NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		410FM09		
COMMON MULTIPLE CONNECTOR, ITEM 410 --- SV778872-24 (1)	2/2	SCU detaches from adapter stowage plate. SCU latch spring failure.	END ITEM: SCU common multiple connector latch spring fractures allowing handle rotation and separation of connector halves. GFE INTERFACE: The SCU connector detaches from stowage plate as a result of launch vibration and may impact surrounding airlock equipment, the EMU or the SCU. MISSION: Loss of use of one EMU. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Hours. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - Positive camming action by the SCU connector lever insures axial displacement of the fluid connection bosses into the stowage plate recesses. The connector lever has a locking feature which locks the handle in the fully latched position, and this handle lock must be disengaged before the connector handle can be rotated to disconnect the SCU connector from the stowage plate. Latching pins at the stowage plates provide a connection interface, identical to the DCM latch shaft. Different boss sizes at the stowage plate prevent upside-down installation of the SCU connector. Springs in the SCU handle latch mechanism are initially stressed beyond the yield point, but after first operation are capable of more than 10,000 cycles without fatigue failure. The springs are made of 302/304 cres per QQ-W-423. Other materials for the SCU connector are 17-4 PH cres condition H1050 per AMS 5643 for the latch handle and A-286 alloy steel per AMS 5737 for the set screws. Difficulty with latch closure caused by loosening of the set screws is alleviated by torquing the set scres 10-12 in-lbs. above running torque. Engineering tests certify that the torque provides preload over operational load. The set screws are installed with locktite to prevent loosening under vibration and cycle loads. B. Test - Certification Test - Certified for a useful life of 20 years. A successful refurbishment will extend useful life to 30 years (Ref. EMUM1-0448). C. Inspection - Failure of the latch spring. An in-process test is performed at HSWL to cycle the engagement and pressurizing of the item 10 times. An in-process test is also performed to check that the item engages properly under a maximum force of 10 lbs while it is pressurized at working conditions. HS source inspection visually inspects umbilical connector, in addition to Airlock final inspection. D. Failure History - None. E. Ground Turnaround - Tested per FEMU-R-001, V1103.02 EMU to Orbiter Checkout. F. Operational Use - Crew Response - Launch and reentry: None possible. Training - No training specifically covers this failure mode. Operational Considerations - 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.

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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

Prepared by: _____
HS - Project Engineering

_____
HS - Reliability

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HS - Engineering Manager

Approved by: _____ 5/21/02
NASA – SSA/SSM
LSS

_____ 5/21/02
NASA – EMU/SSM

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NASA - S & MA

_____ 5-30-02
NASA - MOD

_____ 6/04/02
NASA - Crew

_____ 6/3/02
NASA - Program Manager