


NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
JUMPER HARNESS, ITEM 391 ----- SV821755-1 (1)	3/1RAB	391FM07 Electrical open, (+) battery line.  Cable chafing against connector shell or shield. Improper connector strain relief. Faulty connection between the connector and the lead wires, conductor severed, contact resistance.	END ITEM: Loss of continuity in one of two redundant battery (+) lines.  GFE INTERFACE: Loss of one of two redundant battery (+) lines. Slight increase (0.05 ohm) in path resistance.  MISSION: None for single failure. Terminate EVA with loss of second line (loss of fan).  CREW/VEHICLE: None for single or double failure. Possible loss of crewman with loss of SOP.  TIME TO EFFECT /ACTIONS: Seconds.  TIME AVAILABLE: Minutes.  TIME REQUIRED: Seconds.  REDUNDANCY SCREENS:	A. Design - Open circuits are minimized by the following: Each connector/adaptor ring interface is locked in place to prevent rotation by a mechanical lock. #22 Teflon insulated wires and connector provide electrical conduction and insulation properties. Connector pins are operating at 56.7% of derated temperature and wire at 77.6% of derated current. The woven Halar sheath is assembled over the internal cables to provide protection from abrasion and impact. The P3 connector backshell housing has internal edges blended smooth to prevent cable chafing. Strain relief is provided by the combination of conv 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 tube is threaded into the connectors. Wire crimping is performed per SVHS4909 (1 on MSFC Spec-Q-1A).  B. Test - Component Acceptance Test - The 391 harness is subjected to acceptance testing per AT-E-391 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 to 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 (+) battery lines are checked during DCM PDA testing per SEMU-60-015 paragraph 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 an open 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 an open 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 - None, this failure mode can not be detected during normal ground turnaround testing because of the redundant design of the (+) battery line.

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		391FM07	A-FAIL B-FAIL C-PASS	F. Operational Use - Crew Response - PreEVA/EVA: No response, single failure undetectable by crew or ground.  Training - No training specifically covers this failure mode.  Operational Considerations - Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 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

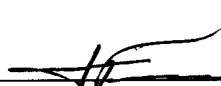
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NASA - SSA/SSM  
LSS

  
HS - Reliability

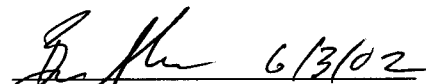
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