

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
Common Multiple Connector, Item 410 ----- SV778872-24 (1)	2/2	410FM04A External leakage, coupled, cooling water (there are two couplings: one inlet and one outlet). Failure, coupling O- seal bypass leakage, defective umbilical dynatube line or line fitting leakage.	END ITEM: Water leakage to ambient GFE INTERFACE: Depletion of the vehicle/ station water reservoir. MISSION: Terminate EVA. Unable to use one umbilical during Airlock activity. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - The coupled cooling water supply fittings each have four potential external leakage paths. Two paths are blocked by single static, radial O-seals. The third leakage path contains three radial O-seals which slide axially along sealing surfaces during coupling and uncoupling. A combination of two seals must leak before this leakage path develops. The O-rings seal design configuration and rigidity of assembly provide squeeze under all loading conditions of the elastomeric seals. The fourth leakage path is by a Dynatube fitting joint at the flex hose to SCU connector oxygen elbow. These fittings are required to have a 32 micro-inch maximum circular lap surface finish to preclude leakage. B. Test - Component Acceptance: Air-Lock, Inc. ATP 9902-03 requires that at (IEU) 30 psig / (SCU) 22.5 + 0.5 psig (H2O) "In" Cooling Water, the maximum allowable external leakage is .15 cc/hr. At (IEU) 30 psig / (SCU) 22.5 + 0.5 psig (H2O) "Out" Cooling Water, the maximum allowable external leakage is 0.15 cc/hr. PDA: A leakage test is performed per EMU1-21-022 (IEU) / SEMU-60-015 (SCU). The multiple connector (with cooling lines attached) is mated, and pressurized with water to 28.1 +/- 1.5 psig. Leakage is monitored for 60 minutes minimum. No evidence of external leakage is allowed. Certification: Certified for a useful life of 15 years. C. Inspection - The "O" seals and metal sealing surfaces are 100% inspected by Air-Lock, Inc. for surface characteristics. D. Failure History - None. E. Ground Turnaround - IEU: Tested per FEMU-G-527, cooling water leakage check. SCU: Tested per FEMU-R-001, V1103.02 EMU checkout in Orbiter. F. Operational Use - Crew Response - Pre/Post EVA: Troubleshoot problem. If no success, discontinue use of Umbilical. Operate EMU on battery power. Consider sharing other Umbilical for cooling and O2 if battery constraints permit. Consider in-suit battery swap using spare battery(s). Special Training - Standard EMU training covers this failure mode. Operational Considerations - At least one spare battery is manifested for each flight. Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-410 SCU COMMON MULTIPLE CONNECTOR
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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