

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
JUMPER HARNESS, ITEM 391 ----- SV821755-1 (1)	2/2	391FM11  Electrical open or short in coolant loop isolation valve (CLIV) open/ close lines.  Cable chafing against connector shell or shield. Improper connector strain relief. Faulty connection between connector and lead wires, insulation breakdown, conductor severed, contact resistance.	END ITEM: Electrical open or short to ground in CLIV open/close lines. These lines are current limited to 0.7 +/- 0.2 amps in the DCM.  GFE INTERFACE: Loss of power to CLIV. Unable to change position of Item 171 valve. Loss of cooling loop degas capability. May not be able to start pump with valve closed.  MISSION: Terminate EVA with crew discomfort, (hot).  CREW/VEHICLE: None.  TIME TO EFFECT /ACTIONS: Minutes.  TIME AVAILABLE: N/A  TIME REQUIRED: N/A	A. Design - Open and short circuits are minimized by the following: Each connector/adaptor ring interface is locked in place to prevent rotation by a mechanical lock. #22 AWG Teflon insulated wires and connector provide electrical conduction and insulation properties. Connector pins are at 56.7% of derated temperature and 6.9% of derated voltage, and wire is at 12.4% 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 a polyphenylene sulfide insert. The P3 connector backshell housing has internal edges blended smooth to 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 performed per 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 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. pull 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 - An open or short in the CLIV open/close lines would be detected during DCM PDA testing per SEMU-60-015 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 an open or 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. All 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 or 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/short circuits.  D. Failure History - None.

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		391FM11	REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	E. Ground Turnaround - Tested per FEMU-R-001, Dry LCVG Degas Test.  F. Operational Use - Crew Response - PreEVA: Troubleshoot problem. If no success, consider third EMU if available. Otherwise, EMU is go for SCU. EVA: Terminate EVA.  Training - Standard training covers this failure mode.  Operational Considerations - Flight rule A15.1.2-2 of "Space Shuttle Operational Flight Rules", NSTS-12820 defines go/no go criteria related to EMU thermal control. 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-106 GLOVE ASSEMBLY  
CRITICAL ITEM LIST (CIL)

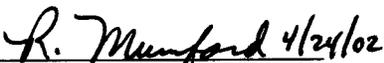
EMU CONTRACT NO. NAS 9-97150

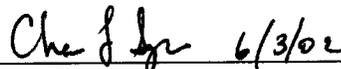
Prepared by:   
HS - Project Engineering

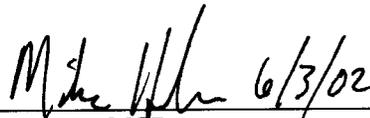
Approved by:  22mar02  
NASA - SSA/SSM

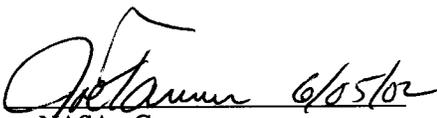
  
HS - Reliability

 5/23/02  
NASA - EMU/SSM

 4/24/02  
HS - Engineering Manager

 6/3/02  
NASA - S & MA

 6/3/02  
NASA - MOD

 6/5/02  
NASA - Crew

 6/3/02  
NASA - Program Manager