NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		391FM17		
JUMPER HARNESS, ITEM 391 ---------- SV821755-1 (1)	2/1R	Electrical open in fan switch line. Cable chafing against connector shell or shield. Improper connector strain relief. Faulty connection between connector and lead wires, conductor severed, contact resistance.	END ITEM: Loss of continuity to Fan (123) electronics. GFE INTERFACE: Loss of power to fan. Loss of vent flow. MISSION: Terminate EVA. CREW/VEHICLE: None for single failure. Possible crew loss with loss of SOP. TIME TO EFFECT /ACTIONS: Seconds. If EVA, open purge valve to activate the SOP and return to vehicle. TIME AVAILABLE: Minutes. TIME REQUIRED: Seconds. REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	A. Design - Open circuits in the item 391 harness are minimized by the following: Each connector/adapter ring interface is locked in place to prevent rotation by mechanical lock. #22 AWG Teflon insulated wires and connector provide elect conduction and insulation properties. Connector pins are operating at 56.7 derated temperature and wire at 4.4% of derated current. The woven Halar sh is assembled over the internal cables to provide protection from abrasion a impact. The P3 connector backshell housing has internal edges blended smoot prevent cable chafing. Strain relief is provided by the combination of convolute tubing, metal EMI braid, and 0.5" extra cable length. The braided items are secured by a band strap at each connector/cable interface. The convolute tubing is threaded into the connectors. Wire crimping is performe SVHS4909 (based on MSFC Spec-Q-1A). B. Test - Component Acceptance Test - The 391 harness is subjected to acceptance testing per AT-E-391 prior to fi acceptance to ensure there are no workmanship problems that could cause an or short circuit. Each connector/harness interface is subjected to a 9-lb. test. The insulation resistance between each conductor and the ground circ is measured during this test to ensure there are no intermittent shorts and verify the integrity of the harness strain relief. A continuity test is performed to measure the resistance of each circuit to ensure there are no circuits or high resistance paths. The insulation resistance and dielectric strength between each conductor and the shield ground is measured to ensure there are no shorts. PDA Test - The fan switch line is checked during DCM PDA testing per SEMU-60-015 para. (Electrical Testing). Certification Test - Certified for a useful life of 15 years (ref. EMU1-13-046). C. Inspection - To ensure that there are no workmanship problems which could cause an open circuit in the harness conductors, the following inspections are made: Cont crimp samples are made prior to start of crimping and at the conclusion of crimping and pull tested to ensure the crimp tooling is operating properly. crimp terminations are inspected for defects. Harness cables and conductor visually inspected prior to assembly to ensure there are no defects which c cause an open due to workmanship. Electrical bond test is performed to ver ground path through various points on the harness. In-process and final electrical checkout of the harness (conductor continuity, dielectric streng and insulation resistance tests) are performed to ensure there are no open/ circuits. D. Failure History - None. E. Ground Turnaround - Tested per FEMU-R-001, Water Servicing, Leakage and Gas Removal. FEMU-R-00 Para. 8.2, EMU Pre-flight KSC Checkout for EET processing.

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F. Operational Use -
Crew Response -
PreEVA/PostEVA: Trouble shoot problem. Consider third EMU if available. If success, EMU go for prep without fan and SCU standby. EVA: When loss of fan occurs, open helmet purge valve and deactivate EMU power. Terminate EVA.

Training - Standard training covers this failure mode.

Operational Considerations -
Flight rule A15.1.2-2 of "Space Shuttle Operational Flight Rules", NSTS-128 defines go/no go criteria related to EMU ventilation flow. 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-391 JUMPER POWER HARNESS

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____
HS - Project Engineering

Approved by: _____ 5/16/02
NASA – ~~SSA~~/SSM
ES5

_____
HS - Reliability

_____ 5/21/02
NASA – EMU/SSM

_____ 4/24/02
HS - Engineering Manager

_____ 5/28/02
NASA - S & MA

_____ 5-30-02
NASA - MOD

_____ 6/04/02
NASA - Crew

_____ 6/3/02
NASA - Program Manager