

April 5, 1986

CIL
CRITICAL ITEMS LIST
FILE: CIL771

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
Electrical Power Harness Item 151 SN789151-4 (1)	2/1Rb	1B1FM02: Electrical open, warning tone or status tone line.	END ITEM: Loss of signal in warning tone or status tone line. GPE INTERFACE: No audible tones when activated by CWS. MISSION: Crewman would not be alerted to subsequent failures and could not properly respond with corrective action. Loss of use of one EMU. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of ECC, oxygen, or low vent flow.	A. Design - Open circuits in any of the circuits in the Item 151 harness are minimized by the following: Conductors are hand potted in Stycast 2551 in the area that they interlace the metal backshell to minimize trim movement and chance of shorting to the backshell. The conductors are strain relieved at the connector/harness interface with a molded 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. #22 and #24 AWG Teflon jacketed wires provide mechanical strength which help prevent breakage. Each connector/adaptor ring interface is locked in place to prevent rotation by a combined mechanical and adhesive lock. Crimping is per SVSH4809 (based on MSFC-Spec-Q-1A). B. Test - Component Acceptance Test - The harness is acceptance tested per the following tests of AT-EMU-151 to ensure there are no workmanship problems which would cause actual or potential open 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 ensure there is no shorting. The test is followed by a continuity check of each conductor path to ensure there are no open circuits. Continuity Test - The resistance of each circuit is measured to ensure there are no open circuits or high resistance paths. PDA Test - The warning tone and status tone lines are checked during the Communication Interface portion of PLSS PDA testing per para. 5.0 of SEMU-60-010. Certification Test - This item has completed the 15 year structural vibration and shock certification requirements during 10/83. Engineering Changes 42806-527-2 (insulation resistance check during Pull Test) and 42806-865 (remove crimp splices) have been incorporated and certified by test since this configuration was certified.
LB21-1 **		CAUSE: Cable chafing against connector shell or shield. Improper connector strain relief. Faulty connection between the connector and the lead wires.		

April 5, 1988

CIL
CRITICAL ITEMS LIST
FILE: CIL7/1

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
Electrical Power Harness Item 151 5v709161-4 (1)	2/IRb	151FMD2: Electrical open, warning tone or status tone line.		<p>C. Inspection - During harness manufacturing, the following inspections are performed to ensure there are no open circuits.</p> <p>a. Visual inspection of conductors prior to potting operations to ensure there are no damaged conductors and that the conductors are routed properly.</p> <p>b. Visual inspection of the harness prior to and after rubber boot molding process to ensure there are no damaged conductors which could cause an open circuit.</p> <p>c. In-process electrical checkout of the harness before and after potting and molding to ensure there are no open circuits.</p> <p>d. Visual inspection of the conductors prior to application of the outer sheath to ensure there are no damaged conductors that could cause an open circuit.</p> <p>e. Connector contact crimp samples are made prior to and after crimping and subjected to pull testing to ensure the crimping tools are operating properly. This ensures there will not be any high resistance problems at the contacts.</p> <p>D. Failure History - The following RDR's were issued for Item 151 due to open circuits.</p> <p>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 was to add a visual inspection prior to molding.</p> <p>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.</p> <p>E. Ground Turnaround - Tested per FEMU-R-001, Tones Test.</p> <p>F. Operational Use - Crew Response - PreEVA: Trouble shoot if no success, consider third EMU if available. Otherwise, EMU go for EVA. Rely on visual monitoring of displayed messages. EVA: If detected during airlock depress, continue EVA. Rely on visual monitoring of displayed messages. Training - Standard EMU training covers this failure mode. Operational Considerations - Reference Loss/Failure Flight Rules: Define EMU as lost if crew and ground determine insufficient CWS data is available. EVA checklist and FDB procedures verify hardware integrity and systems operational status prior to EVA. EMU CWS provides readout on EMU status. Real Time Data System allows ground monitoring of EMU systems.</p>