

April 5, 1988

CIL
CRITICAL ITEMS LIST
FILE: CIL771

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
Electrical Power Harness Item 151 SV7B9151-4 (1)	2/2	151FM03: Electrical short to ground in warning tone or status tone lines.	END ITEM: Electrical short in warning tone or status tone lines to ground.	A. Design - Short circuits in any of the circuits in the Item 151 harness is minimized by the following: Conductors are hand potted in Stycast 2651 in the area that they interface 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 molded rubber backshell. This minimizes the effects of cable tension on the individual conductors. Conductors are sheathed within a woven Kevlar outer layer. This holds the cables together to share any loading. #22 and #24 AWG Teflon jacketed wires provide electrical and mechanical properties which help prevent breakage. Each connector/adaptor ring interface is locked in place to prevent rotation by a combined mechanical and adhesive lock.
B152-1 /		CAUSE: Cable chafing against connector shell or shield. Improper connector strain relief.	QFE INTERFACE: Tones will be continuously activated. MISSION: Terminate EVA due to crew discomfort and loss of tones of future warning messages. CREW/VEHICLE: None.	B. Test - Component Acceptance: The harness is acceptance tested per the following tests of AT-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. The test is followed by a continuity check of each conductor path to insure there are no open circuits. PDA: The warning tone and status tone lines are checked during Communications Interface portion of PLSS PDA testing per par. 5.0 of SEMU-60-010. Certification: This item has completed the 15 year structural vibration and shock certification requirements during 10/83. Engineering Changes 42B06-527-2 (insulation resistance check during Pull Test) and 42B06-865 (remove crimp splices) have been incorporated and certified by test since this configuration was certified.

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 SV789151-4 (1)	2/2	151FW03: Electrical short to ground in warning tone or status tone lines.		<p>C. Inspection - During harness manufacturing, the following inspections are performed to insure there are no short circuits. 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 a short 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.</p> <p>D. Failure History - The following RDR's were issued for Item 151 due to short circuits: J-EMU-151-003 (8-27-84) the harness failed dielectric Acceptance testing. Investigation determined the cause of the failure to be an intermittent short circuit between the warning tone line and the P9 connector body. This was due to improper strain relief of the wire which allowed it to come in contact with the connector adapter ring. The wire insulation was broken when the rubber backshell was molded to the connector. Class I EC 42806-527-2 created the SV789151-3 harness configuration by adding a connector pull test requirement to the acceptance test requirements. Class I EC 42806-865 created the SV789151-4 harness configuration by eliminating the two splices in the P9 connector to prevent them from shorting to case. H-EMU-151-004 (8/12/85) and J-EMU-151-005 (6-12-85) Both failures occurred during an ETA Airtack Power Supply functional test. The failures were caused by a short circuit between the EVC power/battery sense (+) line and case ground (connector body). The failure caused the suit return line in the DCW to Fuse open. The failure investigation found that a crimp splice within the molded backshell was not sufficiently covered by shrink tubing. The exposed portion of the crimp was allowed to come in contact with the connector body.</p> <p>E. Ground Turnaround - Ground turnaround tested per FEMU-R-001, ToneX Test.</p>
B152-2 F				

April 5, 1988

C14
CRITICAL ITEMS LIST
FILE: C147/1

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
Electrical Power Harness Item 151 SV789151-4 (1)	2/2	151FWD3: Electrical short at ground in warning tone or status tone lines.		F. Operational Use - Crew Response - PreEVA: Trouble shoot problem. Consider third EMU if available. Terminate EVA prep due to crew discomfort caused by continuous tone and loss of EMU annunciation capability. EVA: Terminate EVA. EMU is go for SCU if noise level is bearable. Training - Standard training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and system operational status prior to EVA. Flight rules define go/no go criteria related to EMU CNS. Real Time Data System allows ground monitoring of EMU Systems.
B152-3 A				