

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
JUMPER HARNESS, ITEM 392 ----- SV821756-2 (1)	2/2	392FM06 Electrical short in warning tone or status tone lines.  Cable chafing against connector shell or shield. Improper connector strain relief, insulation breakdown.	END ITEM: Short from warning tone or status tone lines to ground.  GFE INTERFACE: Tones will be continuously activated.  MISSION: Terminate EVA due to crew discomfort from continuous tones.  CREW/VEHICLE: None.  TIME TO EFFECT /ACTIONS: Seconds.  TIME AVAILABLE: Minutes.  TIME REQUIRED: Minutes.  REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - Short circuits are minimized by the following: Each connector/adaptor ring interface is locked in place to prevent rotation by a mechanical lock. #24 Teflon insulated wires and connector provide electrical conduction and insulation properties. Connector pins are operating at 56.7% of derated temperature and 1.78% of derated voltage, and the wire is at less than 1% of derated current. The convoluted tubing provides an additional layer of insulation to prevent shorts between the EMI braid and any internal unshielded conductors. The woven Halar sheath is assembled over the internal cables to provide protection from abrasion and impact. Connector pins are insulated by polyphenylene sulfide insert. Strain relief is provided by the combination 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 performed SVHS4909 (based on MSFC Spec-Q-1A).  B. Test - Component Acceptance Test - The 392 harness is subjected to acceptance testing per AT-E-392 prior to final acceptance to ensure there are no workmanship problems that could cause an open or short circuit. Each connector/harness interface is subjected to a 9-lb. test. The insulation resistance between each conductor and the ground circuit 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 open 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 warning tone and status lines are checked during DCM PDA testing per SI 015 para. 4.0 (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 a short circuit in the harness conductors, the following inspections are made: Contact 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 conductors are visually inspected prior to assembly to ensure there are no defects which could cause a short due to workmanship. Electrical bond test is performed to verify ground path through various points on the harness. In-process and final electrical checkout of the harness (conductor continuity, dielectric strength and insulation resistance tests) are performed to ensure there are no open circuits.  D. Failure History - None.  E. Ground Turnaround -

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	392FM06		Ground Turnaround tested per FEMU-R-001, Tones Test.  F. Operational Use - Crew Response - PreEVA: Trouble shoot problem. Consider third EMU if available. Terminate I prep due to crew discomfort caused by continuous tone and loss of EMU annunciation capability. EVA: Terminate EVA. EMU is go for SCU if noise level bearable.  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 CWS. Generic EVA Checklist, JSC-4 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-392 JUMPER SIGNAL HARNESS  
CRITICAL ITEM LIST (CIL)  
EMU CONTRACT NO. NAS 9-97150

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