Deck side of Deck Midbay).



Figure 7.- Cupola HTL QDs in Node 3 Deck Midbay (looking Starboard).

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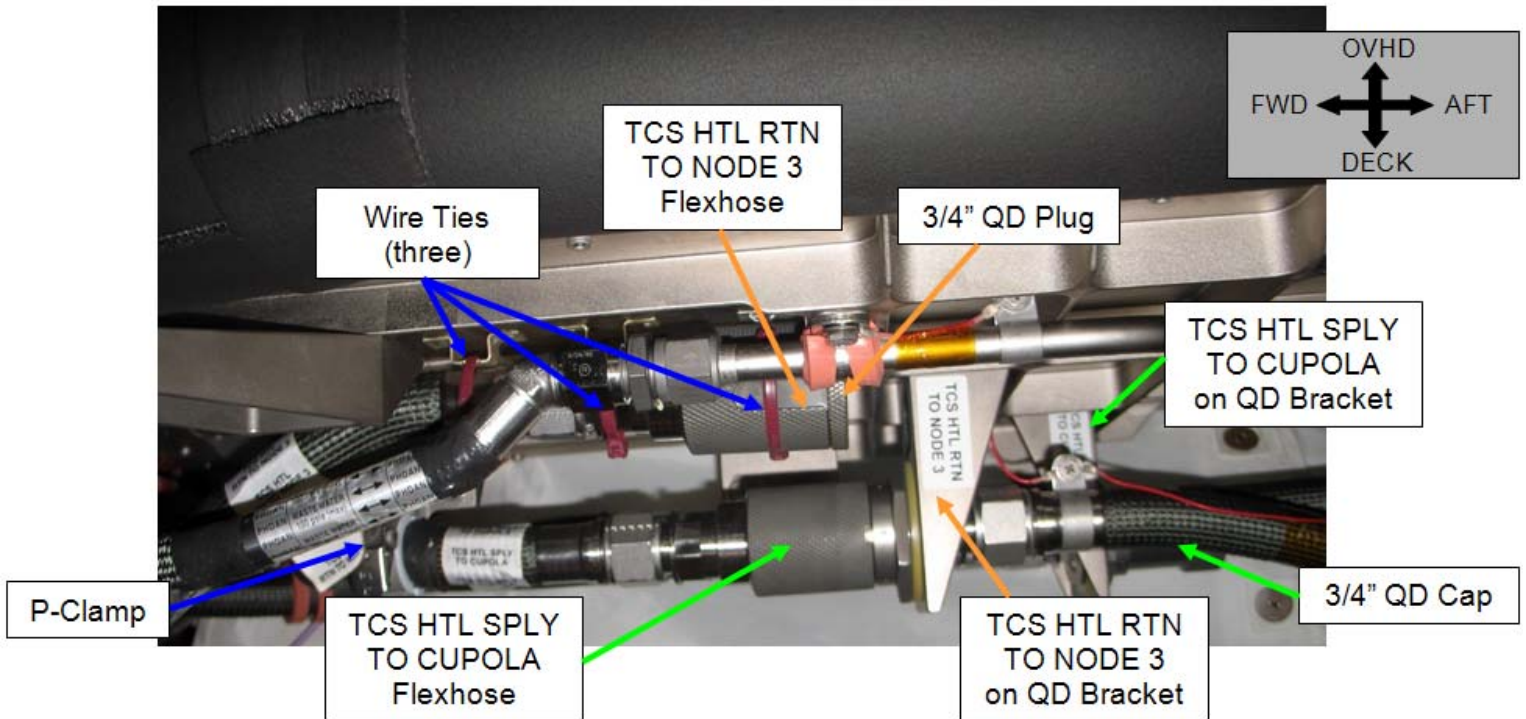


Figure 8.- Cupola HTL QDs (looking Starboard).

NOD3D3 10.1 Disengage P-Clamps (three) securing TCS HTL SPLY TO CUPOLA Flexhose to structure.
Refer to Figures 6, 7, and 8.

10.2 TCS HTL SPLY TO CUPOLA Flexhose \leftrightarrow TCS HTL RTN TO NODE 3 on QD Bracket
Refer to Figures 6, 7, and 8.

11. CONFIGURING FSS JUMPERS FOR CUPOLA FILL

NOTE

1. Refer to Figures 6, 7, 8, and 9 for step 11.
2. PWR S/N 1035 and associated jumpers shown in Figure 9 will not be connected until step 13.

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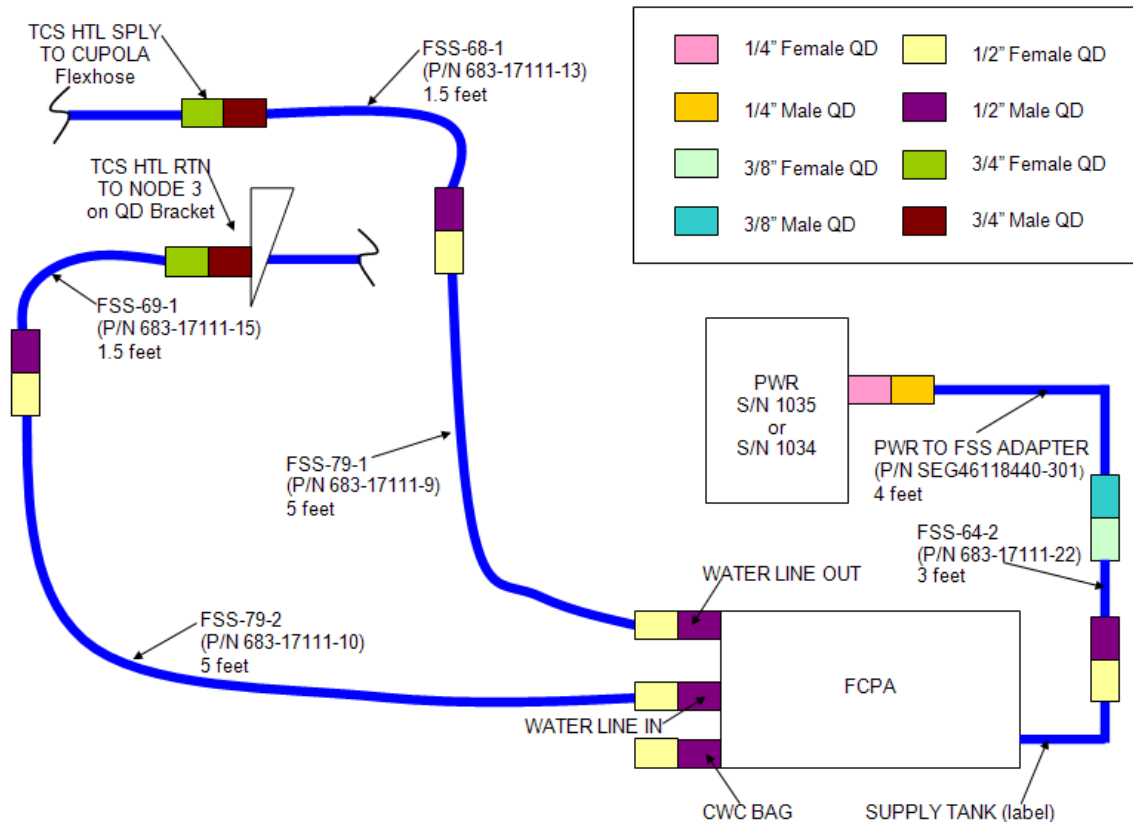


Figure 9.- FSS and Jumper Configuration for Cupola Fill.

- FCPA 11.1 √FSS-79-1 →|← WATER LINE OUT on FCPA
√FSS-79-2 →|← WATER LINE IN on FCPA
- NOD3D3 11.2 FSS-68-1 →|← FSS-79-1
FSS-68-1 →|← TCS HTL SPLY TO CUPOLA Flexhose
- 11.3 FSS-69-1 →|← FSS-79-2
FSS-69-1 →|← TCS HTL RTN TO NODE 3 on QD Bracket

12. PURGING CUPOLA

- FCPA 12.1 MODE SELECTION VALVE ↻ PURGE/FILL
- 12.2 MV2 → OPEN
- 12.3 Purge until PG-1 is in blue arc for 30 seconds.
This action should take less than 10 minutes.

Record PG1 pressure: _____ in Hg
Record PG2 pressure: _____ in Hg

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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```
*****
* If blue arc is not reached for 30 seconds within 10 minutes
* | MODE SELECTION VALVE ↻ INACT, then:
* |
* | MODE SELECTION VALVE ↻ DRAIN
* |
* | Drain until PG-1 is in yellow range for 30 seconds.
* |
* | MV2 → CLOSE
* |
* | Drain an additional 2 minutes.
* |
* | MODE SELECTION VALVE ↻ INACT
* |
* | Restart procedure from step 12.1.
* | Notify MCC-H.
*****
```

12.4 MV2 → CLOSE

12.5 MODE SELECTION VALVE ↻ INACT

13. CONNECTING PAYLOAD WATER RESERVOIR (PWR)

13.1 FSS-64-2 →|← SUPPLY TANK on FCPA
FSS-64-2 →|← PWR TO FSS ADAPTER

13.2 PWR TO FSS ADAPTER →|← PWR S/N 1035
Refer to Figure 9.

14. FILLING AND RECIRCULATING CUPOLA

CAUTION

While in DRAIN, FILL, RECIRC mode (FSS Pump is on), PG1 (Pump Outlet Pressure) must be monitored to ensure FSS and ITCS lines do not become over pressurized.

14.1 MODE SELECTION VALVE ↻ PURGE/FILL

14.2 MV2 → OPEN

14.3 MV1 → FILL (FCPA pump will turn ON)

```
*****
* If PG1 pressure > 40 psig
* | sw FSS MAIN POWER → OFF
* |
* | √MCC-H for further instructions
*****
```

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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```
*****
* If PWR S/N 1035 appears empty
* | MV1 → BYPASS (FCPA pump will turn OFF)
* |
* | MODE SELECTION VALVE ↶ to INACT
* |
* | Notify MCC-H.
* |
* | PWR TO FSS ADAPTER ←|→ PWR S/N 1035
* | PWR TO FSS ADAPTER →|← PWR S/N 1034
* |
* | MODE SELECTION VALVE ↶ PURGE/FILL
* |
* | MV1 → FILL (FCPA pump will turn ON)
*****
```

Wait 15 minutes.

Record PG1 pressure: _____ psig
Record PG2 pressure: _____ psig

14.4 MV1 → BYPASS (FCPA pump will turn OFF)

14.5 MODE SELECTION VALVE ↶ RECIRC (FCPA pump will turn ON)

```
*****
* If PG1 pressure > 40 psig
* | sw FSS MAIN POWER → OFF
* |
* | √MCC-H for further instructions
*****
```

Recirculate for 5 minutes.

Record PG1 pressure: _____ psig
Record PG2 pressure: _____ psig

14.6 MODE SELECTION VALVE ↶ INACT (FCPA pump will turn OFF)

14.7 MV2 → CLOSE

14.8 Notify **MCC-H** of coolant quantity remaining in PWR S/N 1035, 1034.

15. DISCONNECTING FSS FROM CUPOLA HTL QDS

NOD3D3

15.1 FSS-68-1 ←|→ TCS HTL SPLY TO CUPOLA Flexhose
3/4" QD Cap →|← FSS-68-1

15.2 FSS-69-1 ←|→ TCS HTL RTN TO NODE 3 on QD Bracket
3/4" QD Plug →|← FSS-69-1

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16. RECONFIGURING CUPOLA HTL QDS

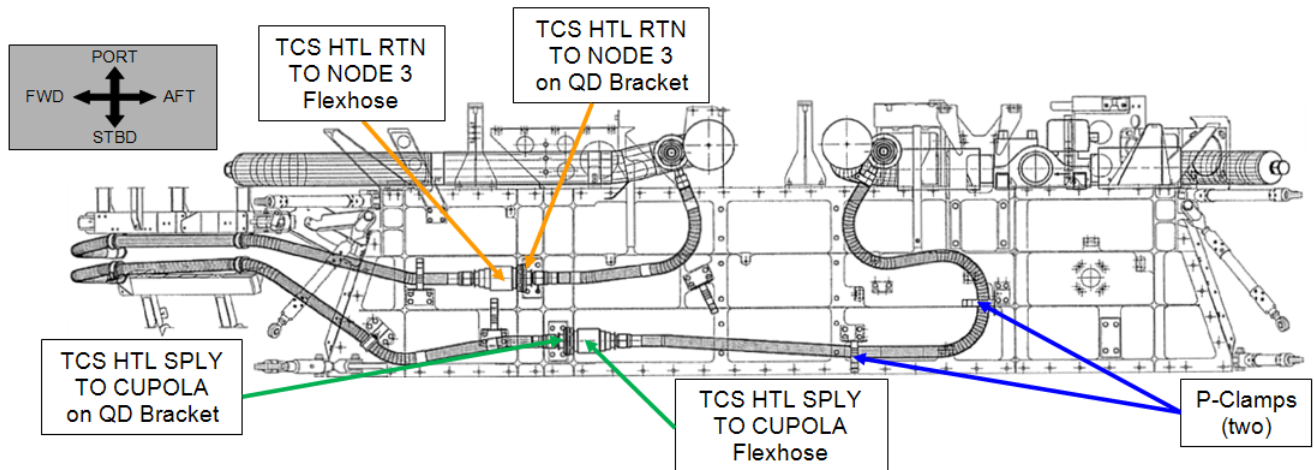


Figure 10.- On-Orbit Configuraiton of Cupola HTL QDs
(looking Overhead on Deck side of Deck Midbay).

- 16.1 3/4" QD Cap \leftarrow | \rightarrow TCS HTL SPLY TO CUPOLA on QD Bracket
TCS HTL SPLY TO CUPOLA Flexhose \rightarrow | \leftarrow TCS HTL SPLY TO CUPOLA on QD Bracket
Refer to Figures 6, 7, 8, 10.
- 16.2 Route TCS HTL SPLY TO CUPOLA Flexhose in on-orbit configuration.
Engage P-Clamps (two).
Refer to Figure 10.
- 16.3 Cut Wire Ties (three) securing TCS HTL RTN TO NODE 3 Flexhose to structure (Wire Cutters).
Refer to Figure 8.
- 16.4 3/4" QD Plug \leftarrow | \rightarrow TCS HTL RTN TO NODE 3 Flexhose
TCS HTL RTN TO NODE 3 Flexhose \rightarrow | \leftarrow TCS HTL RTN TO NODE 3 on QD Bracket
Refer to Figures 8 and 10.
- 16.5 Temporarily stow 3/4" QD Cap (from step 16.1) for later installation on FSS-402-1 (new on 20A).
Stow 3/4" QD Plug (from step 16.4).

17. INSTALLING NODE 3 DECK MIDBAY CLOSEOUT PANELS

NOTE
Refer to Figure 5 for step 17.

- NOD3D2 17.1 Install Closeout Panel NOD3D2-32, fasteners (four) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).

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- 17.2 Install Closeout Panel NOD3D2-33, fasteners (three) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 17.3 Install Closeout Panel NOD3D2-34, fasteners (seventeen) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).

18. CLOSING CUPOLA MTL MFCV

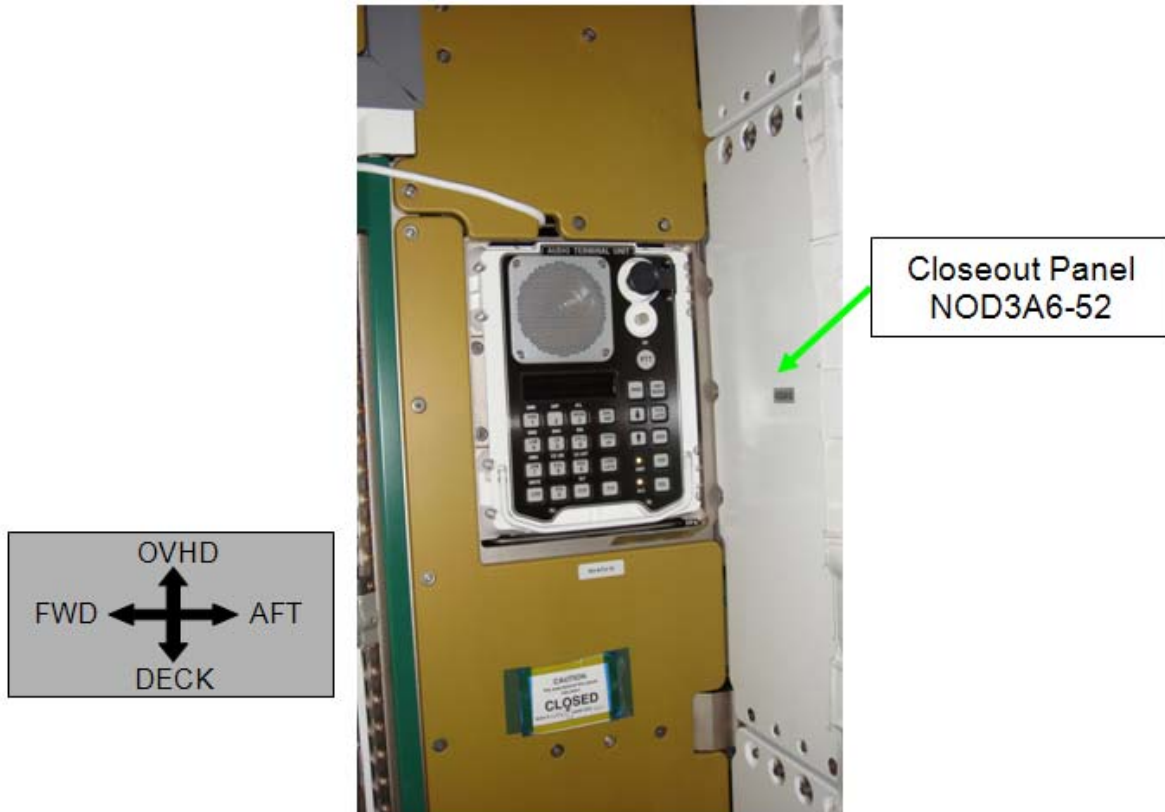


Figure 11.- Aft Portion of Node 3 Starboard Endcone (looking Starboard).

- NOD3A6
- 18.1 Remove Closeout Panel NOD3A6-52, fasteners (four) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive). Refer to Figure 11.

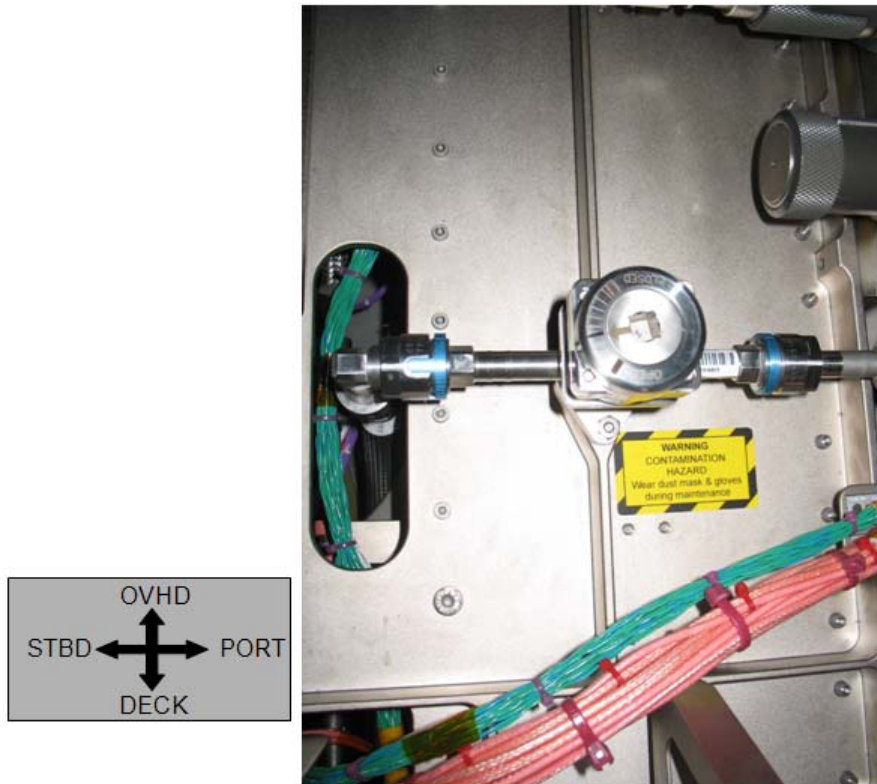


Figure 12.- N3-HTL/MTL-CUP/N1-MFCV (looking Aft).

CAUTION

When rotating the Manual Flow Control Valve (MFCV), rotate no faster than one tick mark every 15 seconds. If the MFCV is moved too quickly, ITCS FDIR software will automatically reduce the speed to the LTL and MTL pumps. Reduction in the pump speed protects the System Flow Control Assembly (SFCA) delta pressure sensor from damage.

18.2 Rotate N3-HTL/MTL-CUP/N1-MFCV ↻ Closed by incrementing one tick mark every 15 seconds (Ratchet, 3/8" Drive; 4" Ext, 3/8" Drive).

Refer to Figure 12.

18.3 Install Closeout Panel NOD3A6-52, fasteners (four) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).

19. SAFING FSS (IF REQUIRED)

19.1 sw FSS MAIN POWER → OFF

19.2 Verifying FSS Power and Valve Positions

- √MODE SELECTION VALVE - INACT
- √MV1 - BYPASS
- √MV2 - CLOSE
- √MV3 - DF1/SUPPLY

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19.3 Gamah Cap →|← AIR EXIT on FCPA, hand tighten
Refer to Figures 1 and 2.

PCS

19.4 Closing VRIV
Node 3: ECLSS: PCA
Node 3 ACS
'Pressure Control Assembly'

sel VRIV (Icon)

Node 3 PCA VRIV
'Close'

cmd Close (Verify Position – Closed)

19.5 Enabling Positive Pressure Relief (PPR)
Node 3: ECLSS: PCA: PCA Commands
Node 3 PCA Commands
'Positive Press Relief'
'Enable'

cmd Enable (Verify Positive Pressure Relief State – Enabled)

MCC-H

19.6 Enabling Node 3 PPR Failure Caution
C&W Summ
Caution & Warning Summary
'Event Code Tools'

sel Enable

Enable an Event

input Event Code – 1 7 0 5 3 ('Positive P Relief Failure - Node 3')

cmd Execute

19.7 ISS ↓ **MCC-H**, "FSS safing complete."

20. RECONFIGURING FOR FSS OPS (IF REQUIRED)

FCPA

20.1 Verifying FSS Power and Valve Positions

√sw FSS MAIN POWER	- OFF
√MODE SELECTION VALVE	- INACT
√MV1	- BYPASS
√MV2	- CLOSE
√MV3	- DF1/SUPPLY

20.2 Gamah Cap ←|→ AIR EXIT on FCPA
Refer to Figures 1 and 2.

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MCC-H

20.3 Suppressing Node 3 PPR Failure Caution C&W Summ

Caution & Warning Summary

'Event Code Tools'

sel Suppress

Suppress Annunciation of an Event

input Event Code – 1 7 0 5 3 ('**Positive P Relief Failure - Node 3**')

cmd Arm

cmd Execute

NOTE

The following Caution message will be received after PPR is inhibited: '**Positive P Relief Failure - Node 3**'

No action required. This message will return to normal once PPR is re-enabled.

PCS

20.4 Disabling Positive Pressure Relief Node 3: ECLSS: PCA: PCA Commands

Node 3 PCA Commands

'PCA'

Verify State – Monitor

'Positive Pressure Relief'

'Inhibit'

cmd Arm (Verify Status – Armed)

cmd Inhibit (Verify Positive Pressure Relief Status – Inhibited)

20.5 Opening Vacuum Relief Isolation Valve (VRIV)

Node 3: ECLSS: PCA

Node 3 ACS

'Pressure Control Assembly'

sel VRIV (Icon)

Node 3 PCA VRIV

'Open'

cmd Arm (Verify Status – Armed)

cmd Open (Verify Position – Open)

20.6 sw FSS MAIN POWER → ON

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21. CONFIGURING PWR FOR DRAINING FSS AND FSS JUMPERS

NOTE
Refer to Figure 13 for step 21.

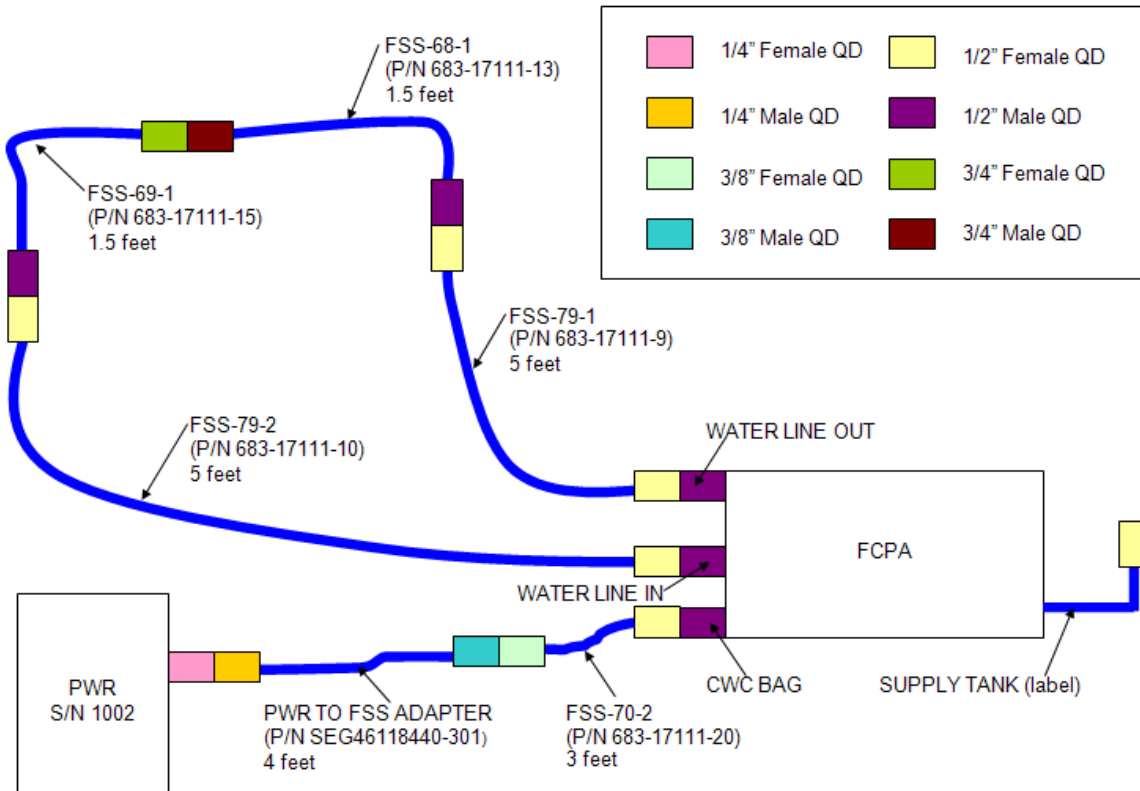


Figure 13.- FSS and FSS Jumper Drain and Purge Configuration.

- FCPA
- 21.1 FSS-68-1 →|← FSS-69-1
 - 21.2 FSS-64-2 ←|→ SUPPLY TANK on FCPA
FSS-64-2 ←|→ PWR TO FSS ADAPTER
PWR S/N 1034 ←|→ PWR TO FSS ADAPTER
 - 21.3 FSS-70-2 →|← CWC BAG on FCPA
PWR TO FSS ADAPTER →|← FSS-70-2
PWR TO FSS ADAPTER →|← PWR S/N 1002
 - 21.4 √FSS jumpers configured per Figure 13

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22. DRAINING FSS AND FSS JUMPERS

CAUTION
1. While in DRAIN, FILL, RECIRC mode (FSS Pump is on), PG1 (Pump Outlet Pressure) must be monitored to ensure FSS and ITCS lines do not become over pressurized.
2. PWR S/N 1002 must be monitored to avoid overfilling during DRAIN operations. If PWR S/N 1002 appears to approach the full point, MODE SELECTION VALVE should be rotated to INACT.

22.1 MV2 → OPEN

22.2 MODE SELECTION VALVE ↻ DRAIN (FCPA pump will turn ON)

22.3 Drain until PG-1 is in yellow range for 1 minute.

```
*****
* If PWR S/N 1002 appears to be approaching full
* | MODE SELECTION VALVE ↻ INACT
* |
* | √MCC-H for further instructions
* |
* If PG1 pressure > 40 psig
* | sw FSS MAIN POWER → OFF
* |
* | √MCC-H for further instructions
*****
```

22.4 MV2 → CLOSE

Drain for an additional 2 minutes.

23. PURGING FSS AND FSS JUMPERS

23.1 MODE SELECTION VALVE ↻ PURGE/FILL
(FCPA pump will turn OFF)

23.2 MV2 → OPEN

23.3 Purge until PG-1 is in blue arc for 30 seconds.
This action should take less than 10 minutes.

Record PG1 pressure: _____ in Hg

Record PG2 pressure: _____ in Hg

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 23 of 45 pages

```
*****
* If blue arc is not reached for 30 seconds within 10 minutes
* | MODE SELECTION VALVE ↻ INACT, then:
* |
* | MODE SELECTION VALVE ↻ DRAIN
* |
* | Drain until PG-1 is in yellow range for 30 seconds.
* |
* | If PWR S/N 1002 appears to be approaching full
* | | MODE SELECTION VALVE ↻ INACT
* | |
* | | √MCC-H for further instructions
* |
* | MV2 → CLOSE
* |
* | Drain an additional 2 minutes.
* |
* | If PWR S/N 1002 appears to be approaching full
* | | MODE SELECTION VALVE ↻ INACT
* | |
* | | √MCC-H for further instructions
* |
* | MODE SELECTION VALVE ↻ INACT
* |
* | Restart procedure from step 23.1.
* | Notify MCC-H.
*****
```

23.4 MV2 → CLOSE

23.5 MODE SELECTION VALVE ↻ INACT

24. DISCONNECTING FSS JUMPERS

24.1 Disconnecting PWR

FSS-70-2 ←|→ CWC BAG QD on FCPA

FSS-70-2 ←|→ PWR TO FSS ADAPTER

PWR TO FSS ADAPTER ←|→ PWR S/N 1002

25. REMOVING NODE 1 PORT ALCOVE CLOSEOUT PANEL

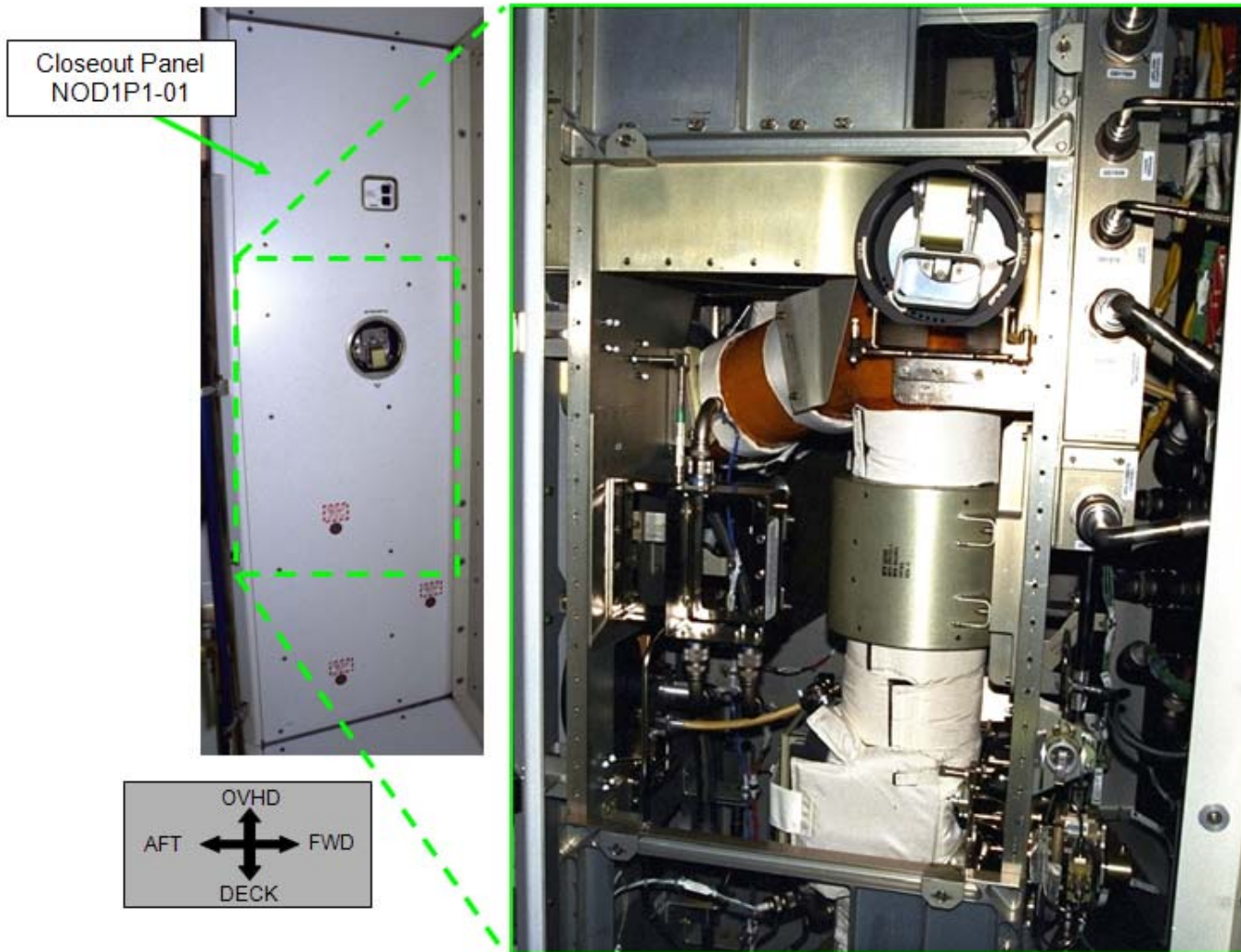


Figure 14.- Node 1 Port Alcove.

- NOD1P1
- 25.1 Remove Closeout Panel NOD1P1-01, fasteners (twelve) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive). Refer to Figure 14.
 - 25.2 Record CSA-O2 sampling in open cabin: _____ % (first CSA-O2).
Record CSA-O2 sampling in open cabin: _____ % (second CSA-O2).

Verify CSA-O2 sampling from both units are within 1.1 % of each other.
 - 25.3 Perform CSA-O2 sampling in area where Closeout Panel was removed for 1 minute.
Verify O2 % within nominal range specified on CSA-O2 decal.

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26. CONFIGURING NODE 1 JUMPERS FOR NODE 3/NODE 1 FILL

NOTE

1. Refer to Figures 14 and 15 for step 26.
2. FSS-402-1 is a new adapter flying on 20A.

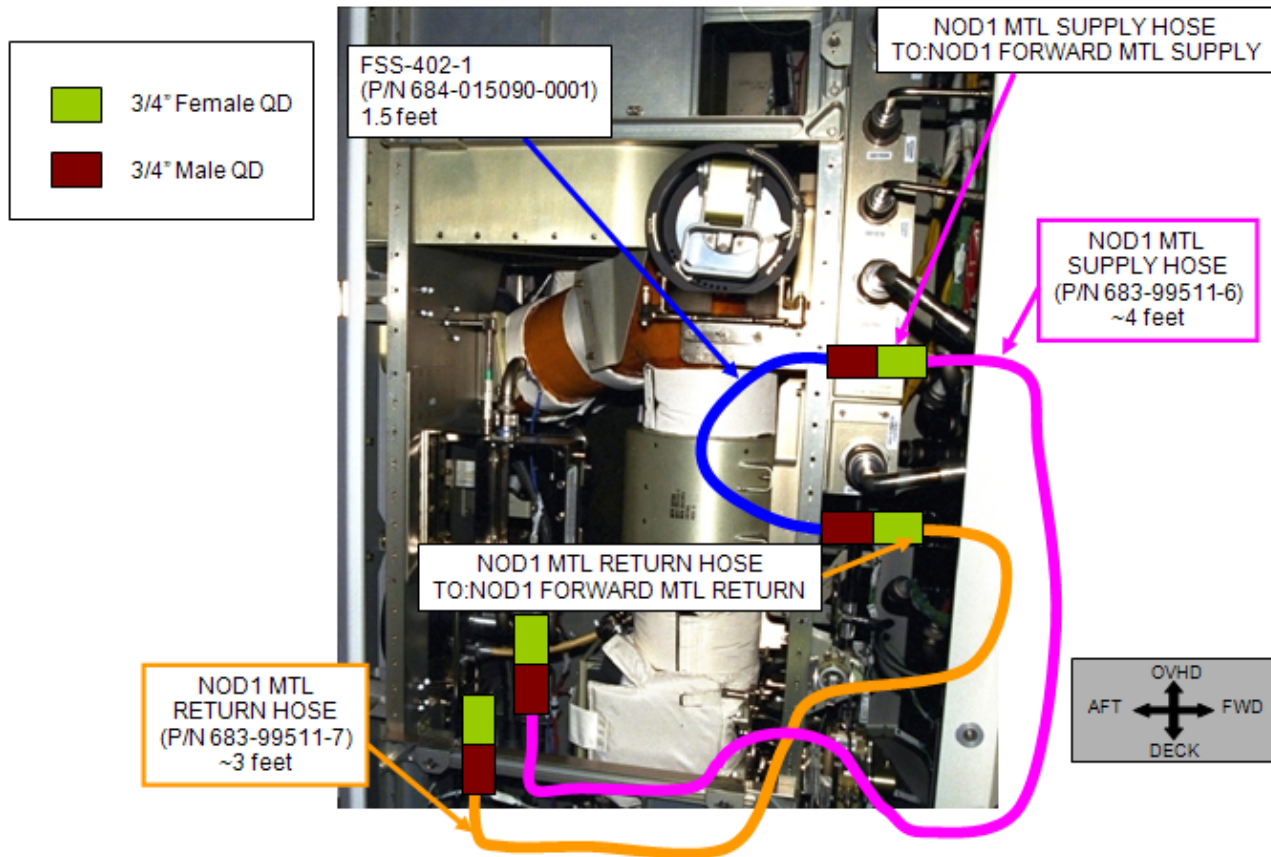


Figure 15.- Node 1 Mod Kit MTL Jumper Configuration in Node 1 Port Alcove (looking Port).

- NOD1P1
- 26.1 3/4" QD Plug $\leftarrow\rightarrow$ TO: NOD1 FORWARD MTL RETURN on NOD1 MTL RETURN HOSE
FSS-402-1 $\rightarrow\leftarrow$ TO: NOD1 FORWARD MTL RETURN on NOD1 MTL RETURN HOSE
 - 26.2 3/4" QD Plug $\leftarrow\rightarrow$ TO: NOD1 FORWARD MTL SUPPLY on NOD1 MTL SUPPLY HOSE
FSS-402-1 $\rightarrow\leftarrow$ TO: NOD1 FORWARD MTL SUPPLY on NOD1 MTL SUPPLY HOSE
 - 26.3 Temporarily stow 3/4" QD Plugs (two).

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27. REMOVING NODE 3 STARBOARD ENDCONE CLOSEOUT PANELS



Figure 16.- Node 3 Starboard Endcone Deck Closeout Panels (looking Starboard).

- NOD3D6 27.1 Remove NOD3D6-52 Closeout Panel, fasteners (two) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive). Refer to Figure 16.

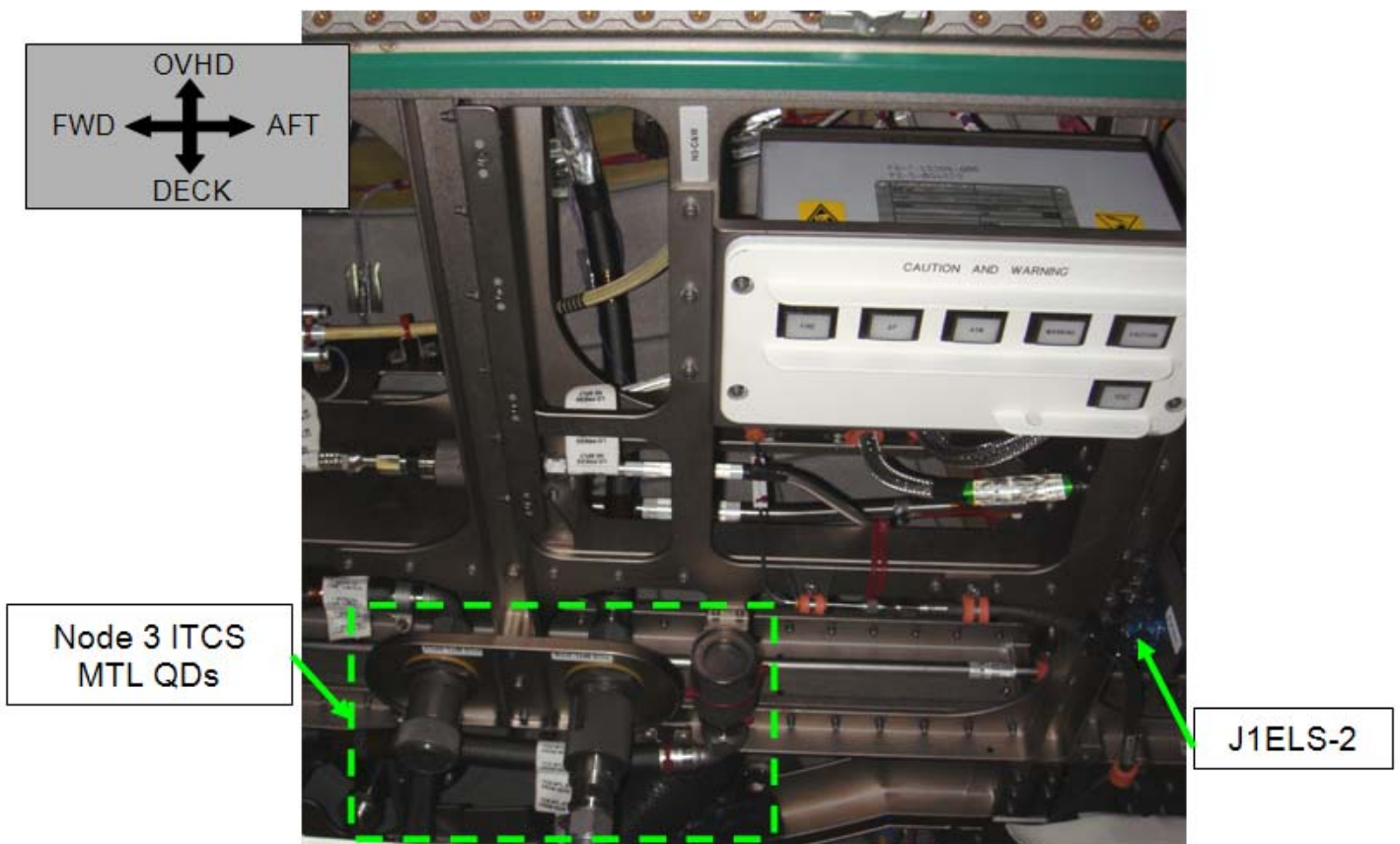


Figure 17.- Node 3 Deck Starboard Endcone (looking Deck Starboard).

- 27.2 EELS Power Cable \leftarrow \rightarrow J1ELS-2
Refer to Figure 17.

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- 27.3 Remove NOD3D6-51 Closeout Panel, fasteners (ten) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive). Refer to Figure 16.
- 27.4 Record CSA-O2 sampling in open cabin: _____ % (first CSA-O2).
Record CSA-O2 sampling in open cabin: _____ % (second CSA-O2).

Verify CSA-O2 sampling from both units are within 1.1 % of each other.

- 27.5 Perform CSA-O2 sampling in area where Closeout Panel was removed for 1 minute.
Verify O2 % within nominal range specified on CSA-O2 decal.

28. CONNECTING FSS TO NODE 3 ITCS MTL QDS

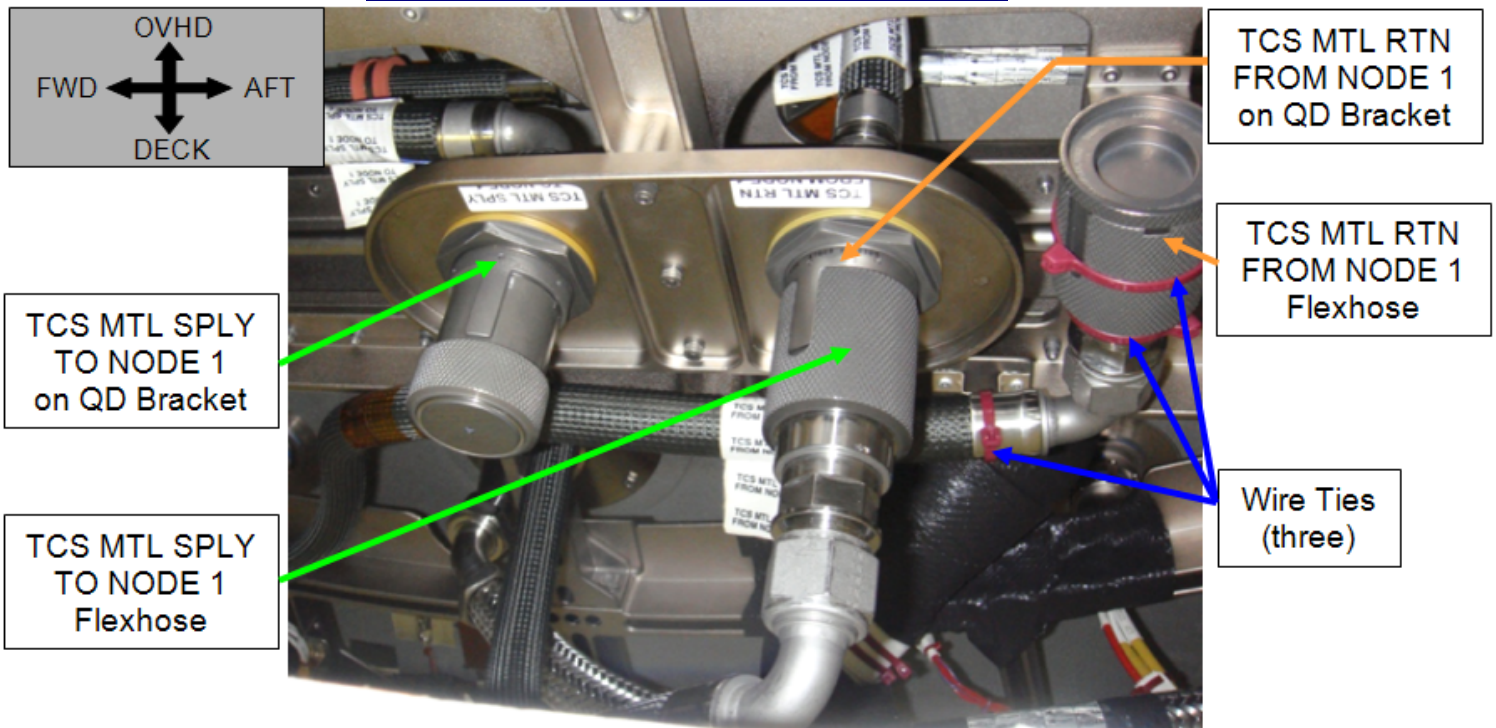


Figure 18.- Node 3 ITCS MTL QDs (looking Deck Starboard).

- 28.1 TCS MTL SPLY TO NODE 1 Flexhose ←|→ TCS MTL RTN FROM NODE 1 on QD Bracket
Refer to Figures 17 and 18.

NOTE

1. Refer to Figures 17, 18, and 19 for step 28.
2. PWR S/N 1034 and associated jumpers shown in Figure 19 will not be connected until step 30.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

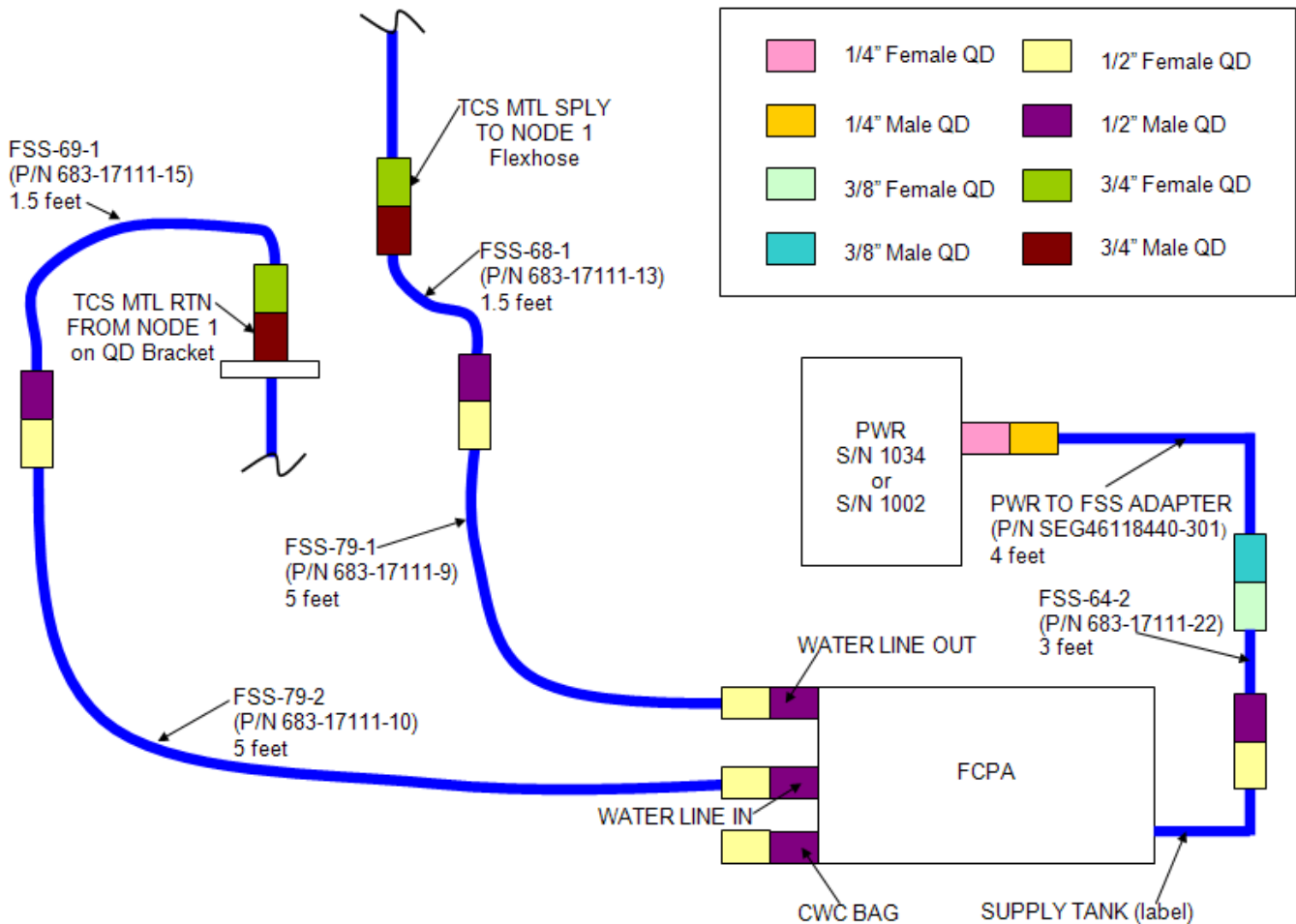


Figure 19.- FSS and Jumper Configuration for Node 3-Node 1 ITCS Fill.

28.2 Disconnecting FSS Jumpers

FSS-68-1 ←|→ FSS-69-1

28.3 √FSS-79-1 →|← WATER LINE OUT

√FSS-79-1 →|← FSS-68-1

28.4 √FSS-79-2 →|← WATER LINE IN

√FSS-79-2 →|← FSS-69-1

28.5 FSS-68-1 →|← TCS MTL SPLY TO NODE 1 Flexhose

FSS-69-1 →|← TCS MTL RTN FROM NODE 1 on QD Bracket

29. PURGING NODE 3/NODE 1 ITCS MTL LINES

FCPA

29.1 MODE SELECTION VALVE ↻ PURGE/FILL

29.2 MV2 → OPEN

29.3 Purge until PG-1 is in blue arc for 30 seconds.
This action should take less than 15 minutes.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 29 of 45 pages

Record PG1 pressure: _____ in Hg

Record PG2 pressure: _____ in Hg

* If blue arc is not reached for 30 seconds within 15 minutes
* MODE SELECTION VALVE ↶ INACT, then:
*
* MODE SELECTION VALVE ↶ DRAIN
*
* Drain until PG-1 is in yellow range for 30 seconds.
*
* MV2 → CLOSE
*
* Drain an additional 2 minutes.
*
* MODE SELECTION VALVE ↶ INACT
*
* Restart procedure from step 29.1.
* Notify **MCC-H**.

29.4 MV2 → CLOSE

29.5 MODE SELECTION VALVE ↶ INACT

30. CONNECTING PAYLOAD WATER RESERVOIR (PWR)

30.1 FSS-64-2 →|← SUPPLY TANK on FCPA
FSS-64-2 →|← PWR TO FSS ADAPTER

30.2 PWR TO FSS ADAPTER →|← PWR S/N 1034
Refer to Figure 19.

31. FILLING AND RECIRCULATING NODE 3/NODE 1 ITCS MTL LINES

CAUTION

While in DRAIN, FILL, RECIRC mode (FSS Pump is on), PG1 (Pump Outlet Pressure) must be monitored to ensure FSS and ITCS lines do not become over pressurized.

31.1 MODE SELECTION VALVE ↶ PURGE/FILL

31.2 MV2 → OPEN

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 30 of 45 pages

31.3 MV1 → FILL (FCPA pump will turn ON)

```
*****
* If PG1 pressure > 40 psig
* | sw FSS MAIN POWER → OFF
* |
* | √MCC-H for further instructions
*****

*****
* If PWR S/N 1034 appears empty
* | MV1 → BYPASS (FCPA pump will turn OFF)
* |
* | MODE SELECTION VALVE ↶ to INACT
* |
* | Notify MCC-H.
* |
* | PWR TO FSS ADAPTER ←|→ PWR S/N 1034
* | PWR TO FSS ADAPTER →|← PWR S/N 1002
* |
* | MODE SELECTION VALVE ↶ PURGE/FILL
* |
* | MV1 → FILL (FCPA pump will turn ON)
*****
```

Wait 10 minutes.

Record PG1 pressure: _____ psig
Record PG2 pressure: _____ psig

31.4 MV1 → BYPASS (FCPA pump will turn OFF)

31.5 MODE SELECTION VALVE ↶ RECIRC (FCPA pump will turn ON)

```
*****
* If PG1 pressure > 40 psig
* | sw FSS MAIN POWER → OFF
* |
* | √MCC-H for further instructions
*****
```

Recirculate for 5 minutes.

Record PG1 pressure: _____ psig
Record PG2 pressure: _____ psig

31.6 MODE SELECTION VALVE ↶ INACT (FCPA pump will turn OFF)

31.7 MV2 → CLOSE

31.8 Notify MCC-H of quantity of coolant remaining in PWR S/N 1034, 1002.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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32. DISCONNECTING FSS FROM NODE 3 ITCS MTL QDS

- 32.1 FSS-68-1 →|← TCS MTL SPLY TO NODE 1 Flexhose
FSS-69-1 →|← TCS MTL RTN FROM NODE 1 on QD Bracket

33. DISCONNECTING FSS-402-1 FROM NODE 1 MOD KIT TCS JUMPERS

- NOD1P1 33.1 FSS-402-1 ←|→ TO: NOD1 FORWARD MTL RETURN on NOD1 MTL RETURN HOSE
3/4" QD Plug (from step 26.3) →|← TO: NOD1 FORWARD MTL RETURN on NOD1 MTL RETURN HOSE

- 33.2 FSS-402-1 ←|→ TO: NOD1 FORWARD MTL SUPPLY on NOD1 MTL SUPPLY HOSE
3/4" QD Plug (from step 26.3) →|← TO: NOD1 FORWARD MTL SUPPLY on NOD1 MTL SUPPLY HOSE

- 33.3 3/4" QD Cap (from step 16.5) →|← FSS-402-1

34. RECONFIGURING NODE 3 ITCS MTL QDS

- NOD3D6 34.1 √ **MCC-H** to verify Node 3 MTL Stbd RFCA closed

34.2 **On MCC-H GO**

- 3/4" QD Cap ←|→ TCS MTL SPLY TO NODE 1 on QD Bracket
TCS MTL SPLY TO CUPOLA Flexhose →|← TCS MTL SPLY TO CUPOLA on QD Bracket
Refer to Figures 17 and 18.

- 34.3 Cut Wire Ties (three) securing TCS MTL RTN FROM NODE 1 Flexhose to structure (Wire Cutters).
Refer to Figure 18.

- 34.4 3/4" QD Plug ←|→ TCS MTL RTN FROM NODE 1 Flexhose
TCS MTL RTN FROM NODE 1 Flexhose →|← TCS MTL RTN FROM NODE 1 on QD Bracket
Refer to Figures 17 and 18.

- 34.5 3/4" QD Cap (from step 34.2) →|← FSS-402-1
Stow 3/4" QD Plug (from step 34.4).

- 34.6 ISS ↓ **MCC-H**, "Node 3 ITCS QD reconfiguration complete."

35. INSTALLING NODE 3 STARBOARD ENDCONE CLOSEOUT PANELS

- NOD3D6 35.1 Install NOD3D6-51 Closeout Panel, fasteners (ten) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
Refer to Figure 16.

- 35.2 EELS Power Cable →|← J1ELS-2
Refer to Figure 17.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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35.3 Install NOD3D6-52 Closeout Panel, fasteners (two) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
Refer to Figure 16.

36. RELABELING QD1T11 AND QD1T12 IN NODE 1 PORT ALCOVE

NOTE

During ULF-3, NOD1 MTL RETURN HOSE was mated to QD1T11 and NOD1 MTL SUPPLY HOSE was mated to QD1T12. Neither hose is installed in Figure 20.

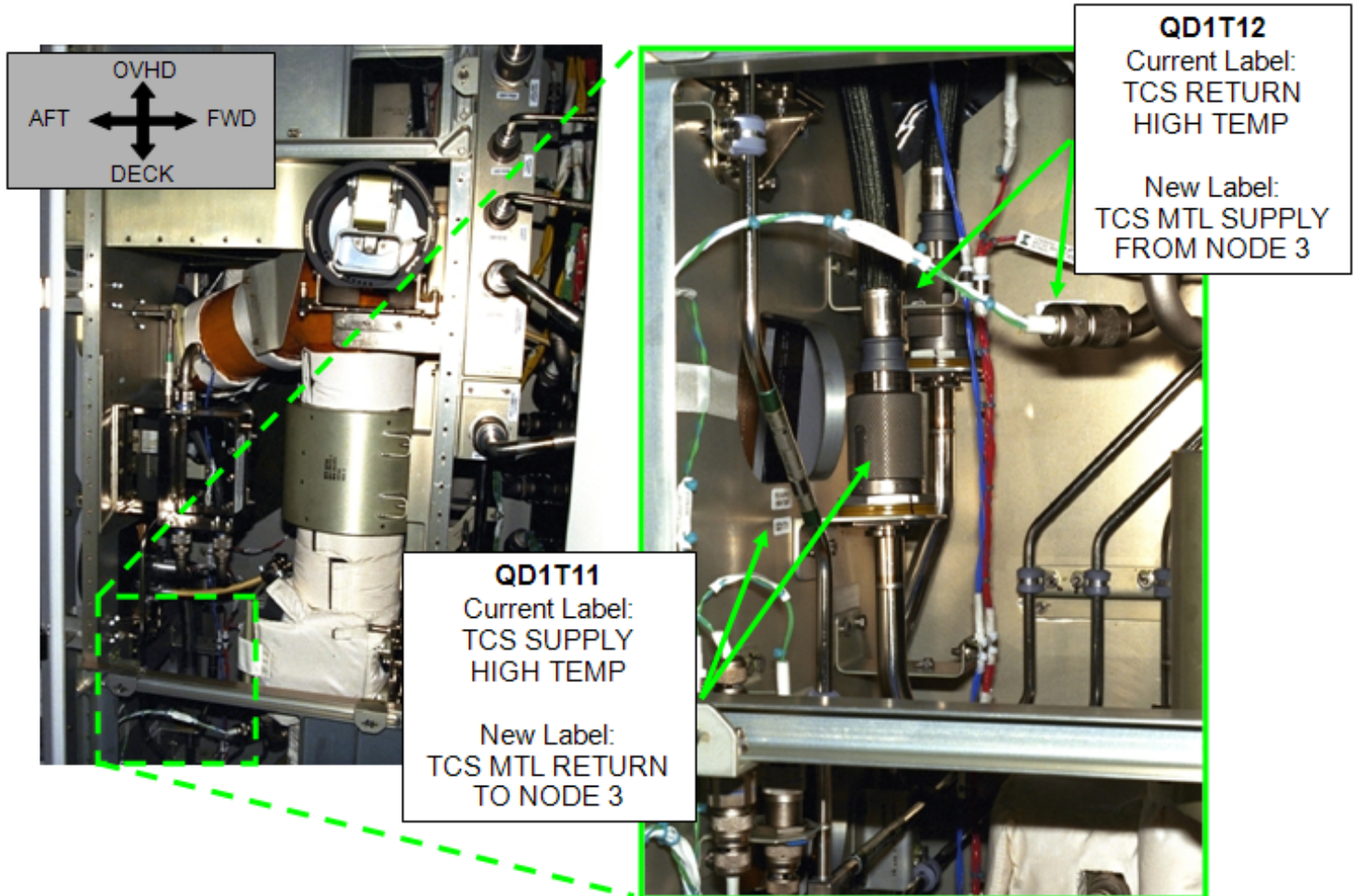


Figure 20.- QD1T11 and QD1T12 in Node 1 Port Alcove.

NOTE

New labels were flown with 20A Vestibule Outfitting hardware. If MTL Supply and MTL Return labels are not found, new labels can be fabricated using the Label Maker.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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NOD1P1 36.1 Cover current TCS labels (Aluminum Tape).
Install new TCS MTL SUPPLY FROM NODE 3 (one), TCS MTL
RETURN TO NODE 3 (one) labels.
Refer to Figure 20.

36.2 Photo document newly installed labels (Digital Camera).

37. RECONFIGURING NODE 1/AIRLOCK FROM LAB TO NODE 3

NOTE

Cooling will be lost to the hardware in the Node 1 and Airlock when Node 1 MTL Rack Flow Control Assembly (RFCA) closed in step 37.2. Cooling is restored after the completion of step 37.7.

37.1 ISS ↓ **MCC-H**, "Ready to close Node 1 MTL RFCA."

CAUTION

Both Flexhoses must be demated from QD1T03 and QD1T04 prior to mating NOD1 MTL SUPPLY HOSE and NOD1 MTL RETURN HOSE to prevent cross-strapping Node 3 and LAB.

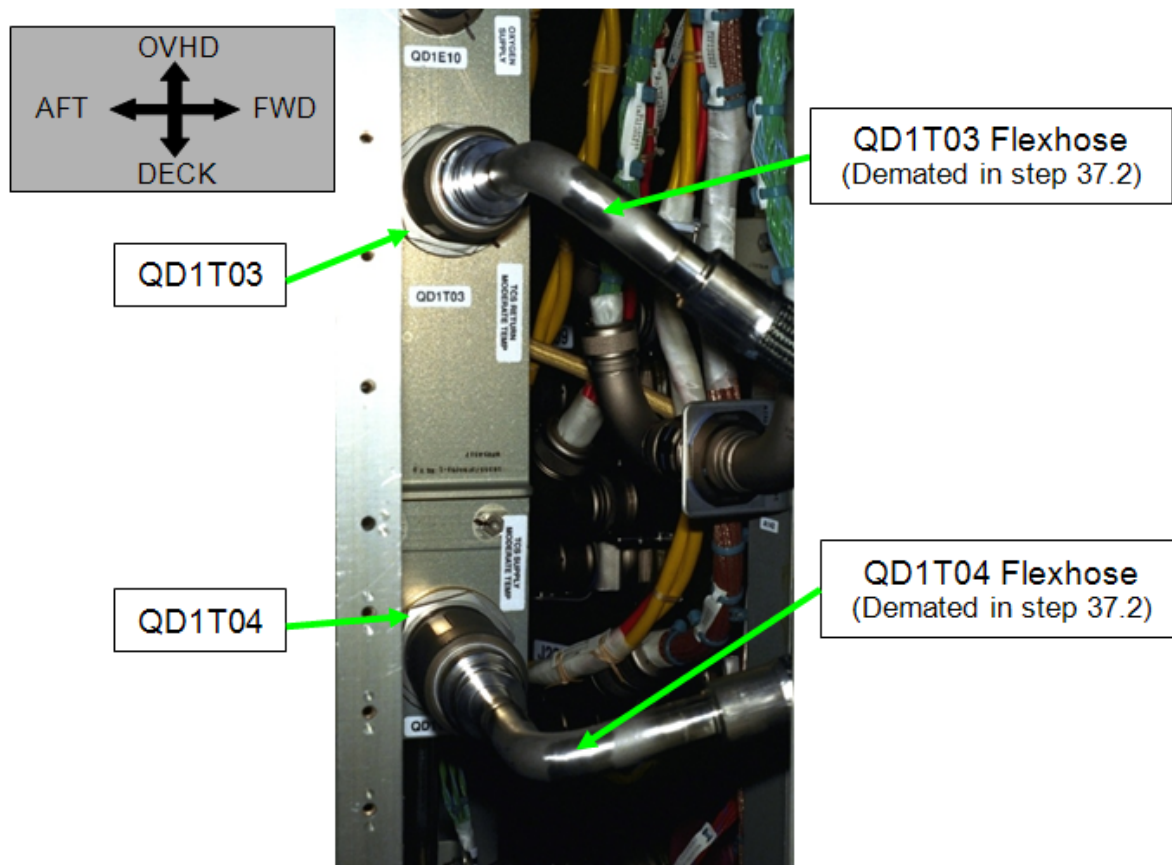


Figure 21.- Node 1 Port Alcove ITCS QD Panel.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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NOD1P1 37.2 Demating QD Flexhoses from ITCS QD Panel

On MCC-H GO,

QD1T03 Flexhose ←|→ QD1T03

QD1T04 Flexhose ←|→ QD1T04

Refer to Figure 21.

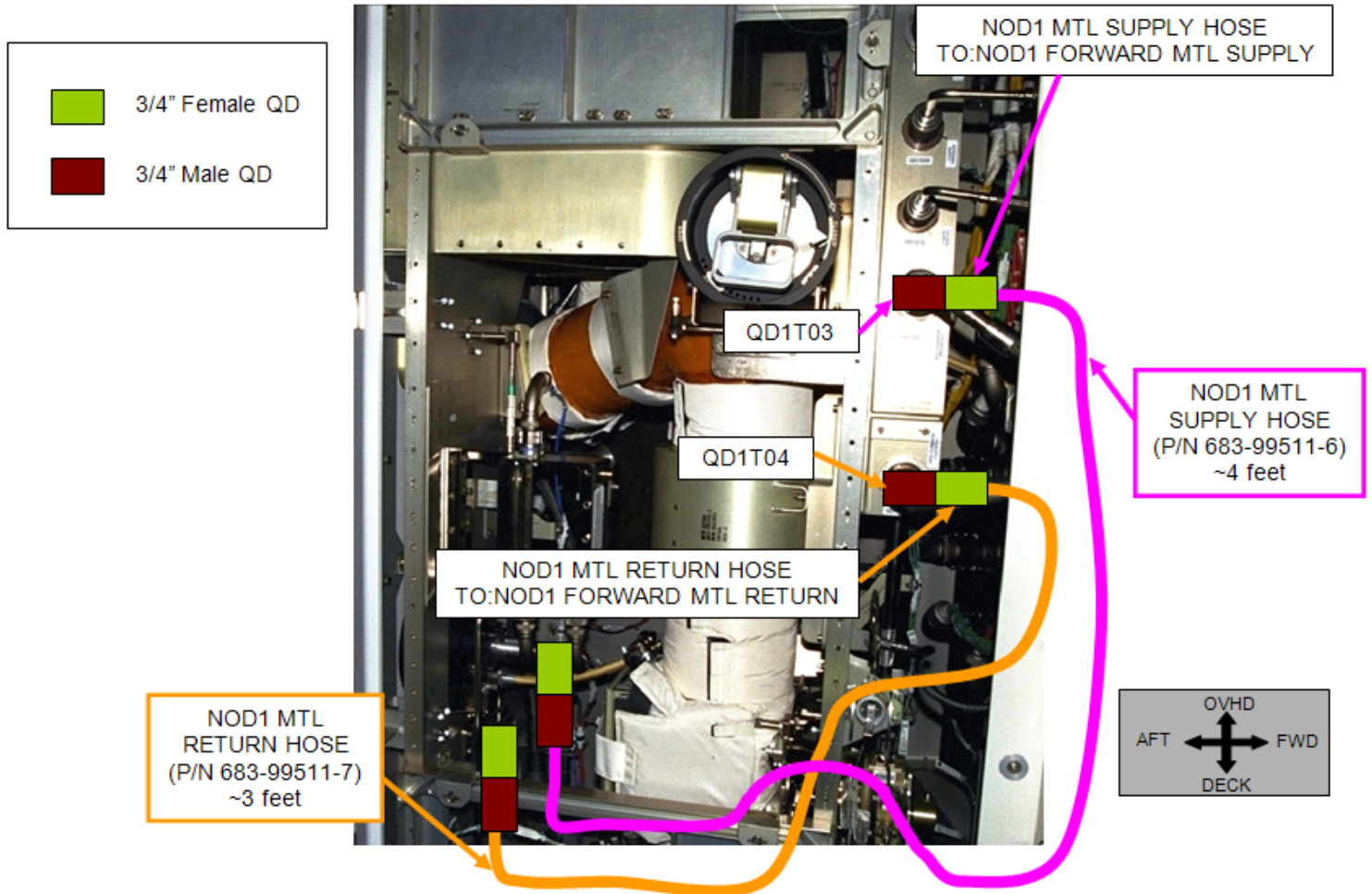


Figure 22.- Node 1 MTL Hose Final Configuration.

37.3 Removing 1/2" QD Plugs from Node 1 MTL Hoses

3/4" QD Plug ←|→ TO: NOD1 FORWARD MTL RETURN on NOD1

MTL RETURN HOSE →|← QD1T04

3/4" QD Plug ←|→ TO: NOD1 FORWARD MTL SUPPLY on NOD1
MTL SUPPLY HOSE

Refer to Figure 22.

37.4 Installing 1/2" QD Plugs on Demated QD Flexhoses

3/4" QD Plug →|← QD1T03 Flexhose

3/4" QD Plug →|← QD1T04 Flexhose

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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- 37.5 Mating Node 1 MTL Supply Hose to ITCS QD Panel
TO: NOD1 FORWARD MTL SUPPLY on NOD1 MTL SUPPLY HOSE
→|← QD1T03
Refer to Figure 22.
- 37.6 Mating Node 1 MTL Return Hose to ITCS QD Panel
TO: NOD1 FORWARD MTL RETURN on NOD1 MTL RETURN HOSE
→|← QD1T04
Refer to Figure 22.
- 37.7 ISS ↓ **MCC-H**: “Node 1 ITCS QD reconfiguration complete. Ready to open Node 1 MTL RFCA and initiate Node 3 ITCS flow.”
- 37.8 Secure disconnected QD Flexhoses (two) to structure.

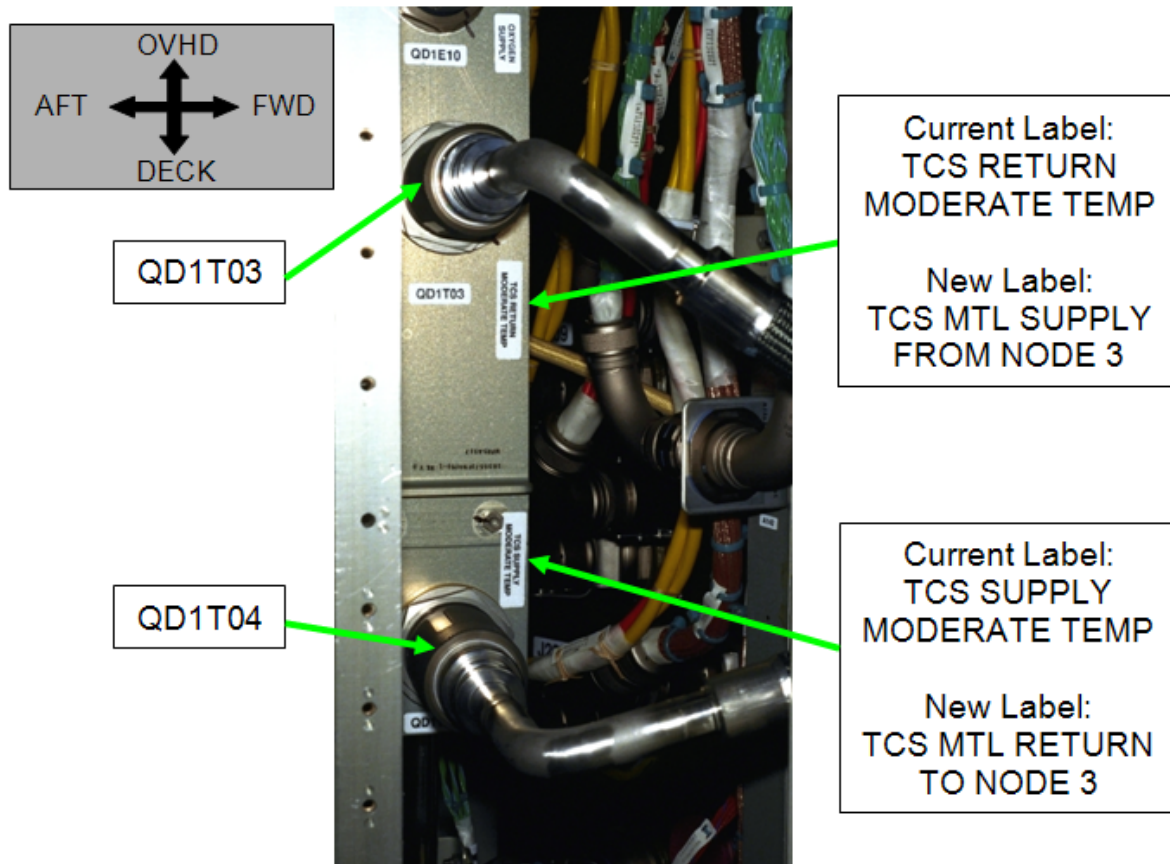


Figure 23.- Node 1 ITCS MTL QDs in Node 1 Port Alcove.

NOTE

New labels were flown with 20A Vestibule Outfitting hardware. If MTL Supply and MTL Return labels are not found, new labels can be fabricated using the Label Maker.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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37.9 Cover current TCS labels (Aluminum Tape).
Install new TCS MTL SUPPLY FROM NODE 3 (one) and TCS MTL
RETURN TO NODE 3 (one) labels.
Refer to Figure 23.

37.10 Photo document newly installed labels (Digital Camera).

38. INSTALLING NODE 1 PORT ALCOVE CLOSEOUT PANEL

38.1 Install Closeout Panel NOD1P1-01, fasteners (twelve) (Ratchet, 3/8"
Drive; 5/32" Hex Head, 3/8" Drive).
Refer to Figure 14.

39. SAFING FSS (IF REQUIRED)

39.1 sw FSS MAIN POWER → OFF

39.2 Verifying FSS Power and Valve Positions:

√MODE SELECTION VALVE	- INACT
√MV1	- BYPASS
√MV2	- CLOSE
√MV3	- DF1/SUPPLY

39.3 Gamah Cap →|← AIR EXIT on FCPA, hand tighten.
Refer to Figures 1 and 2.

PCS

39.4 Closing VRIV

Node 3: ECLSS: PCA

Node 3 ACS

'Pressure Control Assembly'

sel VRIV (Icon)

Node 3 PCA VRIV

'Close'

cmd Close (Verify Position – Closed)

39.5 Enabling Positive Pressure Relief (PPR)

Node 3: ECLSS: PCA: PCA Commands

Node 3 PCA Commands

'Positive Press Relief'

'Enable'

cmd Enable (Verify Positive Pressure Relief State – Enabled)

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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- MCC-H** 39.6 Enabling Node 3 PPR Failure Caution
C&W Summ
Caution & Warning Summary
'Event Code Tools'

sel Enable

Enable an Event

input Event Code – 1 7 0 5 3 ('Positive P Relief Failure - Node 3')

cmd Execute
- NOD3F0** 39.7 Disconnecting from Node 3 Vacuum Access Port:
VAJ-83-1 35 ft ←|→ PCA Vacuum Access Port
Verify Gamah Cap seal free from FOD, damage.
Gamah Cap →|← VAJ-83-1 35 ft
- 39.8 Verify PCA Vacuum Access Port Gamah Cap seal free from FOD,
damage.
Gamah Cap →|← PCA Vacuum Access Port
- 39.9 Install Closeout Panel NOD3F0-03, fasteners (thirteen) (Ratchet, 3/8"
Drive; 5/32" Hex Head, 3/8" Drive).
- 39.10 Install Closeout Panel NOD3F0-02, fasteners (four) (Ratchet,
3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 39.11 ISS ↓ **MCC-H**, "FSS safing complete."
- FCPA** 40. RECONFIGURING FOR FSS OPS (IF REQUIRED)
40.1 Verifying FSS Power and Valve Positions:
√sw FSS MAIN POWER – OFF
√MODE SELECTION VALVE – INACT
√MV1 – BYPASS
√MV2 – CLOSE
√MV3 – DF1/SUPPLY
- 40.2 Gamah Cap ←|→ AIR EXIT on FCPA
Refer to Figures 1 and 2.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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- PCS 40.3 Verifying Vent and Relief Isolation Valve (VRIV), Vent and Relief Control Valve (VRCV) Closed
Node 3: ECLSS: PCA
 Node 3 ACS
'Pressure Control Assembly'
- sel VRCV (Icon)
- Node 3 PCA VRCV
- Verify Position – Closed
- Node 3: ECLSS: PCA
 Node 3 ACS
'Pressure Control Assembly'
- sel VRIV (Icon)
- Node 3 PCA VRIV
- Verify Position – Closed
- NOD3F0 40.4 Remove Closeout Panel NOD3F0-03, fasteners (thirteen) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 40.5 Remove Closeout Panel NOD3F0-02, fasteners (four) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 40.6 Gamah Cap ←|→ PCA Vacuum Access Port
Temporarily stow Gamah Cap.
- 40.7 Verify VAJ seal free from damage, debris on bent end of VAJ-83-1 35 ft.
- 40.8 VAJ-83-1 35 ft (bent end) →|← PCA Vacuum Access Port, hand tighten
Restrain VAJ-83-1 35 ft per crew preference.

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

(ASSY OPS/20A/FIN 1) Page 39 of 45 pages

MCC-H 40.9 Suppressing Node 3 PPR Failure Caution C&W Summ

Caution & Warning Summary

'Event Code Tools'

sel Suppress

Suppress Annunciation of an Event

input Event Code – 1 7 0 5 3 ('Positive P Relief Failure - Node 3')

cmd Arm

cmd Execute

NOTE

The following Caution message will be received after PPR is inhibited: '**Positive P Relief Failure - Node 3**'

No action required. This message will return to normal once PPR is re-enabled.

PCS 40.10 Disabling Positive Pressure Relief Node 3: ECLSS: PCA: PCA Commands

Node 3 PCA Commands

'PCA'

Verify State – Monitor

'Positive Pressure Relief'

'Inhibit'

cmd Arm (Verify Status – Armed)

cmd Inhibit (Verify Positive Pressure Relief Status – Inhibited)

40.11 Opening Vacuum Relief Isolation Valve (VRIV)

Node 3: ECLSS: PCA

Node 3 ACS

'Pressure Control Assembly'

sel VRIV (Icon)

Node 3 PCA VRIV

'Open'

cmd Arm (Verify Status – Armed)

cmd Open (Verify Position – Open)

40.12 sw FSS MAIN POWER → ON

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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41. CONFIGURING PWR FOR DRAINING FSS AND FSS JUMPERS

NOTE
Refer to Figure 24 for step 41.

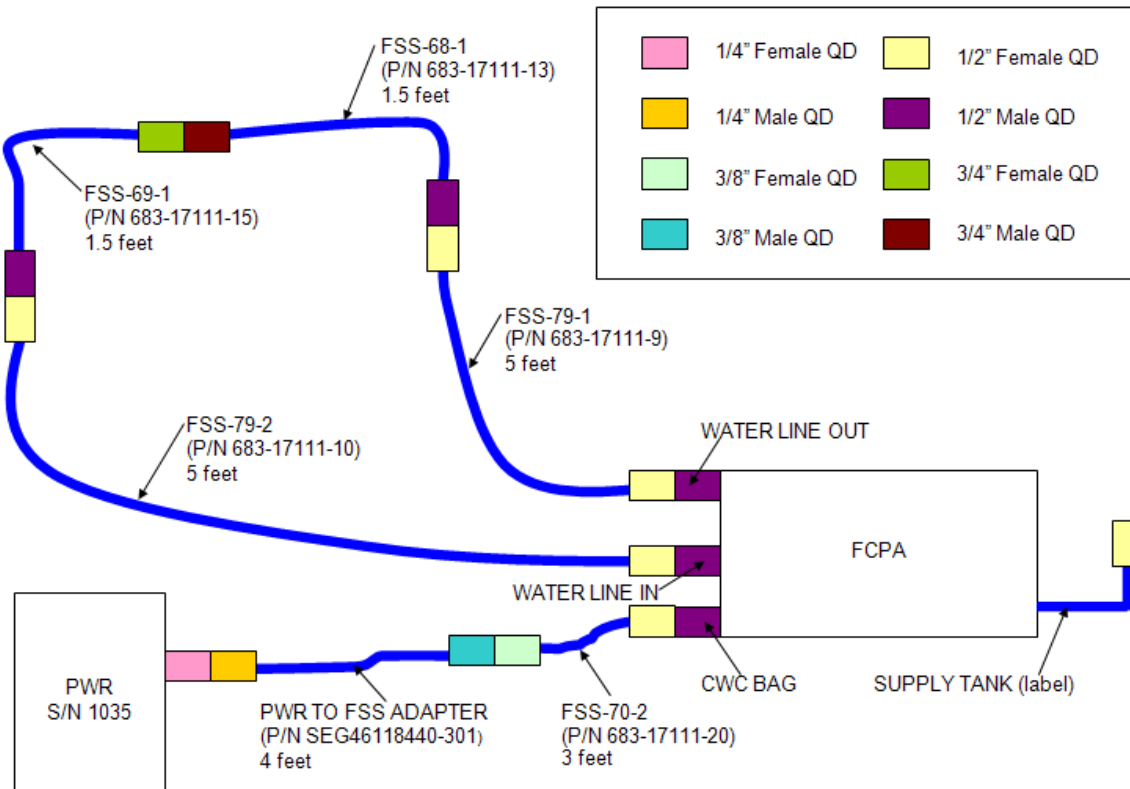


Figure 24.- FSS and FSS Jumper Drain and Purge Setup.

- FCPA
- 41.1 FSS-64-2 ←|→ SUPPLY TANK on FCPA
FSS-64-2 ←|→ PWR TO FSS ADAPTER
PWR S/N 1034 or 1002 ←|→ PWR TO FSS ADAPTER
 - 41.2 If required, label FSS-64-2, "WET" (Gray Tape, Sharpie).
 - 41.3 FSS-70-2 →|← CWC BAG on FCPA
PWR TO FSS ADAPTER →|← FSS-70-2
PWR TO FSS ADAPTER →|← PWR S/N 1035
 - 41.4 FSS-68-1 →|← FSS-69-1
√FSS-68-1 →|← FSS-79-1
√FSS-69-1 →|← FSS-79-2
√FSS-79-1 →|← WATER LINE OUT
√FSS-79-2 →|← WATER LINE IN

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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42. DRAINING FSS AND FSS JUMPERS

CAUTION
1. While in DRAIN, FILL, RECIRC mode (FSS Pump is on), PG1 (Pump Outlet Pressure) must be monitored to ensure FSS and ITCS lines do not become over pressurized.
2. PWR S/N 1035 must be monitored to avoid overfilling during DRAIN operations. If PWR S/N 1035 appears to approach the full point, MODE SELECTION VALVE should be rotated to INACT.

42.1 MV2 → OPEN

42.2 MODE SELECTION VALVE ↻ DRAIN (FCPA pump will turn ON)

42.3 Drain until PG-1 is in yellow range for 1 minute.

```
*****
* If PWR S/N 1035 appears to be approaching full
* | MODE SELECTION VALVE ↻ INACT
* |
* | √MCC-H for further instructions
* |
* If PG1 pressure > 40 psig
* | sw FSS MAIN POWER → OFF
* |
* | √MCC-H for further instructions
*****
```

42.4 MV2 → CLOSE

Drain for an additional 2 minutes.

43. PURGING FSS AND FSS JUMPERS FOR STOWAGE

43.1 MODE SELECTION VALVE ↻ PURGE/FILL
(FCPA pump will turn OFF)

43.2 MV2 → OPEN

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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- 43.3 Purge until PG-1 is in blue arc for 30 seconds.
This action should take less than 20 minutes.

Record PG1 pressure: _____ in Hg

Record PG2 pressure: _____ in Hg

* If blue arc is not reached for 30 seconds within 20 minutes
* MODE SELECTION VALVE ↻ INACT, then:

*

* MODE SELECTION VALVE ↻ DRAIN

*

* Drain until PG-1 is in yellow range for 30 seconds.

*

* If PWR S/N 1035 appears to be approaching full

* | MODE SELECTION VALVE ↻ INACT

*

* | √MCC-H for further instructions

*

* MV2 → CLOSE

*

* Drain an additional 2 minutes.

*

* If PWR S/N 1035 appears to be approaching full

* | MODE SELECTION VALVE ↻ INACT

*

* | √MCC-H for further instructions

*

* MODE SELECTION VALVE ↻ INACT

*

* Restart procedure from step 43.1.

* Notify MCC-H.

43.4 MV2 → CLOSE


43.5 MODE SELECTION VALVE ↻ INACT

43.6 Gamah Cap →|← AIR EXIT on FCPA, hand tighten

43.7 sw FSS MAIN POWER → OFF

44. DEMATING POWER CABLES

NOD3
UOP2
(NOD3A6)

44.1  POWER OUT – RESET (illuminated)

√FAULT/TEST – not illuminated

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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44.2 Disconnecting Power Cables

PS-120 CABLE (P2) TO 120 VDC LOAD on PS-120 Cable ←|→ J201
on FCPA

P2 TO 120 VDC POWER PLUG on PEEK, 120 VDC 12 AMP 20'

Extension Cable ←|→ PS-120 CABLE (P1) TO 120 VDC POWER
OR 1553 DATA SOURCE on PS-120 Cable

P1 TO 120 VDC POWER RCPT on PEEK, 120 VDC 12 AMP 20'

Extension Cable ←|→ NOD3 UOP2 J4

NOD3
UOP2
(NOD3A6)

44.3 POWER OUT – (green ENABLE)

FAULT/TEST – (green OK)

45. DISCONNECTING FROM VACUUM SOURCE

PCS

45.1 Closing VRIV

Node 3: ECLSS: PCA

'Pressure Control Assembly'

sel VRIV (Icon)

'Close'

cmd Close (Verify Position – Closed)

45.2 Enabling Positive Pressure Relief (PPR)

Node 3: ECLSS: PCA: PCA Commands

'Positive Press Relief'

'Enable'

cmd Enable (Verify Positive Pressure Relief State – Enabled)

MCC-H

45.3 Enabling Node 3 PPR Failure Caution

C&W Summ

'Event Code Tools'

sel Enable

input Event Code – 1 7 0 5 3 ('Positive P Relief Failure - Node 3')

cmd Execute

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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- FCPA 45.4 VAJ-83-1 35 ft (straight end) ←|→ VAJ CONNECTION on FCPA
- NOD3F0 45.5 Disconnecting from Node 3 Vacuum Access Port
VAJ-83-1 35 ft ←|→ PCA Vacuum Access Port
Verify Gamah Cap seal free from FOD, damage.
Gamah Cap →|← VAJ-83-1 35 ft
- 45.6 Verify PCA Vacuum Access Port Gamah Cap seal free from FOD, damage.
Gamah Cap →|← PCA Vacuum Access Port
- 45.7 Gamah Cap →|← VAJ-83-1 35 ft (both ends)
Hand tighten.
- 45.8 Install Closeout Panel NOD3F0-03, fasteners (thirteen) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 45.9 Install Closeout Panel NOD3F0-02, fasteners (four) (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- FCPA 46. DISCONNECTING AND STOWING FSS AND JUMPERS
- 46.1 Disconnecting All FSS Jumpers
FSS-79-1 ←|→ WATER LINE OUT
FSS-79-1 ←|→ FSS-68-1
FSS-69-1 ←|→ FSS-68-1
FSS-69-1 ←|→ FSS-79-2
FSS-79-2 ←|→ WATER LINE IN
- 46.2 If required, remove "WET" labels from FSS-79-1, FSS-79-2.
- 46.3 Disconnecting PWR
FSS-70-2 ←|→ CWC BAG QD on FCPA
FSS-70-2 ←|→ PWR TO FSS ADAPTER
PWR TO FSS ADAPTER ←|→ PWR S/N 1035
- Place Ziplock Bag over 1/4" QD on PWR TO FSS ADAPTER, secure with Kapton Tape.
- 46.4 If required, label FSS-70-2, "WET" (Gray Tape, Sharpie).
- 46.5 Notify **MCC-H** of the status of PWR S/N 1035, S/N 1034, S/N 1002.
- 46.6 Untether FCPA from Handrails.
- LAB106 46.7 Remove triangular restraint bracket.
Slide FCPA into LAB106 Rack.
Install triangular restraint bracket, and hand-tighten one bolt.
- 46.8 Reinstall Beta Cloth Closeout FSS stowage area (Velcro).

1.140 CUPOLA AND NODE 3/NODE 1 ITCS FILL USING FSS

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- 46.9 Stow all FSS jumpers, VAJ-83-1 35 ft, and 3/4" QD Plugs (two).
- 46.10 Remove Handrails and Adjustable Length Tether, then stow.
- 46.11 Check for FOD around work area within 1 m radius.
- 46.12 Notify **MCC-H** of task completion and all recorded values.

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1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

(ASSY OPS/20A/FIN 2) Page 1 of 18 pages

OBJECTIVE:

Transfer WRS-1 and WRS-2 (Water Recovery System) Racks from LAB1D4 and LAB1P4 to NOD3D5 and NOD3D4. This transfer activity demates all Rack umbilicals, releases K-BARs and Pivot Mechanisms, transfers each rack from the LAB and then structurally attaches each Rack in Node 3. Rack umbilicals are mated in a separate procedure.

LOCATION:

Start: LAB1D4 (LAB1P4)

Finish: NOD3D5 (NOD3D4)

DURATION:

3 hours, 25 minutes

40 minutes – Rack transfer prep

1 hour, 25 minutes – umbilical demate

80 minutes – Rack transfers

CREW:

Two (second crewmember required for transfer only)

PARTS:

Ziplock Bag labeled "WRS1 O₂ Caps/Plugs"

Ziplock Bag labeled "WRS1 Potable Water Caps/Plugs"

Ziplock Bag labeled "WRS2 Waste Water Caps/Plugs"

Ziplock Bag labeled "WRS Process Water Caps/Plugs"

Ziplock Bag labeled "WRS TCS Caps/Plugs"

Ziplock Bag labeled "WRS Pwr/Data Caps"

QD Plug (four) P/N 683-16348-813

MATERIALS:

Ziplock Bag

Gray Tape

Kapton Tape

Dry Wipes

Clean Room Gloves

Empty 3.0 CTB

AMP Pallet 3 (A3) P/N SEG52101140-301 (if required)

Povidone Iodine Pads (P/N 68548)

Regen ECLSS Tox-2 PPE Kit (P/N SEG42103702-302):

Surgical Mask

Safety Goggles

Silver Shield Gloves

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

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TOOLS:

Digital Camera

ISS IVA Toolbox:

Drawer 2:

- Ratchet, 3/8" Drive
- 9/16" Socket, 3/8" Drive
- (40-200 in-lbs) Trq Wrench, 3/8" Drive
- Ratchet, 1/4" Drive
- 5/16" Socket, 1/4" Drive

Drawer 3:

- 6" Long, 3/8" Hex Head, 3/8" Drive

Drawer 4:

- Wire Cutters
- Adjustable Joint Pliers, Straight Jaw

Drawer 5:

- Static Wrist Tether

NOTE

All directional references (up, down, left, right) are with respect to front face of Rack, as you face Rack, with feet oriented towards the pivot point.

1. RACK TRANSFER PREPARATION

1.1 ✓All unnecessary equipment protruding into Rack translation path has been removed, stowed (LAB, Node 1, Node 3)

NOD3D5

1.2 ✓ARIS Pivot Fitting Bottom Left (inside) (P/N 683-61711-31) installed on lower Standoff
✓K-BAR Capture Mechanisms (two) installed on upper Standoff link



Figure 1.- NOD3D5, WRS-1 Umbilicals in Launch Restraints.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

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NOTE

Utilities restrained on Node 3 Standoff need to be released to prevent interference with Rack during installation.

- 1.3 Release Umbilicals from Launch Restraints by cutting Zip Ties (two per umbilical) (Wire Cutters).
Release Ground Strap by cutting Zip Ties (two).
Refer to Figure 1.



Figure 2.- NOD3D4, WRS-2 Umbilicals in Launch Restraints.

- NOD3D4 1.4 Repeat steps 1.2 and 1.3 for second Rack bay.
Refer to Figure 2.
- LAB1P4 1.5 Restrain PWD Galley Supply Hose to LAB1P3 Rack, out of LAB1P4
rotation path.
- 1.6 Perform [1.291 WRS ACCESS](#), steps 2, 5 to 7 (SODF: S&M
NOMINAL: RACK), then:

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

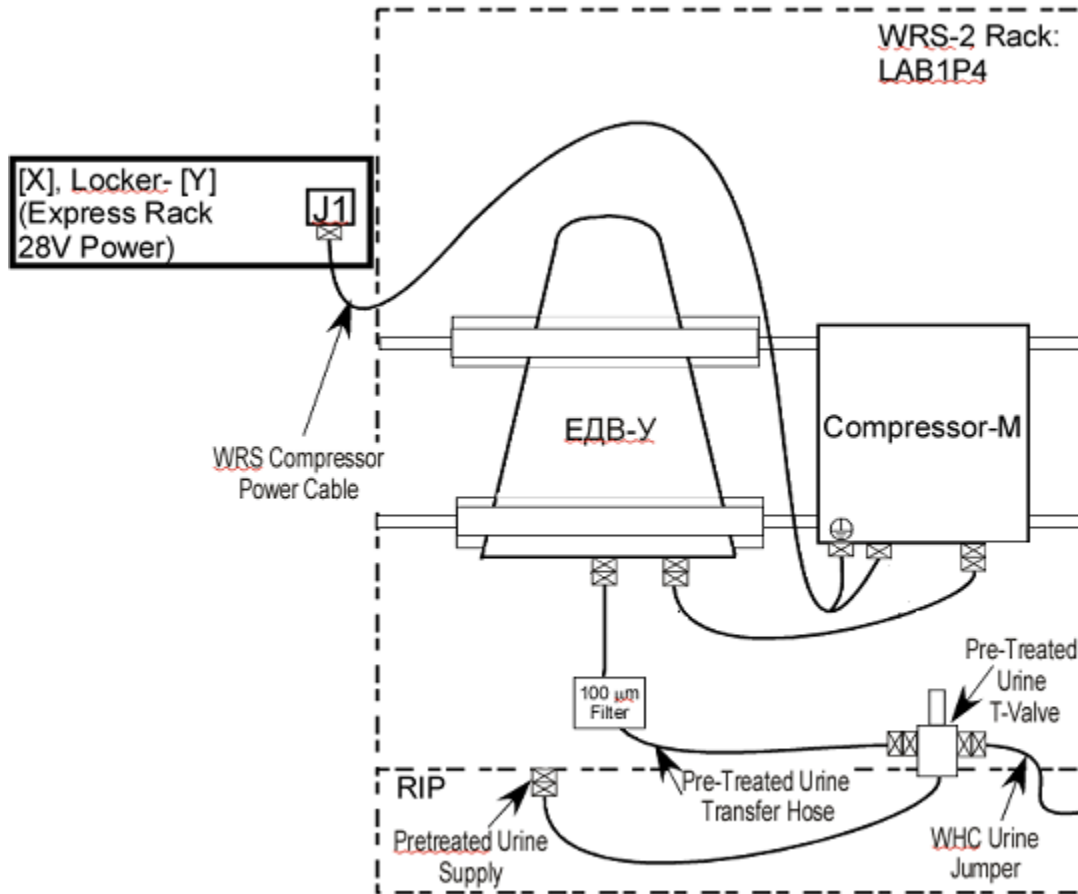


Figure 3.- EDV and Compressor setup on WRS-2.

1.7 Removing EDV and Compressor-M

Refer to Figure 3.

1.7.1 Don Static Wrist Tether.

LAB104

1.7.2 √sw LOCKER-4 POWER – OFF
√LOCKER-4 POWER Lt – Off

NOD3P4

1.7.3 Compressor-M Power Cable-P1 ←|→ LOCKER 4 POWER-J1
Cap →|← LOCKER 4 POWER-J1
Cap (or Kapton Tape) →|← WRS Compressor Power Cable P1

1.7.4 Doff Static Wrist Tether

WARNING

The UPA WSTA creates a positive pressure on the PRE-TREATED URINE SUPPLY QD. Removal of the Pre-treated Urine T-Valve from this QD without extra steps can result in the QD failing open and Tox-2 Fluid being released into the ISS cabin.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

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- 1.7.5 ✓ **MCC-H** to verify UPA WSTA in required configuration for disconnecting Pre-treated Urine T-Valve from WRS Rack 2 PRETREATED URINE SUPPLY
- 1.7.6 ✓ Pre-treated Urine T-valve → OFF (pull plunger, ~2.5 turns to OFF, verify black window, drop plunger)
- ЕДВ-У 1.7.7 Compressor-M Air Hose ←|→ ПОДАЧА ДАВЛЕНИЯ
- 1.7.8 Cap (tethered) → | ← Compressor-M Air Hose
Cap (tethered) → | ← ПОДАЧА ДАВЛЕНИЯ
- 1.7.9 Don Silver Shield Gloves, Surgical Mask, Safety Goggles.
- 1.7.10 WHC Urine Jumper ←|→ PRE-TREATED URINE T-VALVE
Install plug from Ziplock Bag taped to WHC Urine Jumper.
Cover T-valve male QD (Ziplock Bag; Gray Tape).
- 1.7.11 Feed WHC Urine Jumper back towards LAB1P3, and stow in LAB1P3 UIP area.
- 1.7.12 Pre-treated Urine T-Valve hose ←|→ PRETREATED URINE SUPPLY on WRS2
Pre-treated Urine T-Valve hose →|← PRE-TREATED URINE T-VALVE QD labeled WHC
Tox-2 specific Cap (in Ziplock labeled “Cap for Pre-treated Urine Supply RIP QD only” taped to UIP) →|← PRETREATED URINE SUPPLY on WRS2.
- 1.7.13 Doff Silver Shield Gloves, Surgical Mask, Safety Goggles.
- 1.7.14 Secure hoses to EDV Seat Track Brackets (Gray Tape).
- 1.7.15 Remove EDV Seat Track Brackets (two), seat track thumbscrews (four).
- 1.7.16 Temporarily stow assembly in Node 3 for installation after Rack transfers.
- LAB1S4 1.8 If installed, remove ARIS Microgravity Rack Barrier from Mounting Posts, latches (two).
Unscrew, remove Mounting Posts (two) from Standoff closest to WRS-1.
Temporarily stow.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

(ASSY OPS/20A/FIN 2) Page 6 of 18 pages

WARNING

1. Rack Power Jumpers must be the first jumpers demated from each Rack.
2. Prior to demating power jumpers, the Rack Power Switch status must be verified via PCS or ground telemetry. This cannot be accomplished if data cables have been demated.

2. SAFING

LAB1D4 2.1 √sw WRS-1 RACK POWER → OFF

MCC-H/
PCS 2.2 US Lab: EPS: Rack Power: Rack Power 3

Rack Power 3
'Rack LAB1D4'

Verify Switch Position – OFF

- √Switch availability – YES
- √Monitoring Status – ENABLED

LAB1P4 2.3 √sw WRS-2 RACK POWER → OFF

MCC-H/
PCS 2.4 US Lab: EPS: Rack Power: Rack Power 3

Rack Power 3
'Rack LAB1P4'

Verify Switch Position – OFF

- √Switch availability – YES
- √Monitoring Status – ENABLED

2.5 √**MCC-H** that the following has been performed
RPCM LA2A3B A RPC 1 is open and close cmd inhibited.
Either DDCU LA2A or DDCU LA3B Converter has been powered off.
Oxygen System safed for QD disconnection.

2.6 Remove WRS Closeout Assembly, seat track thumbscrews (two).
Temporarily stow.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

(ASSY OPS/20A/FIN 2) Page 7 of 18 pages

3. DEMATING ELECTRICAL CABLES

Refer to Figure 4.

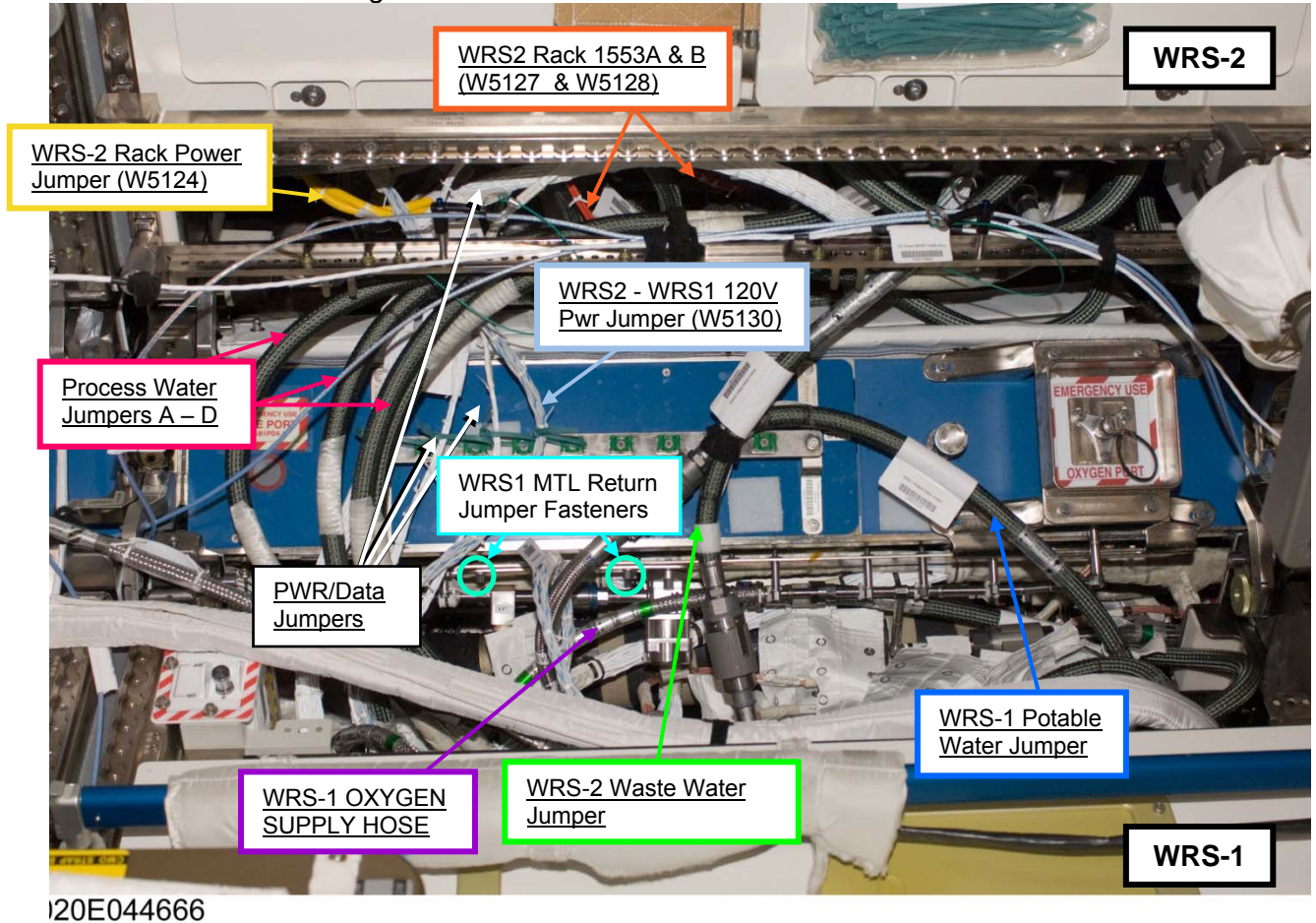


Figure 4.- WRS-1 and WRS-2 Jumpers.

3.1 Don Static Wrist Tether.
Secure to unpainted, unannodized metal surface.

LAB1PD4 3.2 For steps 3.3 to 3.13, install caps from Ziplock Bag labeled "WRS Pwr/Data Caps."
If cap not available, cover connector with Kapton Tape.

3.3 Demating WRS-2 Rack Power Jumper (W5124)
W5124-P1 ←|→ J1 on LAB1P4 ISPR Panel
W5124-P2 ←|→ J2 on Rack UIP
Release from WRS Jumper Support Bracket (Wire Cutters).
Stow in CTB.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

(ASSY OPS/20A/FIN 2) Page 8 of 18 pages

- 3.4 Demating WRS2 - WRS1 120V Pwr Jumper (W5130)
W5130-P2 ←|→ J2 on LAB1D4 Rack UIP
W5130-P6 ←|→ J6 on LAB1P4 Rack UIP
Release from WRS Jumper Support Bracket (Wire Cutters).
Stow in CTB.

- 3.5 Demating WRS1 J6 - WRS2 J7 Pwr/Data Jumper (W5131)
W5131-P6 ←|→ J6 on LAB1D4 Rack UIP
W5131-P7 ←|→ J7 on LAB1P4 Rack UIP
Release from WRS Jumper Support Bracket (Wire Cutters).
Stow in CTB.

- 3.6 Demating WRS1 J7 - WRS2 J8 Pwr/Data Jumper (W5132)
W5132-P7 ←|→ J7 on LAB1D4 Rack UIP
W5132-P8 ←|→ J8 on LAB1P4 Rack UIP
Release from WRS Jumper Support Bracket (Wire Cutters).
Stow in CTB.

- 3.7 Demating WRS-1 J8 - WRS-2 J9 Data Jumper (W5133)
W5133-P8 ←|→ J8 on LAB1D4 Rack UIP
W5133-P9 ←|→ J9 on LAB1P4 Rack UIP
Release from WRS Jumper Support Bracket (Wire Cutters).
Stow in CTB.

- 3.8 Demating WRS-2 Rack 1553A Jumper (W5127)
W5127-P3 ←|→ J3 on LAB1P4 ISPR Panel
W5127-P4 ←|→ J4 on Rack UIP
Stow in CTB.

- 3.9 Demating WRS-2 Rack 1553B Jumper (W5128)
W5128-P4 ←|→ J4 on LAB1P4 ISPR Panel
W5128-P5 ←|→ J5 on Rack UIP
Stow in CTB.

- 3.10 Demating WRS-2 Rack Data Jumper (W5129)
W5129-P43 ←|→ J43 on LAB1P4 ISPR Panel
W5129-P3 ←|→ J3 on Rack UIP
Stow in CTB.

NOTE

RPS Switch Position will show "On" on PCS display when
Rack Data Jumper is demated.

- 3.11 Demating WRS-1 Rack Data Cable (W5120)
W5120-P3 ←|→ J3 on Rack UIP
Stow in CTB.

W5120-P1 ←|→ Manual RFCA temperature sensor connector on
WRS-1 MTL Return Jumper
Secure in Standoff.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

(ASSY OPS/20A/FIN 2) Page 9 of 18 pages

- 3.12 Demating WRS-1 Rack 1553A Jumper (W5125)
W5125-J8 ←|→P8-W3305 (1553A Standoff umbilical)
Secure in standoff
W5125-P4 ←|→ J4 on Rack UIP
Stow in CTB.
- 3.13 Demating WRS-1 Rack 1553B Jumper (W5126)
W5126-J8 ←|→ P8-W3306 (1553B Standoff umbilical)
Secure in standoff
W5126-P5 ←|→ J5 on Rack UIP
Stow in CTB.
- 3.14 Doff Static Wrist Tether.

4. DEMATING FLUID LINES

4.1 Demating Process Water Jumpers

Cap and Plug both halves of QDs using Ziplock Bag labeled "WRS Process Water Caps/Plugs."



WRS Process Water A Jumper ←|→ "Process Water Line A" on both WRS Rack UIPs

WRS Process Water B Jumper ←|→ "Process Water Line B" on both WRS Rack UIPs

For WRS-1

| WRS Process Water C Jumper ←|→ "Process Water Line C" on WRS-1 Rack UIP

For WRS-2

| WRS Process Water C Jumper ←|→ check valve on "Process Water Line C" on WRS-2 Rack UIP

WRS Process Water D Jumper ←|→ "Process Water Line D" on both WRS Rack UIPs

Release from Velcro Straps.

Stow in CTB.

4.2 Demating WRS-2 Waste Water Jumper



Cap and Plug both halves of QDs using Ziplock Bag labeled "WRS2 Waste Water Caps/Plugs."

If QD cap(plug) not available

Cover QD with Ziplock Bag and secure with Gray Tape.

WRS-2 WASTE WATER JUMPER TO: X3 WASTE WATER BUS

←|→ LAB1D4 Waste Water Standoff umbilical

WRS-2 WASTE WATER JUMPER TO: WRS-2 WASTE WATER

←|→ WASTE WATER on Rack UIP

Release from Velcro Straps.

Stow in CTB.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

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4.3 For steps 4.4 to 4.7

Install caps and plugs from Ziplock Bag labeled "WRS TCS Caps/Plugs."

If QD cap(plug) not available

Cover QD with Ziplock Bag and secure with Gray Tape.

4.4 Demating WRS-1 MTL Return Jumper

MRFCA TO: MTL RETURN LAB1D4 JUMPER ←|→ MOD

TEMPERATURE COOLANT WATER RETURN in Standoff

MRFCA TO: WRS-1 MTL RETURN ←|→ TCS RETURN on Rack
UIP



Remove WRS-1 MTL Return Jumper mounting bracket, fasteners (two) from deck side of LAB1PD4 standoff (Ratchet, 1/4" Drive; 5/16" Socket, 1/4" Drive).

Refer to Figure 4.

Stow in CTB.

4.5 Demating WRS-1 MTL Supply Jumper

WRS-1 MTL SUPPLY JUMPER TO: X3 MTL SUPPLY ←|→ MOD
TEMPERATURE COOLANT WATER SUPPLY in Standoff

WRS-1 MTL SUPPLY JUMPER TO: WRS-1 TCS SUPPLY ←|→
TCS SUPPLY on Rack UIP

Stow in CTB.

4.6 Demating WRS-2 MTL Return Jumper

WRS-2 MTL RETURN JUMPER TO: LAB1P4 TCS MOD RETURN
←|→ TCS MOD RETURN on LAB1P4 ISPR Panel

WRS-2 MTL RETURN JUMPER TO: WRS-2 TCS RETURN ←|→
TCS RETURN on Rack UIP

Stow in CTB.

4.7 Demating WRS-2 MTL Supply Jumper

WRS-2 MTL SUPPLY JUMPER TO: LAB1P4 TCS MOD

SUPPLY ←|→ TCS MOD SUPPLY on LAB1P4 ISPR Panel

WRS-2 MTL SUPPLY JUMPER TO: WRS-2 TCS SUPPLY ←|→
TCS SUPPLY on Rack UIP

Stow in CTB.

WARNING

Contamination of Oxygen System may result in fire hazard.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

(ASSY OPS/20A/FIN 2) Page 11 of 18 pages

4.8 Oxygen Safety Steps

To prevent fire hazard during this procedure

Minimize the time connectors and caps(plugs) are open or cover using Teflon Bags or Clean Room Gloves.

If Clean Room Gloves become contaminated or damaged, replace immediately with new Clean Room Gloves.

If contaminants are found

Photo document (Digital Camera).

Remove using the Brass Picks.

Retain for return to Houston.

If contaminants cannot be completely removed

Temporarily cap connectors.


Notify **MCC-H**.

4.9 Don Clean Room Gloves.

4.10 For step 4.11

Install cap and plug from Teflon Bag labeled "WRS1 O₂ Caps/Plugs."

4.11 Demating WRS-1 Oxygen Supply Hose

 WRS-1 OXYGEN SUPPLY HOSE ← | → OXYGEN SUPPLY on Rack
UIP

Secure in Standoff (Velcro Straps).

WARNING

Contact with the wetted surfaces of the potable water system QDs may lead to contamination and crew illness.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

(ASSY OPS/20A/FIN 2) Page 12 of 18 pages

- 4.12 For step 4.13
| Install caps and plugs from Ziplock Bag labeled "WRS1 Potable Water Caps/Plugs."

- 4.13 Demating WRS-1 Potable Water Jumper
WRS-1 POTABLE WATER JUMPER TO: X3 FUEL CELL WATER BUS ←|→ FUEL CELL WATER in Standoff
WRS-1 POTABLE WATER JUMPER TO: WRS-1 POTABLE WATER RETURN ←|→ POTABLE WATER RETURN on Rack UIP
Release from Velcro Straps.
Stow in CTB.

If contact made with wetted surface of QD
Clean surface (Povidone Iodine Pads).

- 4.14 Doff Clean Room Gloves.

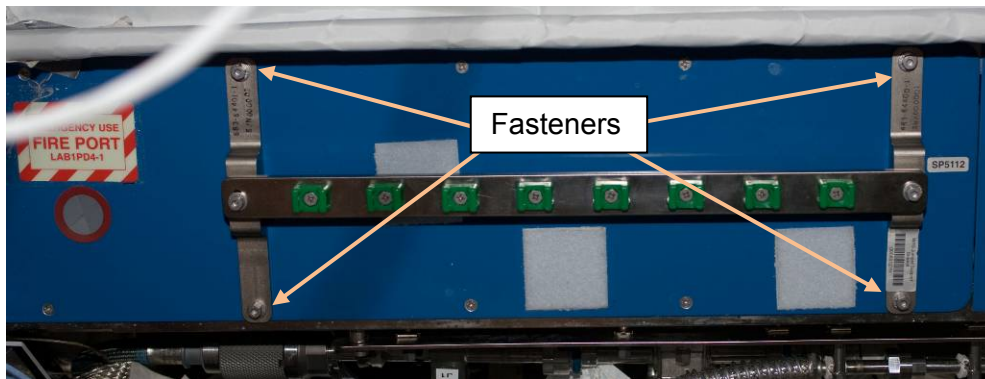


Figure 5.- WRS Jumper Support Bracket, Installed on LAB1PD4 Standoff.

- 4.15 Remove WRS Jumper Support Bracket, fasteners (four) (Ratchet, 1/4" Drive; 5/16" Socket, 1/4" Drive).
Temporarily stow.
Refer to Figure 5.

5. PIVOT MECHANISM KNOB DISENGAGEMENT

Refer to Figures 6 and 7.

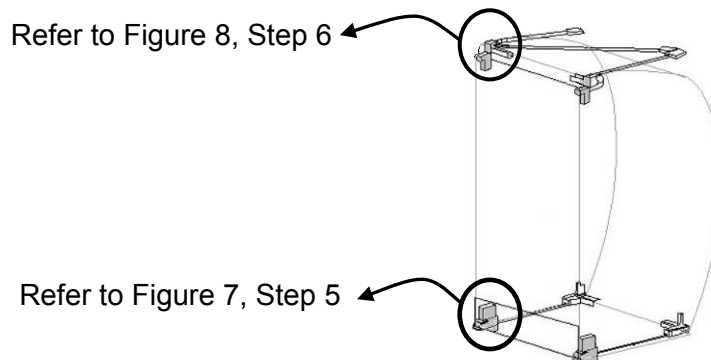


Figure 6.- Location of Rack Restraint Hardware.

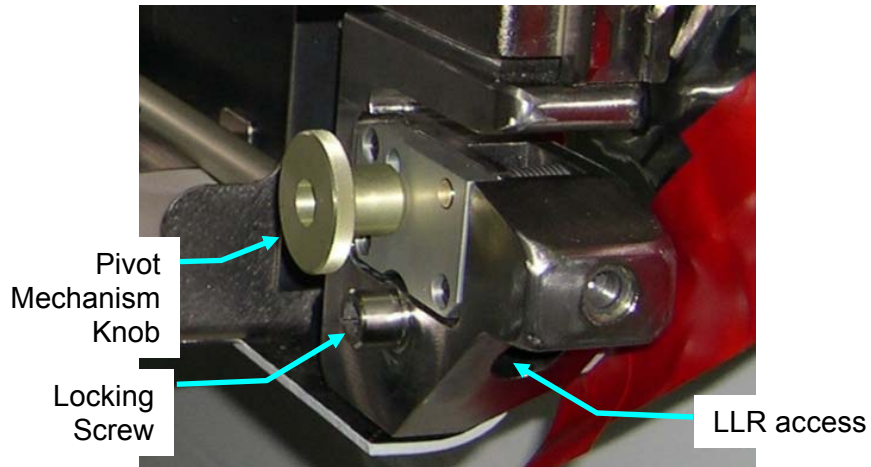


Figure 7.- WRS-2 Pivot Mechanism and Lower Launch Restraint (LLR), Right Side.

- LAB1P4 (LAB1D4) 5.1 Loosen Pivot Mechanism Knob one turn.
Snug in down position so Rack is free to lift off Pivot Fitting.
- 5.2 Repeat disengagement for opposite side.

6. K-BAR DISENGAGEMENT

Refer to Figures 6 and 8.

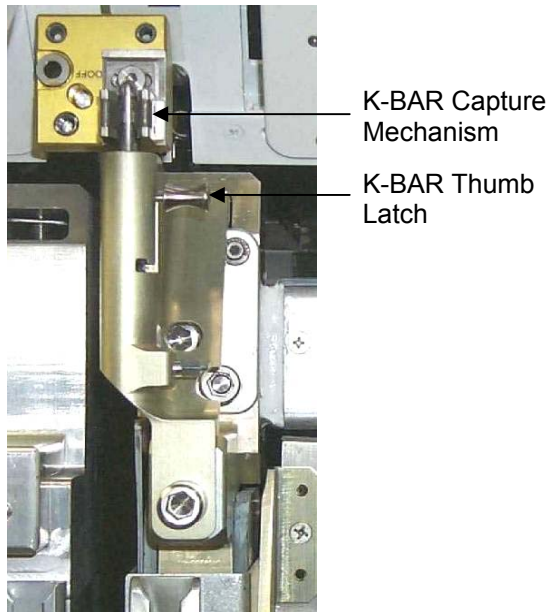


Figure 8.- K-BAR Shown Installed, Left Side.

- 6.1 Disengage Rack K-BAR Thumb Latch from Standoff.
- 6.2 Repeat disengagement for opposite side.

6.3 Slowly rotate Rack down to a controlled stop.

7. REMOVING GROUND STRAP

Refer to Figures 9 and 10.

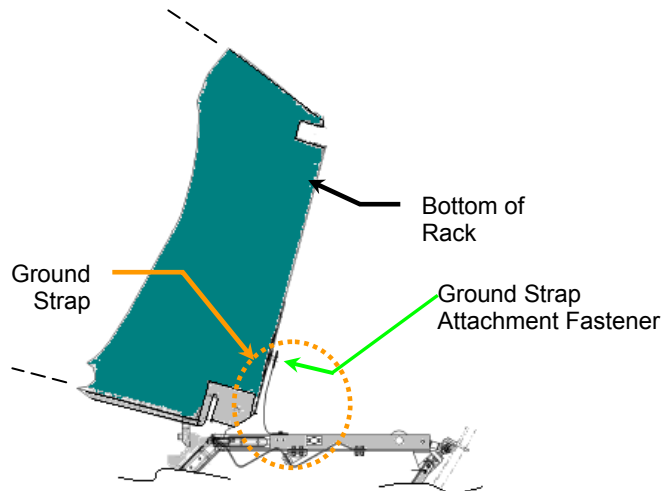


Figure 9.- Side View of Rotated Rack, Showing Rack Ground Strap Location.

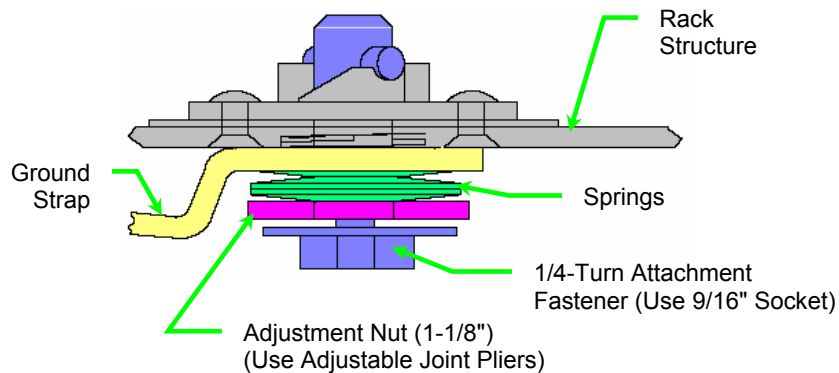


Figure 10.- Rack Ground Strap Cross Section.

- 7.1 Fully retract Adjustment Nut ↻ towards head of Attachment Fastener (Adjustable Joint Pliers, Straight Jaw).
- 7.2 Ground Strap ←|→ Rack, 1/4-Turn Attachment Fastener (Ratchet, 3/8" Drive; 9/16" Socket, 3/8" Drive)
- 7.3 Stow Ground Strap on Standoff location.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

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8. TRANSFERRING RACK TO NODE 3

8.1 Lift Rack off of Pivot Fittings.

NOTE

Due to the location of the Rack Power Switch, outside pivot fittings must be used on the right side to avoid interference.

The right side outer pivot fittings will transfer with the Racks.

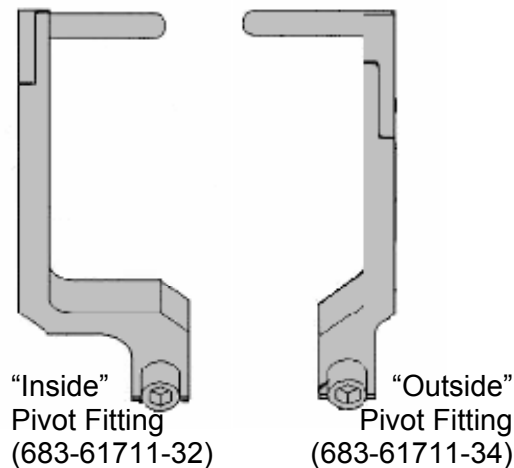


Figure 11.- ARIS Pivot Fitting Bottom Right, Outside vs. Inside.

8.2 Remove ARIS Pivot Fitting Bottom Right (outside) (P/N 683-61711-34) from lower Standoff (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive). Refer to Figure 11.

8.3 Loosen Mechanism Knobs so they are free to move. Refer to Figure 7.

8.4 Transfer WRS-1(WRS-2) Rack and Pivot Fitting to NOD3D5(NOD3D4).

NOD3D5(4) 8.5 Install, torque ARIS Pivot Fitting Bottom Right (outside), fastener (one) to 150 in-lbs [Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive; (40-200 in-lbs) Trq Wrench, 3/8" Drive].

8.6 Align Rack onto Standoff until Rack Pivot Latches engage standoff Pivot Pin Brackets. Keep rack rotated down.

8.7 Tighten both Pivot Mechanism Knobs in latched, up position.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

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9. INSTALLING GROUND STRAP

- 9.1 Inspect Ground Strap contact surfaces for debris, clean if required (Dry Wipes).
- 9.2 Fully retract Adjustment Nut ↺ (towards head of Attachment Fastener), by hand.
Refer to Figure 10.
- 9.3 Ground Strap →|← Rack, 1/4-Turn Attachment Fastener (Ratchet, 3/8" Drive; 9/16" Socket).
Refer to Figures 9 and 10.
- 9.4 Snug Adjustment Nut ↻, until firm against Springs.
- 9.5 Tighten Adjustment Nut an additional 1/2 to 3/4 turn ↻ (Adjustable Joint Pliers, Straight Jaw).
- 9.6 Photo document installed Ground Strap (Digital Camera).

10. FINAL INSTALLATION

- 10.1 √Rack rotation path is unobstructed
- 10.2 K-BAR Thumb Latches (two) → up position
Refer to Figure 8.

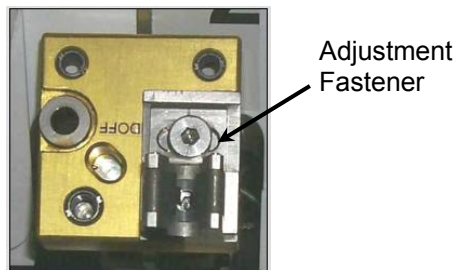


Figure 12.- K-BAR Capture Mechanism, Located on Upper Standoff.

- 10.3 Slowly rotate Rack up to a controlled stop.
Engage Rack K-BAR Thumb Latches (two) in K-BAR Capture Mechanism located on Columbus Standoff.

- * If K-BAR does not align with Capture Mechanism:
- * | Loosen Adjustment Fastener (Ratchet, 3/8" Drive; 5/32" Hex
- * | Head).
- * | Slide capture clip left or right, as required, to engage K-BAR.
- * | Once K-BAR engaged, re-tighten Adjustment Fastener
- * | (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- * | Refer to Figure 12.

- 10.4 Repeat steps 5 to 10.3 for other Rack.

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

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11. CLOSEOUT OR POST TRANSFER

11.1 Install EDV Seat Track Brackets (two) on aft end of WRS-2, seat track thumbscrews (four).

11.2 Photo document newly installed hardware (Digital Camera).

LAB1S4 11.3 If removed, Reinstall ARIS Microgravity Rack Barrier Mounting Posts (two) on LAB Standoff.
Reinstall ARIS Microgravity Rack Barrier onto Mounting Posts, latches (two).

11.4 Label CTB "WRS and OGS Lab Mod Kit Jumpers."
Stow remaining parts, tools, materials.
Notify **MCC-H** transfer activity for WRS-1 and WRS-2 is complete, CTB S/N.

Table 1. Jumpers Restow Table (in CTB)

OpNom	P/N
WRS-1 Jumpers	
WRS-1 MTL Return Jumper	683-63495-1
WRS-1 MTL Supply Jumper	683-63461-10
WRS-1 Potable Water Jumper	683-63461-11
WRS1 Rack 1553A Jumper	683-95125-1
WRS1 Rack 1553B Jumper	683-95126-1
WRS-2 Jumpers	
WRS-2 MTL Supply Jumper	683-63461-12
WRS-2 MTL Return Jumper	683-63461-13
WRS2 Rack Data Jumper	683-95129-1
WRS2 Rack 1553A Jumper	683-95127-1
WRS2 Rack 1553B Jumper	683-95128-1
Temporary OGS/WRS2 Rack Power Jumper	683-95124-1
WRS-2 Waste Water Jumper	683-63461-14
Rack to Rack Jumpers	
WRS1 J6 - WRS2 J7 Pwr/Data Jumper	683-95131-1
WRS1 J7 - WRS2 J8 Pwr/Data Jumper	683-95132-1
WRS1 J8 - WRS2 J9 Data Jumper	683-95133-1
WRS2 - WRS1 120V Pwr Jumper	683-95130-1
WRS Process Water A Jumper	683-63461-15
WRS Process Water B Jumper	683-63461-16
WRS Process Water C Jumper	683-63461-17
WRS Process Water D Jumper	683-63461-18

1.150 WRS-1 & WRS-2 RACK TRANSFER LAB TO NOD3

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Table 2. Closeout Bracket Restow

OpNom	P/N
WRS Closeout Assembly	
WRS Jumper Support Bracket	683-64400-1
WRS Closeout Assembly - Seat Track Bracket	683-64400-3

1.154 OGS RACK TRANSFER LAB TO NODE 3

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OBJECTIVE:

Transfer Oxygen Generation System (OGS) Rack from LAB1P1 to NOD3A5. This transfer activity demates all Rack umbilicals, releases K-BARs and Pivot Mechanisms, transfers the Rack from the LAB and then structurally attaches the Rack to the Node 3 module. Rack umbilicals will be subsequently remated using a separate procedure.

LOCATION:

Stowed: LAB1P1

Installed: NOD3A5

DURATION:

1 hour, 45 minutes

45 minutes - Demate Jumpers

30 minutes - Transfer

30 minutes - Install in Node 3, Closeout

CREW:

Two (second crewmember required for transfer only)

PARTS:

3.0 CTB labeled "WRS and OGS Lab Mod Kit Jumpers"

Ziplock Bag labeled "OGS Jumper Electrical Plugs"

Ziplock Bag labeled "OGS Jumper Fluid Plugs"

Ziplock Bag labeled "WHC/OGS Potable Water QD Caps"

Ziplock Bags (As required to replace Caps/Plugs)

Gray Tape

MATERIALS:

Dry Wipes

AMP Pallet 3, A3 (SEG52101140-301) (if required)

Povidone Iodine Pads (P/N 08486A7)

TOOLS:

Digital Camera

ISS IVA Toolbox:

Drawer 2:

Ratchet, 3/8" Drive

9/16" Socket, 3/8" Drive

5/32" Hex Head, 3/8" Drive

Ratchet, 1/4" Drive

6" Ext, 1/4" Drive

5/16" Socket, 1/4" Drive

(5-35 in-lbs) Trq Driver, 1/4" Drive

(40-200 in-lbs) Trq Wrench, 3/8" Drive

Drawer 3:

6" long, 3/8" Hex Head, 3/8" Drive

Drawer 4:

Wire Cutters

Adjustable Joint Pliers, Straight Jaw

Drawer 5:

Static Wrist Tether

25 JAN 10

1.154 OGS RACK TRANSFER LAB TO NODE 3

(ASSY OPS/20A/FIN 2) Page 2 of 16 pages

NOTE

All directional references (up, down, left, right) are with respect to front face of OGS, as you face Rack, with feet oriented towards the pivot point.

1. SAFING

LAB1P1 1.1 √sw RACK POWER – OFF

PCS 1.2 US Lab: EPS Rack Power: Rack Power 1
Rack Power 1
'Rack LAB1P1'

Verify Switch Position – Off
Verify Switch Avail – Yes
Verify Monitoring Status – Ena

1.3 √MCC-H to verify Rack power safing in place:
Either DDCU LA1A or DDCU LA4A converter Off, and
RPCM LA1A4A A RPC 2 Open, Close Cmd Inhibited, and
RPCM LA2B C RPC 3 Open, Close Cmd Inhibited.

1.4 √MCC-H to verify system is safed and H2 Vent Valve closed

2. RACK TRANSLATION PREPARATION

NOTE

Umbilicals restrained on Node 3 Standoff need to be released to prevent interference with Rack during installation.



Figure 1.- NOD3A5 Umbilicals in Launch Restraint.

1.154 OGS RACK TRANSFER LAB TO NODE 3

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- NOD3A5 2.1 Release Umbilicals from Launch Restraints by cutting Zip Ties (two per umbilical; Wire Cutters).
Release Ground Strap by cutting Zip Ties (two).
Refer to Figure 1.
- LAB1P1 2.2 ✓All unnecessary equipment protruding into rack translation path has been removed, stowed (US LAB, Node 1, Node 3)
- 2.3 If installed, remove ARIS Microgravity Rack Barrier from Mounting Posts, latches (two).
Unscrew, remove Mounting Posts (two) from Standoff closest to OGS.
Temporarily stow.
- 2.4 Remove any hardware or Handrails from the face of the Rack.
- If Water Delivery System is still connected on OGS
| Proceed to step 3.
- If Water Delivery System not connected on OGS, go to step 4.

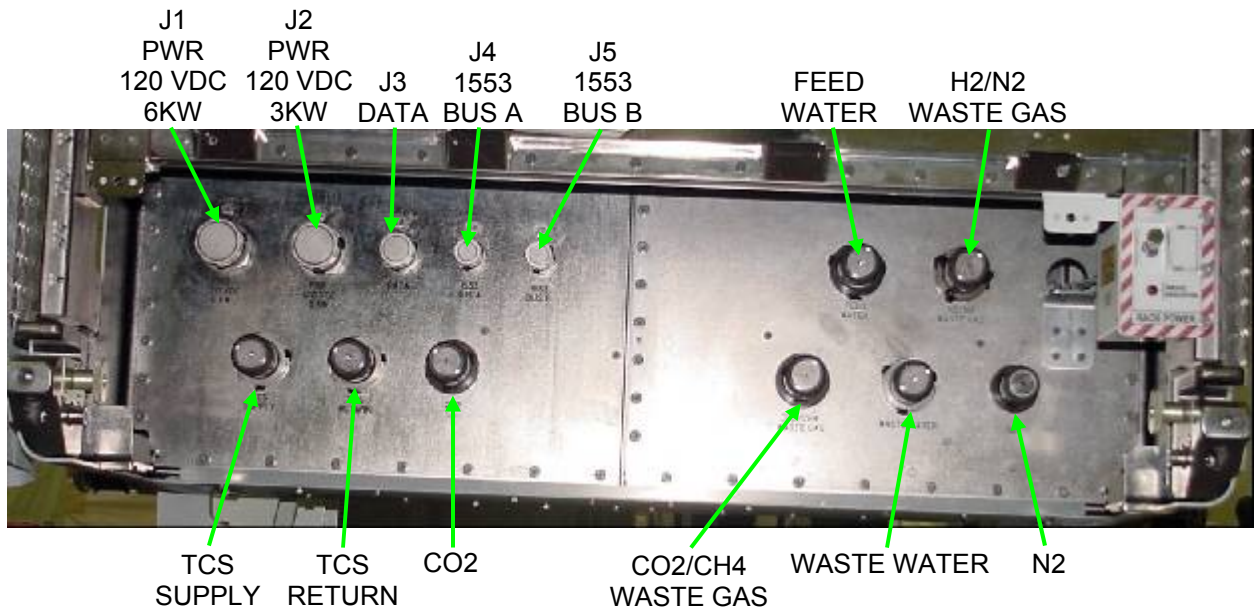


Figure 2.- OGS Rack Utility Interface Panel.

1.154 OGS RACK TRANSFER LAB TO NODE 3

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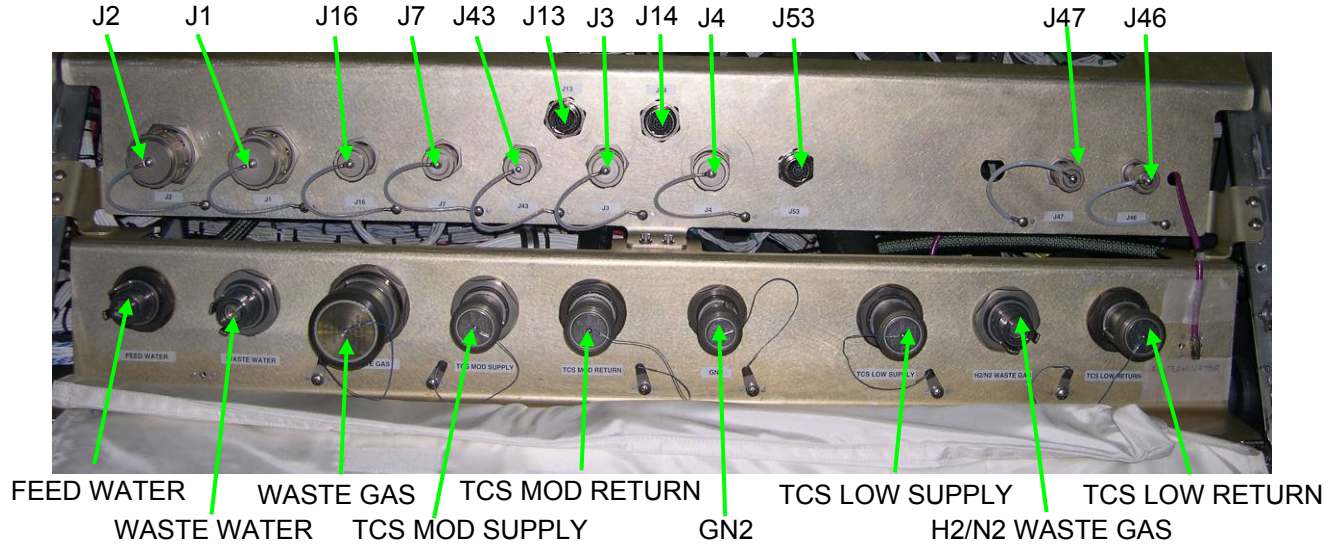


Figure 3.- LAB1P1 Modified Z-Panel.

NOTE

The Feed Water Hose in the Standoff did not fit through the Z-Panel cutout, it was routed around the Z-Panel instead.

1.154 OGS RACK TRANSFER LAB TO NODE 3

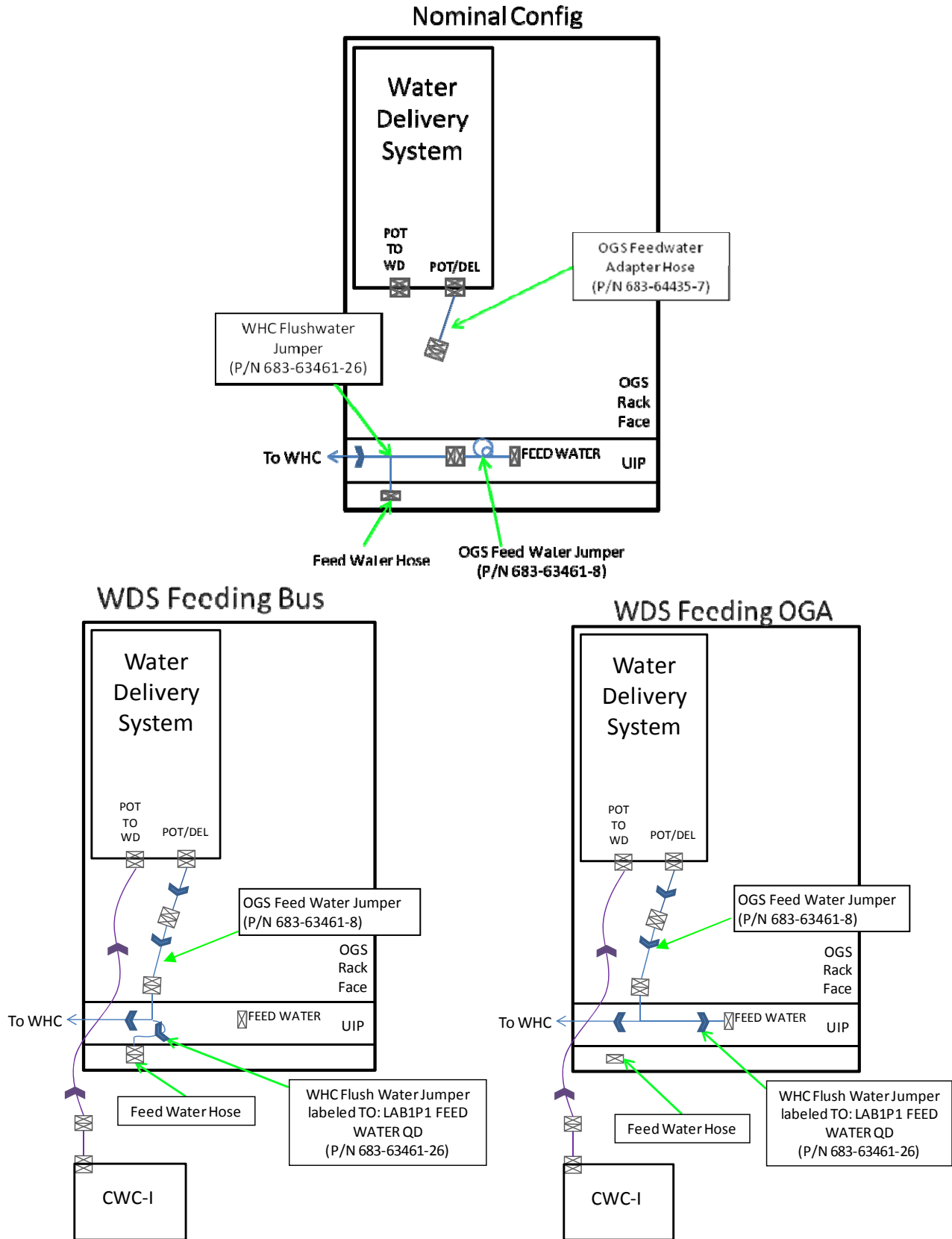


Figure 4.- Possible Potable Water System Connections.

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3. DEMATING POTABLE WATER UMBILICALS

Refer to Figures 2 to 4.

3.1 At any point in this procedure, if QD caps or plugs are not available, cover QD with Ziplock Bag and secure with Gray Tape.

LAB1P1 3.2 Remove UIP Closeout from Rack, 1/4 Turn fasteners (two).

WARNING

Contact with the wetted surfaces of the potable water system QDs can lead to contamination and crew illness.

3.3 If contact made with wetted surface of Potable Water QD, clean surface (Povidone Iodine Pads).

3.4 Retrieve Potable Water Plug from PWD:
1/2" QD Plug ←|→ 1/2" QD Cap, tethered to PWD Inlet

3.5 If Nominal Configuration (WPA feeding Potable Water Bus)

3.5.1 WHC Flush Water Jumper TO: OGS FEED WATER
JUMPER ←|→ OGS Feed Water Jumper TO: OGS FEED WATER

1/2" QD Cap, tethered →|← WHC Flush Water Jumper TO:
OGS FEED WATER JUMPER

1/2" QD Plug (From Ziplock Bag labeled "WHC/OGS
Potable Water QD Caps") →|← OGS Feed Water Jumper
TO: OGS FEED WATER

3.5.2 WHC Flush Water Jumper TO: LAB1P1 FEED WATER
QD ←|→ FEED WATER HOSE (routed past Z-Panel from
Standoff)

1/2" QD Plug (From PWD) →|← WHC Flush Water Jumper
labeled TO: LAB1P1 FEED WATER QD

1/2" QD Cap (tethered to Z-Panel) →|← FEED WATER
HOSE

3.5.3 OGS Feed Water Jumper TO: LAB1P1 FEED WATER/OGS
FEED WATER ADAPTER HOSE ←|→ FEED WATER
on OGS Rack

3.5.4 OGS Feed Water Jumper TO: LAB1P1 FEED WATER/OGS
FEED WATER ADAPTER HOSE →|← OGS Feed Water
Adapter Hose TO: OGS FEED WATER JUMPER

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(ASSY OPS/20A/FIN 2) Page 7 of 16 pages

- 3.6 If Water Delivery System configured to feed Potable Water Bus
 - 3.6.1 WHC Flush Water Jumper TO: OGS FEED WATER
JUMPER ←|→ OGS Feed Water Jumper TO: OGS FEED WATER

1/2" QD Cap, tethered →|← WHC Flush Water Jumper TO: OGS FEED WATER JUMPER

1/2" QD Plug (From Ziplock Bag labeled "WHC/OGS Potable Water QD Caps") →|← OGS Feed Water Jumper TO: OGS FEED WATER
 - 3.6.2 WHC Flush Water Jumper TO: LAB1P1 FEED WATER
QD ←|→ FEED WATER HOSE (routed past Z-Panel from Standoff)

1/2" QD Plug (From PWD) →|← WHC Flush Water Jumper labeled TO: LAB1P1 FEED WATER QD

1/2" QD Cap (tethered to Z-Panel) →|← FEED WATER HOSE
- 3.7 If Water Delivery System configured to feed OGA
 - 3.7.1 WHC Flush Water Jumper TO: OGS FEED WATER
JUMPER ←|→ OGS Feed Water Jumper TO: OGS FEED WATER

1/2" QD Cap, tethered →|← WHC Flush Water Jumper TO: OGS FEED WATER JUMPER

1/2" QD Plug (From Ziplock Bag labeled "WHC/OGS Potable Water QD Caps") →|← OGS Feed Water Jumper TO: OGS FEED WATER
 - 3.7.2 WHC Flush Water Jumper labeled TO: LAB1P1 FEED WATER QD ←|→ FEED WATER on OGS Rack

1/2" QD Cap (tethered to Z-Panel) →|← FEED WATER HOSE

1/2" QD Plug (From PWD) →|← WHC Flush Water Jumper labeled TO: LAB1P1 FEED WATER QD
- 3.8 Stow WHC Flush Water Jumper in 3.0 CTB labeled "WRS and OGS Lab Mod Kit Jumpers."
- 3.9 Remove Water Delivery System from LAB1P1, knobs (four) by hand. Temporarily stow Water Delivery System.

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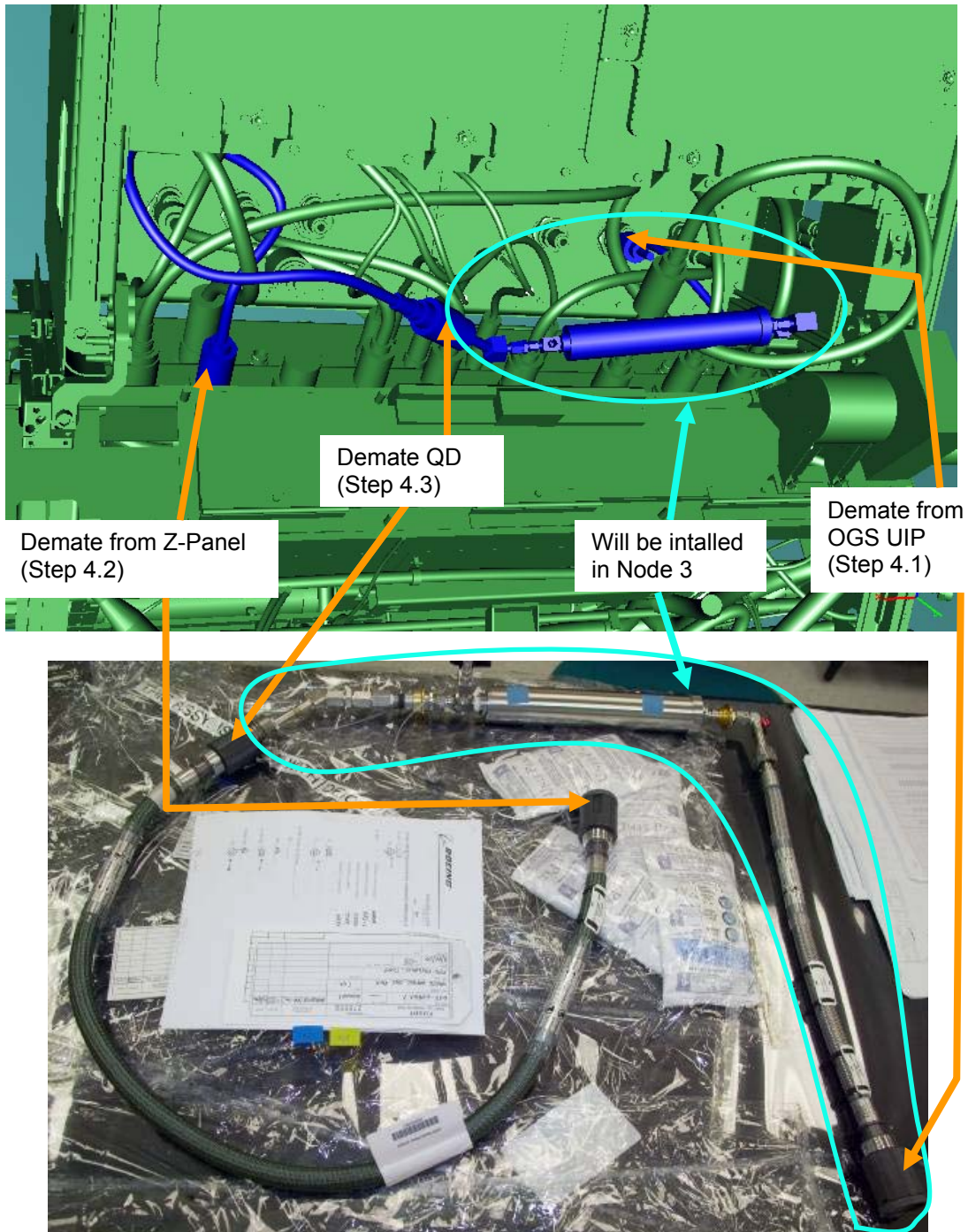


Figure 5.- OGS Waste Water Jumper (P/N 683-63461-7) - Check Valve Not Shown.

4. DEMATING WASTE WATER UMBILICAL

Refer to Figure 5.

4.1 OGS Waste Water Jumper labeled TO: OGS Waste Water ←|→
WASTE WATER on Rack UIP

1.154 OGS RACK TRANSFER LAB TO NODE 3

(ASSY OPS/20A/FIN 2) Page 9 of 16 pages

4.2 OGS Waste Water Jumper labeled TO: OGS Waste Water ←|→
WASTE WATER on Z-Panel

4.3 Green flex hose ←|→ metal line

Install plugs from Ziplock Bag “OGS Jumper Fluid Plugs” or tethered to the Z-Panel.

4.4 Stow green flex hose in 3.0 CTB labeled “WRS and OGS Lab Mod Kit Jumpers.”

4.5 Temporarily stow remaining portion of OGS Waste Water Jumper (Check Valve, ACTEX filter, and metal-braided hose) for later installation in Node 3.

5. DEMATING REMAINING FLUID UMBILICALS

Refer to Figures 2 and 3.

WARNING

OGS Rack Data Jumper must be removed last to ensure proper operation of Rack Power Switch. Failure to comply could result in electrical shock hazard.

Table 1. OGS Fluid Jumpers

OGS Rack Jumper	P/N	Z-Panel Connector	Rack Connector
OGS MTL Supply Jumper	683-63461-4	TCS MOD SUPPLY	TCS SUPPLY
OGS MTL Return Jumper	683-63461-5	TCS MOD RETURN	TCS RETURN
OGS Nitrogen Jumper	683-63461-6	GN2	N2
OGS H2/N2 Vent Jumper	683-63461-9	H2/N2 WASTE GAS	H2/N2 WASTE GAS

5.1 Remove fluid jumpers, demating both ends.
Refer to Table 1.

5.2 Install caps and plugs from Ziplock Bag “OGS Jumper Fluid Plugs” or tethered to the Z-Panel.

5.3 Stow Jumpers in 3.0 CTB labeled “WRS and OGS Lab Mod Kit Jumpers.”

6. DEMATING ELECTRICAL UMBILICALS PART 1

Refer to Figures 2 and 3.

1.154 OGS RACK TRANSFER LAB TO NODE 3

Table 2. OGS Electrical Jumpers

OGS Rack Jumper	P/N	Z-Panel Connector	Rack Connector
OGS Rack Pri Pwr Jumper	683-95134-1	J1	J1 PWR 120 VDC 6KW
OGS Rack Sec Pwr Jumper	683-95135-1	J2	J2 PWR 120 VDC 3KW
OGS Rack 1553A Y-Jumper	683-95112-1	J3	J4 1553 BUS A
OGS Rack 1553B Y-Jumper	683-95113-1	J4	J5 1553 BUS B

- 6.1 Don Static Wrist Tether.
Secure to unpainted, unannodized metal surface.
- 6.2 Demate electrical jumpers, demating both ends.
Do not demate OGS Rack Data Jumper at this time.
Refer to Table 2.
- 6.3 Install electrical caps from Ziplock Bag labeled "OGS Jumper Electrical Plugs."
- 6.4 Stow Jumpers in 3.0 CTB labeled "WRS and OGS Lab Mod Kit Jumpers."

7. DEMATING ELECTRICAL UMBILICALS PART 2

Refer to Figures 2 and 3.

NOTE
RPS Switch Position will show "On" on PCS display when Rack Data Jumper is demated.

Table 3. OGS Electrical Jumper

OGS Rack Jumper	P/N	Z-Panel Connector	Rack Connector
OGS Rack Data Jumper	683-95136-1	J43	J3
		J53	

- 7.1 Demate OGS Rack Data Jumper, demating both ends.
Refer to Table 3.
- 7.2 Install electrical caps from Ziplock Bag labeled "OGS Jumper Electrical Plugs."
- 7.3 Doff Static Wrist Tether.

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- 7.4 Stow OGS Rack Data Jumper in 3.0 CTB labeled "WRS and OGS Lab Mod Kit Jumpers."
Temporarily stow CTB.

8. SAFING AND REMOVING SMOKE DETECTOR

MCC-H/
PCS

8.1 Deactivating and Safing Smoke Detector

LAB Fire Display
'Smoke Detectors'

sel PD1

LAB1 PD1Smoke Detector
'Monitoring'

cmd Inh

√Status – Inhibited

sel RPCM_LA1B_H_RPC_03

RPCM_LA1B_H_RPC_03

cmd RPC Position – Open (Verify – Op)

cmd Close Cmd – Inhibit (Verify – Inh)

LAB1PD1

8.2 Removing Smoke Detector

8.2.1 P1-W3360 ←|→ J1

8.2.2 Remove Fasteners (four) securing Smoke Detector Bracket to Standoff (Ratchet, 1/4" Drive; 6" Ext, 1/4" Drive; 5/16" Socket, 1/4" Drive).

8.2.3 Cover connector plug, jack (small Ziplock Bag, Gray Tape).

8.2.4 Temporarily stow.

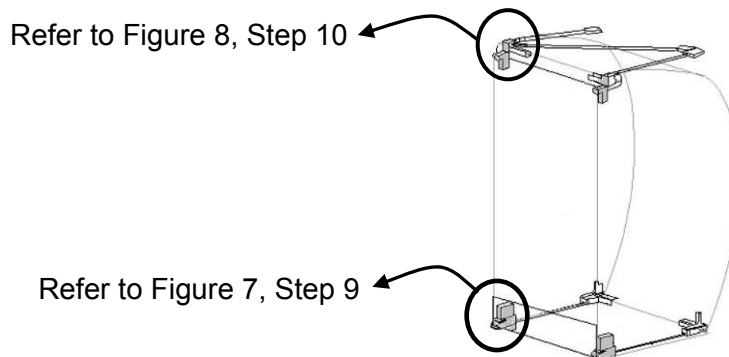


Figure 6.- Location of Rack Restraint Hardware.

1.154 OGS RACK TRANSFER LAB TO NODE 3

(ASSY OPS/20A/FIN 2)

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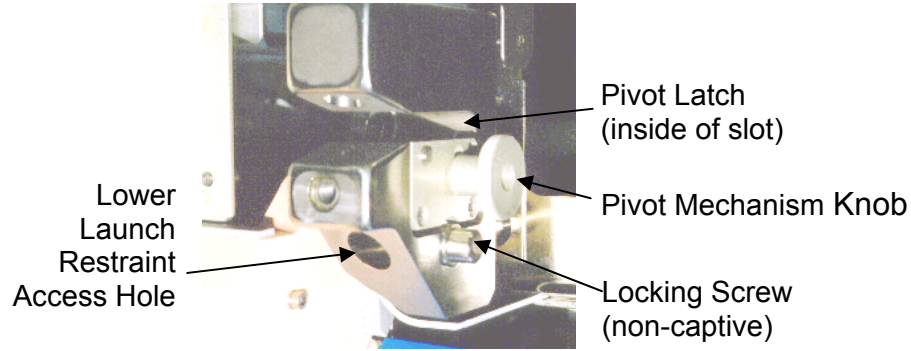


Figure 7.- Lower Launch Restraint, Left Side

9. PIVOT MECHANISM KNOB DISENGAGEMENT

Refer to Figures 6 and 7.

- 9.1 Loosen Pivot Mechanism Knob one turn.
Snug in down position so Rack is free to lift off Pivot Fitting.
- 9.2 Repeat disengagement for opposite side.

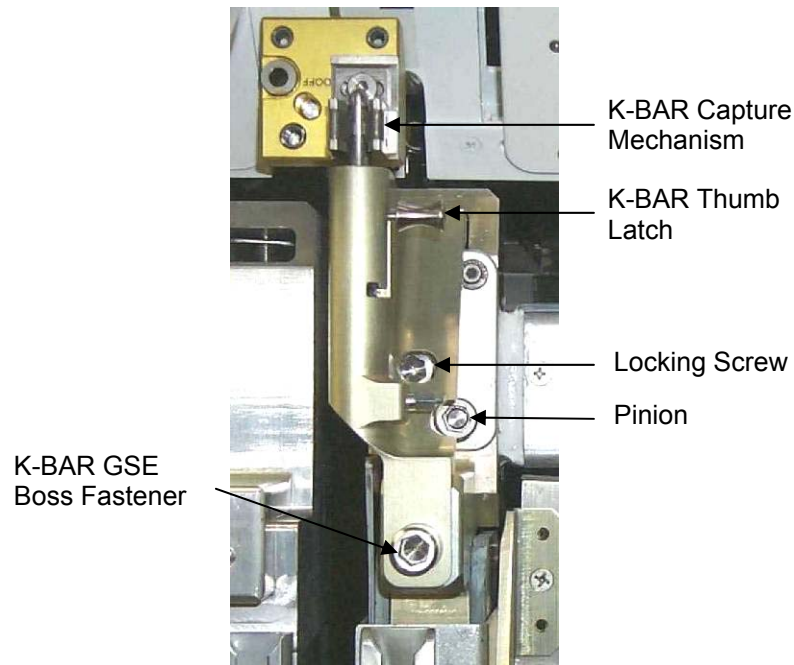


Figure 8.- K-BAR Shown Installed, Left Side.

10. K-BAR DISENGAGEMENT

Refer to Figures 6 and 8.

- 10.1 Disengage Rack K-BAR Thumb Latches (two) from Standoff.
- 10.2 Rotate Rack down to a controlled stop.

1.154 OGS RACK TRANSFER LAB TO NODE 3

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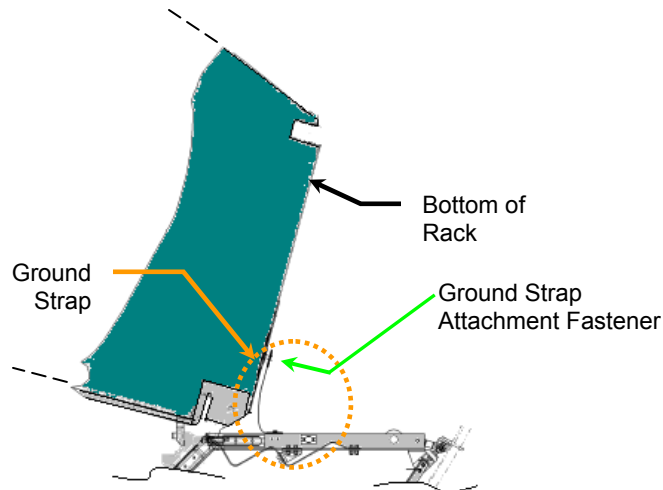


Figure 9.- Side View of Rotated Rack, Showing Rack Ground Strap Location.

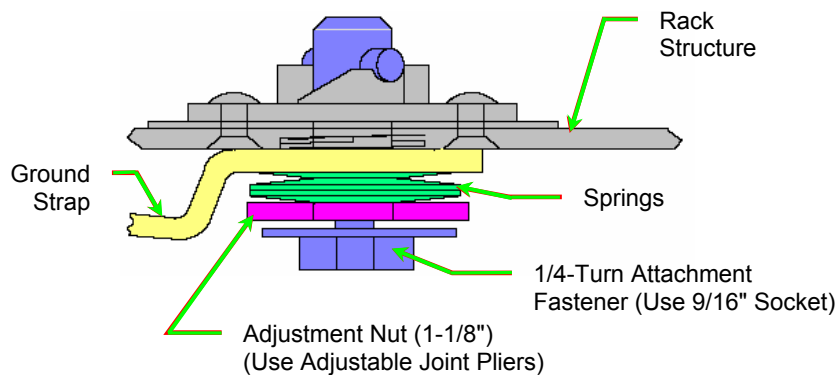


Figure 10.- Rack Ground Strap Cross Section.

11. REMOVING GROUND STRAP

Refer to Figures 9 and 10.

11.1 Fully retract Adjustment Nut ↻ towards head of Attachment Fastener (Adjustable Joint Pliers, Straight Jaw).

11.2 Ground Strap ←|→ Rack, 1/4-Turn Attachment Fastener (Ratchet, 3/8" Drive; 9/16" Socket, 3/8" Drive).

11.3 Stow Ground Strap into Standoff location.

12. TRANSFERRING OGS TO NODE 3

12.1 Lift Rack off of Pivot Fittings.

12.2 Loosen Mechanism Knobs one turn so they are free to move. Refer to Figure 7.

1.154 OGS RACK TRANSFER LAB TO NODE 3

(ASSY OPS/20A/FIN 2) Page 14 of 16 pages

- 12.3 Remove ARIS - Pivot Fitting Bottom Right (outside)
(P/N 683-61711-34) from lower standoff (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive)
- 12.4 Transfer OGS Rack and Pivot Fitting to NOD3A5.
- 12.5 Install, torque ARIS - Pivot Fitting Bottom Right (outside), fastener (one) to 150 in-lbs [Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head; (40-200 in-lbs) Trq Wrench, 3/8" Drive].
- NOD3A5 12.6 With Node 3 Umbilicals routed toward the front of the rack, align Rack onto Standoff until Rack Pivot Latches engage standoff Pivot Fittings.
Keep Rack rotated down.
- 12.7 Tighten both Pivot Mechanism Knobs in latched, up position.
13. INSTALLING GROUND STRAP
 - 13.1 Inspect Ground Strap contact surfaces for debris, clean if required (Dry Wipes).
 - 13.2 Fully retract Adjustment Nut ↶ (towards head of Attachment Fastener), by hand.
Refer to Figure 9.
 - 13.3 Ground Strap →|← Rack, 1/4-Turn Attachment Fastener (Ratchet, 3/8" Drive; 9/16" Socket, 3/8" Drive).
Refer to Figures 9 and 10.
 - 13.4 Snug Adjustment Nut ↷, until firm against Springs.
 - 13.5 Tighten Adjustment Nut an additional 1/2 to 3/4 turn ↷ (Adjustable Joint Pliers, Straight Jaw).
 - 13.6 Photo document installed Ground Strap (Digital Camera).
14. FINAL INSTALLATION
 - 14.1 √Rack rotation path is unobstructed
 - 14.2 K-BAR Thumb Latches (two) → up position
Refer to Figure 8.

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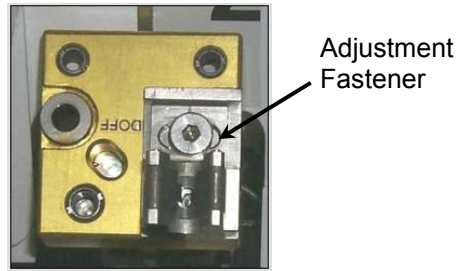


Figure 11.- K-BAR Capture Mechanism.

- 14.3 Slowly rotate Rack up to a controlled stop.
Engage Rack K-BAR Thumb Latches (two) in K-BAR Capture Mechanism located on upper Standoff.

- * If K-BAR does not align with Capture Mechanism:
- * | Loosen Adjustment Fastener (Ratchet, 3/8" Drive; 5/32" Hex
- * | Head, 3/8" Drive).
- * | Slide capture clip left or right, as required to engage K-BAR.
- * | Once K-BAR engaged, re-tighten Adjustment Fastener
- * | (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- * |
- * Refer to Figure 11.

15. REINSTALLING SMOKE DETECTOR

- LAB1PD1 15.1 Remove Ziplock Bag, Gray Tape, from connectors.

15.2 P1-W3360 →|← J1

15.3 Install Smoke Detector Bracket on standoff, fasteners (four)
(Ratchet, 1/4" Drive; 6" Ext, 1/4" Drive; 5/16" Socket, 1/4" Drive).

15.4 Tighten, torque Fasteners (four) to 22 in-lbs [Ratchet, 1/4" Drive;
6" Ext, 1/4" Drive; 5/16" Socket, 1/4" Drive; (5-35 in-lbs) Trq
Driver, 1/4" Drive].

16. CLOSEOUT OR POST TRANSFER

16.1 Notify **MCC-H** smoke detector installed, transfer activity complete.
Stow tools, materials, parts.

16.2 Photo document OGS in Node 3 and LAB1P1 Z-Panel (Digital
Camera).

1.154 OGS RACK TRANSFER LAB TO NODE 3

(ASSY OPS/20A/FIN 2) Page 16 of 16 pages

Table 4. Restow Table

OpNom	P/N
WHC Flush Water Jumper	683-63461-26
OGS Rack Data Jumper	683-95136-1
OGS Rack Pri Pwr Jumper	683-95134-1
OGS Rack Sec Pwr Jumper	683-95135-1
OGS Rack 1553A Y-Jumper	683-95112-1
OGS Rack 1553B Y-Jumper	683-95113-1
OGS MTL Supply Jumper	683-63461-4
OGS MTL Return Jumper	683-63461-5
OGS Nitrogen Jumper	683-63461-6
OGS H2/N2 Vent Jumper	683-63461-9
OGS Waste Water Jumper (Green Flex Hose)	683-63461-7
OGS Waste Water Jumper (ACTEX Hose)	

1.158 CUPOLA UTILITY OUTLET PANEL INSTALLATION

(ASSY OPS/20A/FIN 1)

Page 1 of 6 pages

OBJECTIVE:

Install UOPs and associated hardware in the Cupola.

LOCATION:

Installed: CUP1P1, CUP1S1

Stowed: √Inventory Management System (IMS)

DURATION:

60 minutes

CREW:

One

PARTS:

UOP 1 (located at CUP1P1) P/N 683-27710-5 S/N 1029

UOP 2 (located at CUP1S1) P/N 683-27710-5 S/N 1030

UOP Support Bracket (located at CUP1P1) P/N 1240CU751-401 B/C CUP0023E

UOP Support Bracket (located at CUP1S1) P/N 1240CU751-401 B/C CUP0024E

MATERIALS:

Dry Wipes

Gray Tape

Sharpie

TOOLS:

Digital Camera

ISS IVA Toolbox:

Drawer 2:

1/8" Hex Head, 1/4" Drive

3/16" Hex Head, 1/4" Drive

Driver Handle, 1/4" Drive

Ratchet, 1/4" Drive

(10-50 in-lbs) Trq Wrench, 1/4" Drive

(40-200 in-lbs) Trq Wrench, 1/4" Drive

Drawer 4:

Wire Cutters

Drawer 5:

Static Wrist Tether

1.158 CUPOLA UTILITY OUTLET PANEL INSTALLATION

(ASSY OPS/20A/FIN 1)

Page 2 of 6 pages

REFERENCED PROCEDURE(S):

1.110 GENERIC UOP ACTIVATION AND CHECKOUT

1. SAFING

Table 1. UOP Locations and Power Sources

Utility Outlet Panel [X]	Location [Q]	Power Source [Y]	Parallel DDCU Set	Data Sources	UOP Support Bracket B/C [T]
CUP UOP 1 (S/N 1029)	CUP1P1	RPCM N32A2B C2 RPC 17	N32A & N32B	System 1553	CUP0023E
CUP UOP 2 (S/N 1030)	CUP1S1	RPCM N32A2B D2 RPC 17	N32A & N32B	System 1553	CUP0024E

√**MCC-H** that the following is true:

[Y] is open and close command inhibited

Either DDCU N32A or DDCU N32B converter is powered off

2. UOP PANEL ASSEMBLY INSTALLATION

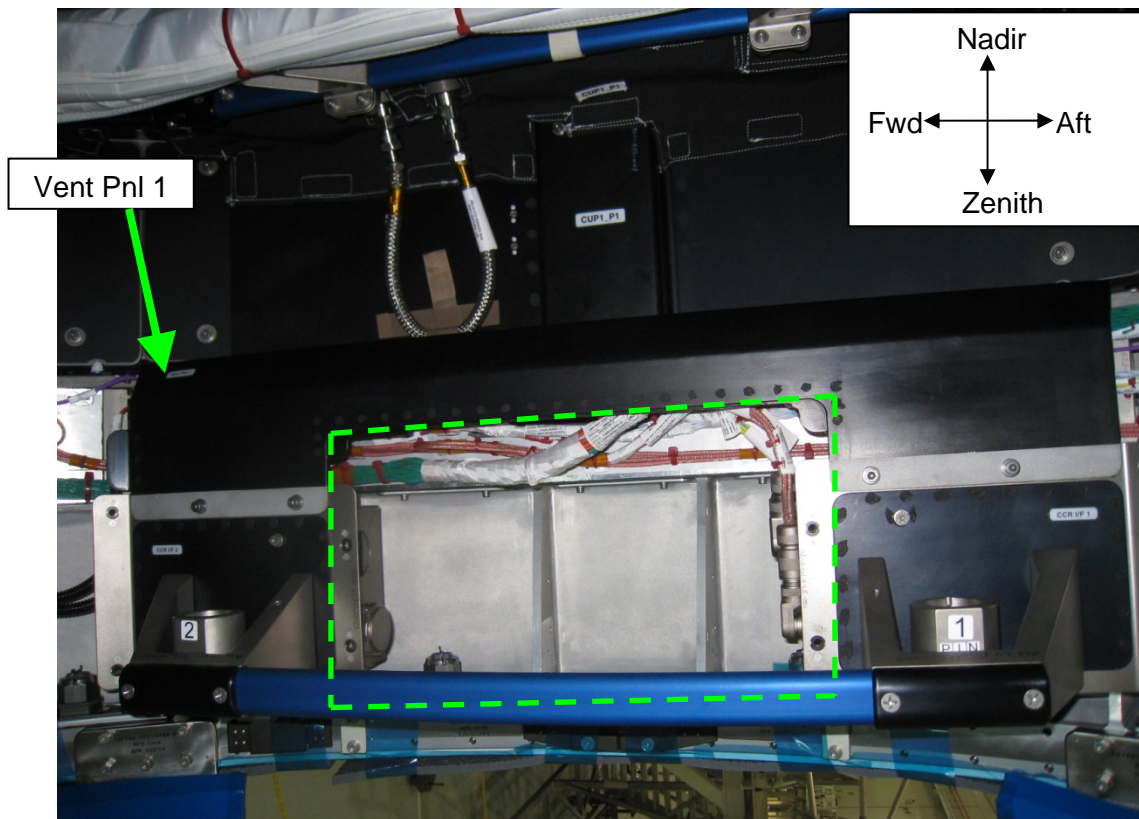


Figure 1.- UOP 1 Installation Area (Ground Photo Looking ISS Port).

1.158 CUPOLA UTILITY OUTLET PANEL INSTALLATION

(ASSY OPS/20A/FIN 1)



Figure 2.- UOP Support Bracket (Photos Taken at Bench Review).

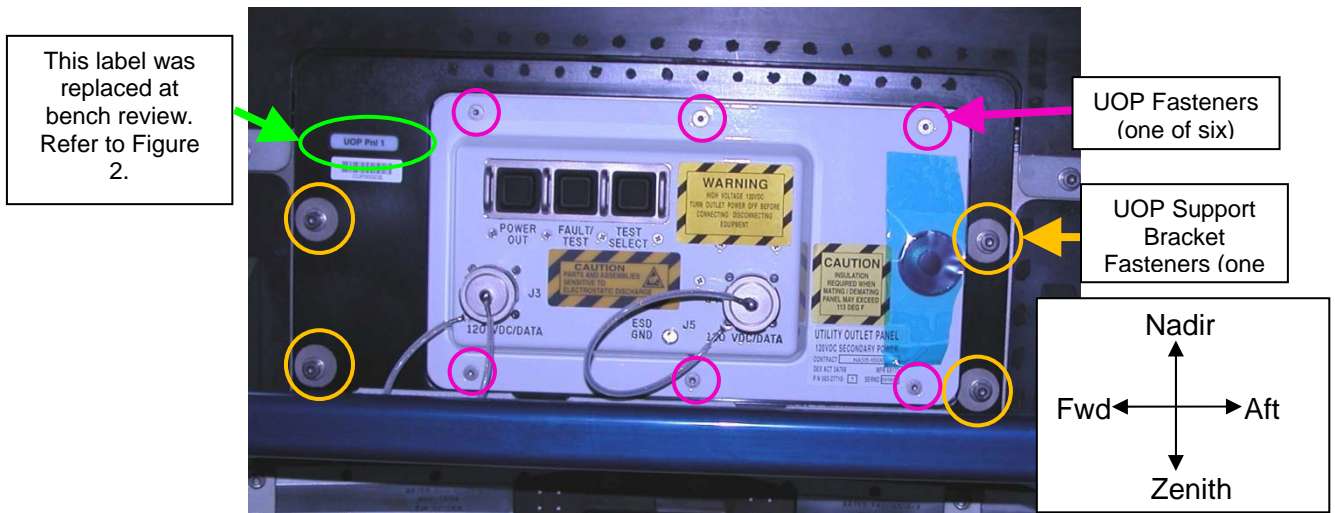


Figure 3.- UOP 1 Installed in UOP Support Bracket.

NOTE

The Cupola UOP Support Brackets have IMV deflector plates to distribute airflow entering from Node 3 throughout Cupola. Refer to Figure 2.

- Install UOP Support Bracket (B/C [T]) at [Q] by maneuvering behind handrail, fasteners (four).
- Tighten, torque UOP Support Bracket fasteners (four) to 115 in-lbs [Ratchet, 1/4" Drive; 3/16" Hex Head, 1/4" Drive; (40-200 in-lbs) Trq Wrench, 1/4" Drive].
- Refer to Figures 2 and 3.

1.158 CUPOLA UTILITY OUTLET PANEL INSTALLATION

(ASSY OPS/20A/FIN 1)

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3. UOP INSTALLATION

Table 2. UOP Connectors and Wire Harnesses

Utility Outlet Panel [X]	Input Power Wire Harness to UOP J1 [V]	Input Data Wire Harness to UOP J2 [U]	Power Wire Harness Dummy Connector Label [S]	Data Wire Harness Dummy Connector Label [R]
CUP UOP 1	UOP1_P1 CP2107F	UOP1_P2 CP2108F	Park UOP1 P1	Park UOP1 P2
CUP UOP 2	UOP2_P1 CP2107F	UOP2_P2 CP2108F	Park UOP2 P1	Park UOP2 P2

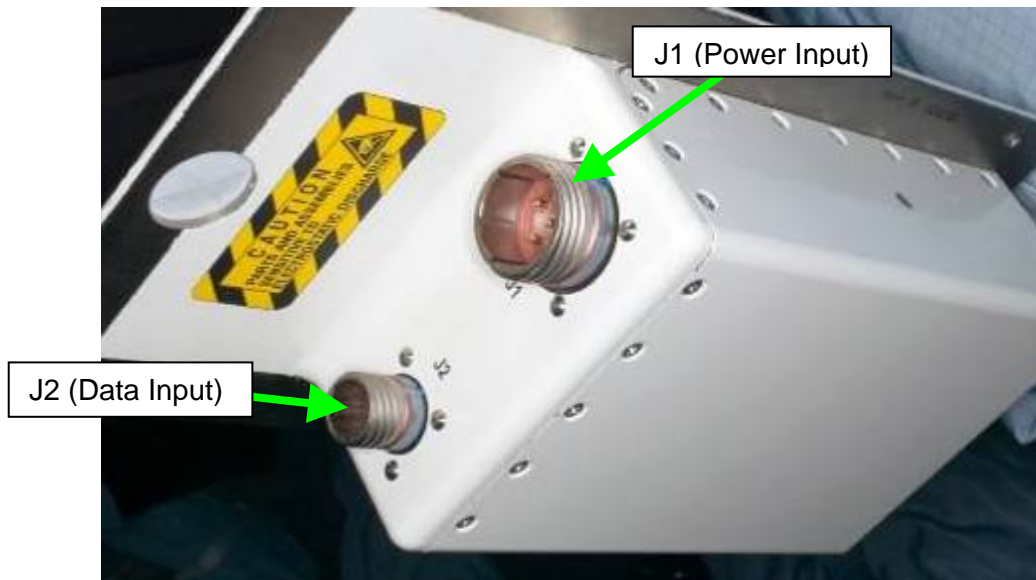


Figure 4.- Utility Outlet Panel Input Connectors (rear view of UOP).

1.158 CUPOLA UTILITY OUTLET PANEL INSTALLATION

(ASSY OPS/20A/FIN 1)

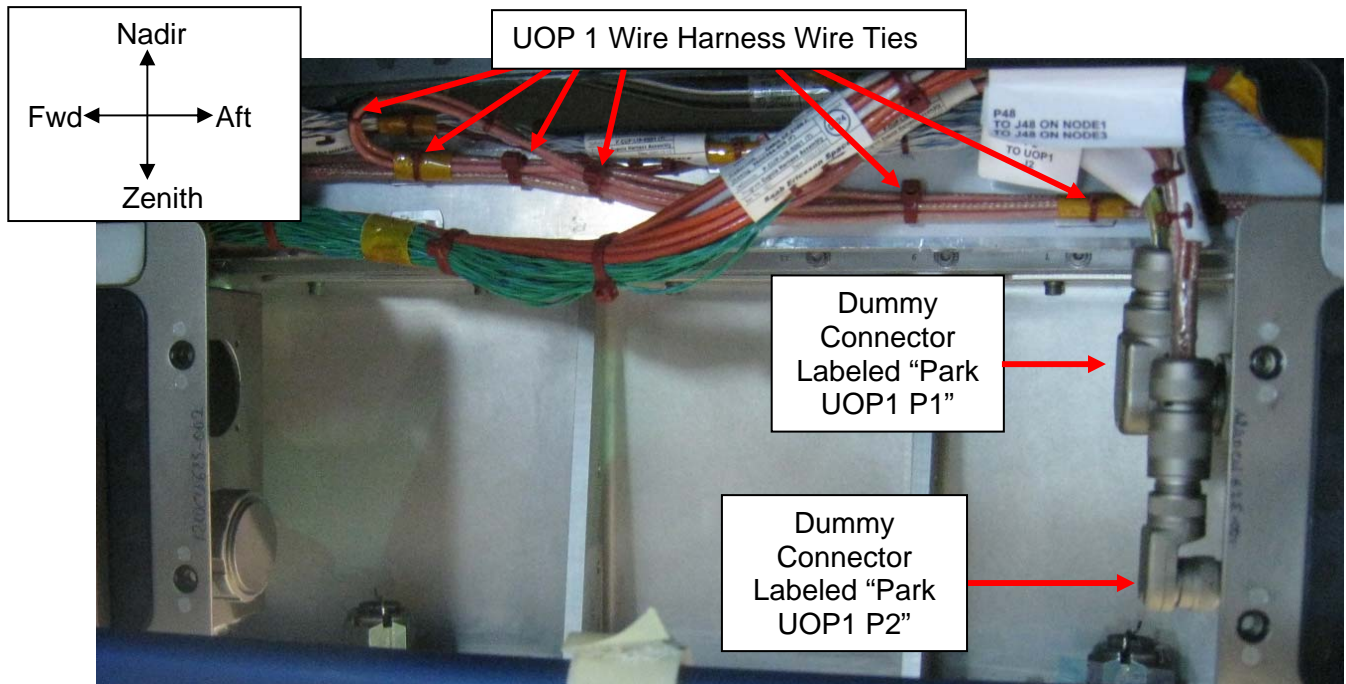


Figure 5.- CUP UOP 1 Installation Site.

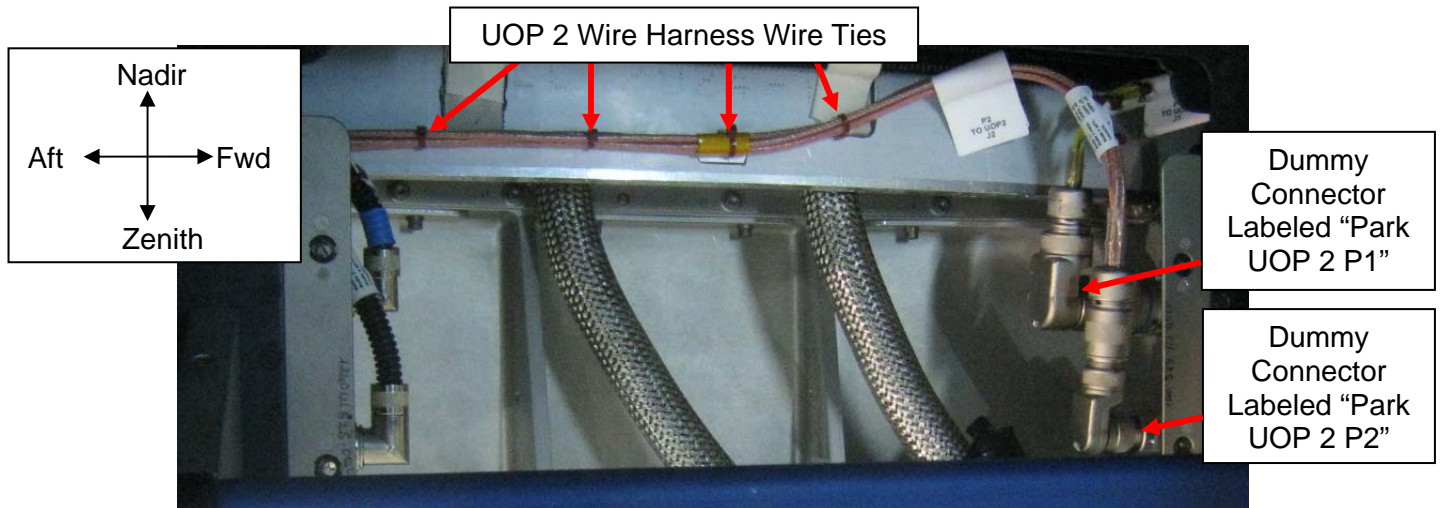


Figure 6.- CUP UOP 2 Installation Site.

- 3.1 Record P/N of [X]: _____
Record S/N of [X]: _____

WARNING

Care should be taken to only cut wire ties. If wire harnesses nicked or cut, could result in shock hazard.

- 3.2 As required, to provide adequate line length, cut wire ties securing UOP cables (Wire Cutters).

1.158 CUPOLA UTILITY OUTLET PANEL INSTALLATION

(ASSY OPS/20A/FIN 1)

Page 6 of 6 pages

Refer to Figures 5 and 6.

- 3.3 Don Static Wrist Tether.
Secure to unpainted, unanodized metal surface.
- 3.4 Demate Power Wire Harness [V] ←|→ Dummy Connector [S]
Demate Data Wire Harness [U] ←|→ Dummy Connector [R]
Refer to Table 2 and Figures 3, 4, and 5.
- 3.5 Route Power Wire Harness [V], Data Wire Harness [U] through opening in UOP Panel Assembly.
Remove protective caps on UOP, stow on Dummy Connector [S], Dummy Connector [R].
- 3.6 Input Power Wire Harness [V] →|← J1 on [X]
Input Data Wire Harness [U] →|← J2 on [X]
Refer to Table 2 and Figures 4, 5, and 6.
- 3.7 Install [X], assuring wire harnesses not pinched underneath UOP Support Bracket, fasteners (six).
Tighten, torque UOP Support Bracket to 30 in-lbs [Driver Handle, 1/4" Drive; 1/8" Hex Head, 1/4" Drive; (10-40 in-lbs) Trq Wrench, 1/4" Drive].
- 3.8 Doff static wrist tether.
- 3.9 Photo document final configuration (digital camera).
- 3.10 Repeat steps 1 to 3.9 for remaining Cupola UOP.
4. CHECKOUT
Perform 1.110 GENERIC UOP ACTIVATION AND CHECKOUT, all (SODF: EPS: ACTIVATION AND CHECKOUT: PRIMARY POWER SYSTEM), then:
5. POST MAINTENANCE
 - 5.1 Stow tools.
 - 5.2 Notify **MCC-H** of task completion, P/Ns, S/Ns of installed UOPs.