

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
COMMON MULTIPLE CONNECTOR, ITEM 330 ----- SV778872-26 (1)	2/2	330FM12 Fails to close, battery recharge line switch. Fracture, switch contact linkage mechanism or diaphragm.	END ITEM: Unable to recharge battery. GFE INTERFACE: Unable to recharge battery. MISSION: Terminate EVA. Loss of use of one EMU. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - As the SCU and DCM connectors are drawn together the SCU half plunger contacts the DCM half battery recharge line switch. Both the plunger and the switch stroke against their springs maintaining a force equilibrium as the connector halves are drawn together. When the battery recharge line switch contacts its stop, its motion ceases and thus further engagement of connector halves causes the plunger to continue to retract against its spring. This design feature prevents overloading and overstroking of the switch mechanism. The switch terminals are recessed within the Multiple connector housing to protect lead wire connections from damage. The position of the switch relative to the Multiple Connector face is controlled so that it is not damaged when the SCU half is mated to it and to insure that switch actuation is achieved. The switch is hermetically sealed to prevent environmental damage to the switch circuit. The switch is threaded into the Multiple Connector housing and locked in place with epoxy to prevent it from loosening and not mating properly with the SCU half. Lead wire connections to the switch are soldered per NNB5300.4 (A3-1) to insure reliability. B. Test - Component Acceptance Test - A continuity test is performed per AT-E-385. The Multiple Connector is mated to close the Battery Recharge Line Switch. The resistance of the Battery Recharge Line must not exceed 0.250 ohm. PDA Test - A continuity test is performed per SEMU-60-015. The battery recharge line resistance must be less than 1.0 ohm, when the multiple connector is mated. Certification Test - Certified for a useful life of 15 years. C. Inspection - Airlock Inc., visually inspects the DCM half at final inspection. H.S. Source inspection visually inspects the DCM half at final inspection. D. Failure History - K-EMU-100-001 (11-21-85) documents a "Unable to perform battery recharge" condition. The failure was caused by the fracture of the CAM switch diaphragm around the actuator button. Without the button present, the SCU half plunger would not actuate the switch. The most probable cause of this failure is handling damage, specifically an unspecified excessive force perpendicular to the direction of use. Corrective Action: HS/WL Test procedures (AT-E-385 and AT-E-300-2) have been updated the addition of an SCU simulator tool to actuate the CAM switch during testing. The preflight inspection procedure EMU-012 has been updated per P.D. 40-87 to include an inspection step (sequence 3.18) to visually verify the CAM switch is attached to the DCM. Also during ETA chamber testing a battery recharge capability test is performed which verifies CAM switch is attached. B-EMU-300-F001 (4/7/91) - Upon completion of the first EVA of STS-37, the battery on EMU #1 could not be recharged by the Airlock Power Supply (ALPS). There are two probable causes:

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		330FM12		<p>1) The power mode selector switch (Item 364) could have had an intermittent high contact resistance in the battery-to-ALPS recharge switch, creating a voltage drop downstream of the battery voltage sense point, indicating high battery voltage (22V) and shutting off the ALPS battery charger. No Corrective Action taken.</p> <p>2) Under worst case DCM/SCU cam switch interface tolerance conditions, the SCU plunger tip might not actuate the DCM switch during SCU Multiple Connector engagement with DCM. The plunger tip will be extended to ensure cam switch actuation under worst case tolerance conditions.</p> <p>E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, V1103.02 Orbiter Checkout. FEMU-R-001 Para 8.2 EMU Preflight KSC Checkout for EET processing.</p> <p>F. Operational Use - Crew Response - Pre/PostEVA: Troubleshoot problem, if no success, consider third EMU if available. EMU no go for EVA.</p> <p>Training - Standard EMU training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define go/no go criteria related to battery power.</p>

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-330 COMMON MULTIPLE CONNECTOR
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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