

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
ELECTRICAL POWER HARNESS, ITEM 151 S47B9151-4 (1)	2/2	IS1FN16: Electrical short to ground in VOK disable line. CAUSE: Cable chaffing against connector shell or shield, Improper connector strain relief.	END ITEM: Electrical short to ground in VOK disable line. OPE INTERFACE: Remains in VOK disable (REC) mode of operation, Cannot transmit, Only receive. MISSION: Terminates EVA. CREW/VEHICLE: None.	A. Design - Short circuits in any of the circuits in the the Item 151 harness are minimized by the following: Conductors are hard potted in Stycast 2651 in the area that they interface with the metal backshells to minimize their movement and chance of shorting to the backshell. The conductors are strain relieved at the connector/harness interface with a welded rubber backshell. This minimizes the effects of cable tension on the individual conductors. Conductors are sheathed within a woven Nomex outer layer. This holds the cables together to share any loading. Each connector/ adapter ring interface is locked in place to prevent rotation by a mechanical and adhesive lock. #22 and #24 AWG teflon insulated wires which are crimped per SVHS4909, Class 1, provide electrical and mechanical properties to prevent wire breakage and to help prevent shorting. B. Test - Component Acceptance Test - The harness is acceptance tested per the following tests of AI-EMU-151 to insure there are no workmanship problems which would cause actual or potential short circuits. Pull Test - This test subjects each connector/harness interface to a specific pull test (9 pounds) designed to exceed any stress encountered in actual use. The insulation resistance between each conductor and the ground circuit is measured during the test to insure there is no shorting. Insulation Resistance/Dielectric Strength Test - The harness is tested for short circuits or low resistance paths between each conductor to each other conductor by insulation resistance and dielectric strength measurements at 200 VDC and 200 VAC respectively. PPA Test - A short circuit in the P31 Communication lines would be detected during the portion of PLSS PPA testing per SEMU-60-010. Certification Test - This item has completed the 15 year structural vibration and shock certification requirements during 10/83. EC's 42806-527-2 (insulation resistance check during Pull Test) and 42806-865 (busswire crimp splices) have been incorporated

HAUC P/N DTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
	2/2	151FH18z		and certified since this configuration was certified.

C. Inspection -

During harness manufacturing the following inspections are performed:
 Visual inspection of conductors prior to potting operations to insure there are no damaged conductors and that the conductors are routed properly.
 Visual inspection of the harness prior to and after rubber boot molding process to insure there are no damaged conductors which could cause an open circuit.
 In-process electrical checkout of the harness before and after potting and molding to insure there are no short circuits.
 Visual inspection of the conductors prior to application of the outer sheath to insure there are no damaged conductors that could cause a short circuit.
 Connector contact crimp samples are made prior to and after crimping and subjected to pull testing to insure the crimping tools are operating properly. This insures there will not be any high resistance problems at the contacts.

D. Failure History -

The following NDR's were issued for the item 151 due to open circuit:
 H-EMU-151-0001 (7-8-83) Intermittent open due to a broken wire at the P12 connector during acceptance testing. This failure was caused by a workmanship problem. The corrective action taken was to add a visual inspection prior to molding.
 H-EMU-151-0002 (12-14-83) Intermittent open due to a broken wire at the P3 connector during acceptance testing due to a workmanship problem. The corrective action taken was to issue EC 42806-527 which fixes the angular location of the P3 adapter ring slot to insure proper wire exit and EC 42806-527-2 which requires that a pull test be performed to detect opens or shorts.

E. Ground Turnaround -

Tested per FEMU-R-001, SEMU Pre-flight Communications and Blowed Check.

CIL
EMU CRITICAL ITEMS LIST

12/24/91 SUPERSEDES 01/02/90

ANALYST:

Page: 3
Date: 12/02/91

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	2/2	IS (#1163)		<p>F. Operational Use - Crew Response - PreEVA/PostEVA: trouble shoot problem, consider third EMU if available, if no success, EMU go for SCU standby. EVA: when loss of fan, comm and CDS data occurs, open helmet purge valve and deactivate EMU power. Terminate EVA. Training - Standard training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems. Flight rules define go/no go criteria related to EMU battery power.</p>