

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
JUMPER HARNESS, ITEM 392 ----- SV821756-2 (1)	2/1R	392FM04 Electrical short or open in discrete lines from DCM to CWS.  Cable chafing against connector shell or shield. Improper connector strain relief. Faulty connection between the connector and the lead wires, insulation breakdown, conductor severed, contact resistance.	END ITEM: No signal to CWS for the state of eight discrete signals. Battery power on, feedwater valve on, fan on, O2 actuator positions.  GFE INTERFACE: CWS would get erroneous discrete signal and possible erroneous warning message.  MISSION: None for first failure.  CREW/VEHICLE: None for single failure. Fan switch discrete is worst case effect. Possible crew loss for a second failure (low vent flow) because crew would not be alerted to CO2 buildup in helmet.  TIME TO EFFECT /ACTIONS: Seconds.	A. Design - Open and short circuits are minimized by the following: Each connector/adapt ring interface is locked in place to prevent rotation by a mechanical lock. AWG Teflon insulated wires and connector provide electrical conduction and insulation properties. Connector pins are operating at 56.7% of derate temperature and 4.68% derated voltage, and wire is at less than 1% of derate current. The convoluted tubing provides an additional layer of insulation t prevent shorts between the EMI braid and any internal unshielded conductors woven Halar sheath is assembled over the internal cables to provide protect from abrasion and impact. Connector pins are insulated by a polyphenylene sulfide insert. Strain relief is provided by the combination of convolute tubing, metal EMI braid , and 0.5" extra cable length. The braided items ar secured by a band strap at each connector/cable interface. The convolute tu is threaded into the connectors. Wire crimping is performed per SVHS4909 (I on MSFC Spec-Q-1A).  B. Test - Component Acceptance Test - The 392 harness is subjected to acceptance testing per AT-E-392 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 discrete signal lines are checked during DCM PDA testing per SEMU-60-01 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 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 oper properly. All crimp terminations are inspected for defects. Harness cables conductors are visually inspected prior to assembly to ensure there are no defects which could cause an open or short due to workmanship. Electrical I test is performed to verify ground path through various points on the harne In-process and final electrical checkout of the harness (conductor continuity,dielectric strength,and insulation resistance tests) are perform ensure there are no open/short circuits.  D. Failure History - None.  E. Ground Turnaround -

NAME P/N QTY	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
	392FM04		
		TIME REQUIRED: Minutes.	Tested per FEMU-R-001, Transducer and DCM Gauge Calibration Check. FEMU-R-Para. 8.2, EMU Pre-flight KSC Checkout for EET processing.
		REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	F. Operational Use - Crew Response -PreEVA: Trouble shoot problem, consider third EMU if available If status list valid, EMU is go for EVA, otherwise terminate EVA prep. EVA status list valid, EMU is go to continue EVA.  Training - EV crew is trained to recognize the symptoms of high C02.  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

Prepared by: *J. Aman, Jr.*  
HS - Project Engineering

Approved by: *RMB* *[Signature]* 5/21/02  
NASA - SSA/SSM  
LSS

*M. Snyder*  
HS - Reliability

*NAB/arcw* 5/24/02  
NASA - EMU/SSM

*R. Mumford* 4/24/02  
HS - Engineering Manager

*[Signature]* 5/29/02  
NASA - S & MA

*Paul S. Baker* 5-30-02  
NASA - MOD

*Joe Tannen* 6/04/02  
NASA - Crew

*[Signature]* 6/3/02  
NASA - Program Manager