

CIL
 ENU CRITICAL ITEMS LIST

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12/24/94 SUPERSEDES 12/24/92

ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
POWER MODE SELECTOR SWITCH, ITEM 364 ----- SV778596-4 (1)	2/1R	364FH181 Electrical short from battery power to ground. (12/15/19) CAUSE: Contamination, wire chaffing.	END ITEM: Establishes a low resistance path between battery and ground. GFE INTERFACE: Excessive battery current draw, Failure would cause fusing of P.C. board trace in BCM return line. Unable to power ENU from SCU or battery. Loss of OMS, tones, display, fan, etc. MISSION: Loss of the use of one ENU. Terminate EVA. CREW/VEHICLE: None for single failure. Possible crew loss with loss of SCP.	A. Design - Each of the three switches is seated in a dry nitrogen filled hermetically sealed case. The switches are per MIL-S-8805/46 except that the 10 amp contacts are silver plated. Switch contacts rated for 10 amperes. Actual current flow is 3.8 amperes. The ball socket of the toggle pivot is greased (Breycoote 601) prior to assembly. B. Test - Component Acceptance Test - Switch operation and continuity are verified during vendor acceptance tests. The switch is also subjected to 500 run-in cycles and an axial pull test on the handle to verify that it will not come loose during normal use. In-Process Test - Operation and integrity of the switch are verified during four separate in-process tests during initial item 350 assembly. These tests include continuity and output voltage. The switch is cycled during these tests. PDA Test - The switch is subjected to Acceptance/PDA testing as part of item 350. Tests include continuity, operating torque, vibration, thermal cycling, and thermal vacuum. The switch is also cycled during item 350 Acceptance/PDA electrical functional tests. Certification Test - The item completed 5,464 inductive and 8,536 resistive cycles during 1/81 which fulfilled the cycle certification requirement of 5,464 and 8,536 respectively. Class I Engineering Change 62806-386 (Toggle Handle Pull Test) has been incorporated since this configuration was certified. C. Inspection - To preclude failure due to internal contamination, the switches are assembled by the vendor in an environmentally controlled room. Assembly and processing is per MIL-S-8805/46. The switches receive in-process cycling and leak checks. The entire item 364 is x-ray inspected for

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	Z/IR	364PMID;		acceptability of brazing.

D. Failure History -

J-EMU-300-006 (10-18-83) The BITE light failed to turn on upon power switchover during PIA tests. The outage was found to be caused by a mechanical failure of Power Mode Switch (364) which prevented proper power switchover. EC 42806-386 added a pull test to the 364 vendor test to insure the normal use. This EC created the -2 switch configuration.

E. Ground Turnaround -

Switches are tested per FEMU-2-001: EMU Checkout in Orbiter V1103-02, EMU Performance Checks.

F. Operational Use -

Crew Response - PreEVA: Trouble shoot problem, if no success, consider third EMU if available. Otherwise, EMU no go for EVA.

EVA: Deactivate EMU battery power, open helmet purge valve, terminate EVA.

Training - Standard 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 EMU battery power. Real Time Data System allows ground monitoring of EMU systems.