
FAILURE MODE EFFECTS ANALYSIS/CRITICAL ITEMS LIST

FMEA NUMBER: EC-PORT1-5A ORIGINATOR: JSC PROJECT:EDFT-03

PART NAME: LARGE FLUID LINE	LRU/ORU PART NUMBER: SED39126403-301*	QUANTITY: 1
PART NUMBER: 1F70274	LRU/ORU PART NAME: PIT-PIT UT BOX	SYSTEM: GFE
LSC CONTROL NO: N/A	DRAWING/REF DESIGNATOR: SEE P/N	SUBSYSTEM: EVA
ZONE/LOCATION: PORT 1	EFFECTIVITY/AFFECT STAGE: STS-72	

CRITICALITY:

CRITICAL ITEM: Yes SUCCESS PATHS: 2
 CRITICALITY CATEGORY: 1R/2 SUCCESS PATH REMAINING: 1

END ITEM NAME: N/A
 END ITEM FUNCTIONAL: N/A
 END ITEM CAPABILITY: N/A
 END ITEM FAILURE TOLERANCE: N/A

REDUNDANCY SCREENS:

- A/1. C/O PRELAUNCH: Pass
2. C/O ON ORBIT: N/A for NSTS
- B/3. DETECTION FLIGHT CREW: N/A
4. DETECTION GROUND CREW: N/A
- C/5. LOSS OF REDUNDANCY FROM SINGLE CAUSE: Pass

FUNCTION: Large Fluid line provide the non-functional (no fluid in line) and structural interface to dummy connector receptacles in the primary and secondary boxes. Line is stowed and must be restowed in the ASEM node box for launch and landing.

FAILURE MODE CODE: N/A for NSTS

FAILURE MODE: 1) Unable to demate connector
 CAUSE: Contamination, galling, wear, piece part defect, line stiffness too high.

REMAINING PATHS: 1	EFFECT/ MISSION PHASE:
Contingency release of door	EVA
and tether line in port bay one	

CORRECTIVE ACTION: Ensure line is secured and perform contingency release of door.

-FAILURE EFFECTS-

END ITEM/LRU/ORU/ASSEMBLY: 1) Unable to remove line. Primary PIT to PIT Utility Box door can not be closed.

SUBSYSTEM/NEXT ASSEMBLY/INTERFACE: N/A

SYSTEM/END ITEM/MISSION: None.

CREW/VEHICLE : If all means to remove line are unsuccessful, Primary PIT to PIT Utility Box door must be removed. Possible vehicle damage due to impact caused from structural failure of door during descent /landing.

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HAZARD INFORMATION:

HAZARD: N/A

HAZARD ORGANIZATION CODE: N/A

HAZARD NUMBER: N/A

TIME TO EFFECT: hours

TIME TO DETECT: seconds

TIME TO CORRECT: minutes

REMARKS:

Crew has had difficulty in securing and removing this line during WETF training.

-RATIONALE FOR ACCEPTABILITY-

A) **DESIGN:** Large fluid line connectors mating and demating is driven by a overcenter mechanism. A quick disconnect type locking collar is also incorporated to ensure connector will not inadvertently release.

(B) **TEST:**

Acceptance: Functional performed at predelivery acceptance, preinstallation acceptance, pre/post environmental test, and demonstrated during the thermal/vacuum test.

1) Force required to install and release connectors from receptacles is between 8 lb. and 25 lb.

Qualification:

Protoflight Vibration : A vibration test was performed to the following levels for a duration of 1 minute in each axis:

X AXIS		Y AXIS		Z AXIS	
20 - 30 Hz	+3 db/oct	20 - 45 Hz	+10 db/oct	20 - 45Hz	.009g ² /Hz
80 - 350 Hz	.040g ² /Hz	45 - 600 Hz	.060g ² /Hz	45 -70 Hz	-12 db/oct
350 - 2000 Hz	-3db/oct	600 - 2000	-10db/oct	70 - 600 Hz	.050 g ² /Hz
				600 - 2000Hz	-6 db/oct
6.1 grms		7.7 grms		7.0 grms	

Thermal/Vacuum : Connector operation demonstrated at a temperature of -100°F at a pressure of 1×10^{-5} torr.

(C) **INSPECTION:**

Fabrication - All latch components are verified to generally clean individually. The PIT segment to PIT Segment Utility Box is verified to be visually clean at predelivery acceptance.
 Test - Quality Assurance surveillance is required at all test and inspections. Discrepancy reports are written on all noncompliance's.

(D) **FAILURE HISTORY:** None.

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(E) OPERATIONAL USE:

- 1) **Operational Effect** - Utility Box Door cannot be closed if line remains in box. Release of the door is possible during deorbit/landing. Loose equipment could impact the vehicle.
- 2) **Crew Action** - If connector fails attached, release EVA hinge bolts and door stay and jettison door.
- 3) **Crew Training** - Crew trained in proper operation of connectors and door assy.
- 4) **Mission constraint** - None.
- 5) **In Flight Checkout** - Proper stowage of fluid line verified during EVA operations.

PREPARED BY: G. Wright
REVISION:**DATE :8/10/95****WAIVER NUMBER:**