CIL
CRITICAL ITEMS LIST
FILE: CIL7/1

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
ELECTRICAL SIGNALS HARNESS ITEM 152 SV789152-2 (1) 1820-1 **	2/1RB	152FM01: ELECTRICAL SHORT: +5V, +18V, -14.2V OR -14.2V LINE TO GROUND. CAUSE: CABLE CHAFING AGAINST CONNECTOR SHELL OR SHIELD. IMPROPER CONNECTOR STRAIN RELIEF.	END ITEM: SHORT FROM +5V, +18V, -14.2V OR +14.2V LINE TO GROUND. LOSS OF POWER. GFE INTERFACE: INCREASE IN BATTERY POWER CONSUMPTION. THE CURRENT IS LIMITED IN THE PLM DC/DC CONVERTER TO 1.0 +/- 0.25 AMPS. SHUTDOWN OF THE DC/DC CONVERTER. LOSS OF CWS, TONES AND DCM DISPLAY. MISSION: NONE FOR SINGLE FAILURE. TERMINATE EVA WITH LOSS OF DCM DISPLAY, CWS AND ABILITY TO MONITOR OPERATIONAL INTEGRITY OF EMU. LOSS OF USE OF ONE EMU. CREW/VEHICLE: NONE FOR SINGLE FAILURE. POSSIBLE LOSS OF CREWMAN WITH LOSS OF CCC, OXYGEN OR LOW VENT FLOW.	A. DESIGN - EACH CONNECTOR/CABLE INTERFACE IS STRAIN RELIEVED BY POTTING THE CONNECTOR IN PLACE. A RUBBER BACKSHELL IS THEN MOLDED OVER THE CONNECTOR/CABLE INTERFACE. EACH CONNECTOR/ADAPTER RING INTERFACE IS LOCKED IN PLACE TO PREVENT ROTATION BY A MECHANICAL LOCK AND AN ADHESIVE LOCK. #24 AND TEFLON COATED WIRE PROVIDES THE REQUIRED INSULATION RESISTANCE. THE CONDUCTORS ARE BUNDLED WITHIN A WOVEN COPPER STRANDED SHEATH WHICH CAUSES THEM TO ACT TOGETHER AND SHARE ANY LOADING PLACED ON THEM. A WOVEN NOMEX SHEATH IS ASSEMBLED OVER THE SHIELD CABLE BUNDLES TO PROVIDE PROTECTION FROM ABRASION AND IMPACT. B. TEST - COMPONENT ACCEPTANCE TEST - THE 152 HARNESS IS SUBJECTED TO ACCEPTANCE TESTING PER AP-EMU-152 PRIOR TO FINAL ACCEPTANCE TESTING. THIS TESTING INCLUDES THE FOLLOWING TESTS WHICH ENSURE THERE ARE NO WORKMANSHIP PROBLEMS WHICH WOULD CAUSE AN ELECTRICAL SHORT IN THE +5V, +18V AND +14.2V LINES. THE INSULATION RESISTANCE AND DIELECTRIC STRENGTH BETWEEN EACH CONDUCTOR AND THE SHIELD GROUND IS MEASURED TO ENSURE THERE ARE NO SHORTS. EACH CONNECTOR/CABLE INTERFACE IS PULL TESTED (10 POUNDS) TO DETECT ANY WORKMANSHIP PROBLEMS WHICH COULD CAUSE A SHORT CIRCUIT. PDA TEST - THE +5V, +18V AND +14.2V LINES ARE FUNCTIONALLY CHECKED DURING PLSS PDA TESTING PER SEMU-60-010, PARA 35.4, TO INSURE THERE ARE NO SHORTS TO SHIELD GROUND WHICH AFFECT THE PERFORMANCE OF THE PLSS. CERTIFICATION TEST - THIS ITEM HAS COMPLETED THE STRUCTURAL VIBRATION AND SHOCK CERTIFICATION REQUIREMENTS DURING 10/83. ENGINEERING CHANGE 47004-527-2 (ADDED A CONNECTOR PULL TEST) HAS BEEN INCORPORATED AND CERTIFIED SINCE THIS CONFIGURATION WAS CERTIFIED.

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ELECTRICAL SIGNALS HARNESS ITEM 152 SV789152-2 (1) 1024-2 NA	2/1RB	152FM03: ELECTRICAL SHORT, +5V, +10V, -14.2V OR +14.2V LINE TO GROUND.		C. INSPECTION - TO ENSURE THERE ARE NO WORKMANSHIP PROBLEMS WHICH WOULD CAUSE A SHORT CIRCUIT IN THE HARNESS CONDUCTORS, THE FOLLOWING INSPECTIONS ARE PERFORMED: HARNESS CABLES AND CONDUCTORS ARE VISUALLY INSPECTED PRIOR TO ASSEMBLY TO ENSURE THERE ARE NO DEFECTS WHICH WOULD CAUSE A SHORT TO GROUND DUE TO DEFECTS IN THE CABLE INSULATION. CONNECTOR WIRING IS INSPECTED BEFORE AND AFTER POTTING TO ENSURE THERE IS NO CONDUCTOR DAMAGE AND THAT THE CONDUCTORS ARE PROPERLY STRAIN RELIEVED AND PROPERLY DRESSED TO PREVENT CONDUCTOR SHORTING TO THE ADAPTER BEND. INSULATION RESISTANCE AND DIELECTRIC STRENGTH ARE MEASURED BETWEEN EACH CONDUCTOR AND SHIELD GROUND TO ENSURE THERE ARE NO SHORTS PRIOR TO AND AFTER POTTING OF THE CONNECTORS. IN-PROCESS ELECTRICAL CHECKOUT OF THE HARNESS BEFORE AND AFTER POTTING AND MOLDING TO ENSURE THERE ARE NO SHORT CIRCUITS. D. FAILURE HISTORY - H-EMU-152-A001 (7/9/84) DURING PLSS ACCEPTANCE TESTING, ALL SENSOR OUTPUTS READ FULL SCALE. A SHORT CIRCUIT IN THE HARNESS WAS FOUND BETWEEN VREF AND GROUND. THE SHORT WAS DUE TO IMPROPER ASSEMBLY AND TESTING BY THE VENDOR. THE VENDOR'S ASSEMBLY AND TEST PROCEDURES WERE REVISED. RELATED FAILURE: J-EMU-152-002 (4--11-85) - DURING A PRE-FLIGHT COMMUNICATIONS CHECK, IT WAS NOT POSSIBLE TO TRANSMIT THROUGH THE RIGHT MICROPHONE ON THE CCA. THE FAILURE WAS CAUSED BY A SHORT CIRCUIT BETWEEN THE RIGHT MICROPHONE POWER LINE AND THE CABLE GROUNDING SHIELD. THE INSULATION ON THE POWER LINE HAD BEEN DAMAGED PRIOR TO THE CABLE ASSEMBLY. EC 42004-527-2 WAS ISSUED TO CREATE THE SV789152-2 HARNESS CONFIGURATION BY ADDING A CONNECTOR PULL TEST TO THE ACCEPTANCE TESTING REQUIREMENTS. FIELD UNITS WERE TESTED TO THE SAME PROCEDURES PULL AND IR MEASUREMENTS PER SI-EMU-300. E. GROUND TURNAROUND - GROUND TURNAROUND TESTED PER SEMU-R-001, DCM DISPLAY.

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ELECTRICAL SIGNALS HARNESS ITEM 152 SV789152-2 (1)	R/IRD	ISSPHI: ELECTRICAL SHORT, +5V, +18V, -14.2V OR +84.2V LINE TO GROUND.		F. OPERATION USE CREW RESPONSE PRE-EVA : TROUBLE SHOOT, IF NO SUCCESS CONSIDER SWING EMU IF AVAILABLE. OTHERWISE, EMU IS NO-GO FOR EVA. EVA : TERMINATE EVA WHEN DETECTED BY GROUND OR DURING CREWMEMBER'S STATUS CHECK. POST-EVA: N/A TRAINING STANDARD EMU TRAINING COVERS THIS FAILURE MODE. OPERATIONAL CONSIDERATIONS REFERENCE LOSS/FAILURE FLIGHT RULES: DEFINE EIU AS LOST IF CREW AND GROUND DETERMINE INSUFFICIENT EMS DATA AVAILABLE. EVA CHECKLIST AND FDF PROCEDURES VERIFY HARDWARE INTEGRITY AND SYSTEMS OPERATIONAL STATUS PRIOR TO EVA. REAL TIME DATA SYSTEM ALLOWS GROUND MONITORING OF EMU SYSTEMS.

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