

12/24/94 SUPERSEDES 12/24/91

ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
EMU ELECTRICAL HARNESS, ITEM 440 ----- SV767690-02 (1)	3/2RB	440FN06: Electrical open or short, microphone power lines. CAUSE: Cable chafing against connector shell or shield. Improper connector strain relief. Faulty connection between the connector and the lead wires.	END ITEM: Open circuit or short to ground in microphone power lines. OFE INTERFACE: Loss of use of one of two microphones. MISSION: None for single failure. Terminate EVA with loss of second microphone power line. CREW/VEHICLE: None.	A. Design - The CCA and ECG connector cable interface is strain relieved by potting the conductors in place. A molded rubber boot is assembled over the connector cable interface to improve strain relief. #24, teflon coated wire prevents wire fatigue and provides insulation resistance. Crimping per SV5K4909 (based on MSFC-Spec-Q-1A). The harness has a Nomex sheath to prevent chafing. B. Test - Component Acceptance Test - The 440 harness is subjected to acceptance testing prior to final acceptance testing. This testing includes the following tests which insure there are no workmanship problems which could cause an electrical short to ground or an open circuit in the microphone lines. The insulation resistance and dielectric strength between each conductor and the shielded ground is measured to insure there are no short circuits. Continuity testing of each conductor is performed to insure there are no open circuits. Certification Test - This item completed the structural vibration and shock certification requirements during 10/83. EC 42806-212-1 (padded connector interface check) has been incorporated and certified since this configuration was certified. This EC was issued to help prevent delivery of improper latching clips and springs. Field units were inspected via 81-EMU-252 to insure proper latching. C. Inspection - To insure there are no workmanship problems which could cause a short or open circuit in the harness conductors, the following inspections are performed: a. Harness cables and conductors are visually inspected prior to assembly to insure there are no defects which could cause a short to ground or an open circuit due to defects in the cable insulation. b. Connector wiring is inspected before and after potting to insure there is no conductor damage and that the conductors are properly strain relieved and properly dressed to prevent conductor shorting to the adapter ring or an open circuit. c. Insulation resistance and dielectric strength are

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	3/288	440FM06;		<p>measured between each conductor and shield ground to insure there are no shorts prior to and after potting of the connectors.</p> <p>d. Contact crimp samples are made prior to the start of contact crimping and at the conclusion of crimping and subjected to a pull test to insure the crimping tools are operating properly. This insures there will not be any high resistance problems at the conductor.</p> <p>D. Failure History - RDR H-EMU-440-CB02 (7-30-86) During EEH connector mate/demate cert cycle testing the shielding to the J10 connector was intermittently open after completing 1000 cycles. This failure was caused by a stiffening of the harness at the J10 connector from Stycast that wicked up the cables during assembly. This reduced the effectiveness of the cable strain relief and made the cable/shield susceptible to breakage when bent at J10 connector strain relief.</p> <p>EC163402-5 redesigns the connector to eliminate Epoxy wicking by incorporating an all rubber strain relief boot.</p> <p>B-EMU-440-A001 (1/11/94) - EMU electrical harness exhibited an intermittent open from RHF connector pin 4 to EEA pin 3 due to a faulty test box connector with retracted connector pins. The test box connector was replaced and the harness passed test.</p> <p>E. Ground Turnaround - Tested per FEMU-R-001, BEMU Communications Check.</p> <p>F. Operational Use - Crew Response - PreEVA/EVA: Continue, second microphone power line is redundant path. Training - Standard EMU training covers this failure mode. Operational Considerations - Reference Loss/Failure flight rules: defines EMU communications requirements for go status. EVA checklist and</p>

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	3/200	440FHD61		FDf procedures verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.