

CIL
EMU CRITICAL ITEMS LIST

Page: 1
Date: 11/10/94

12/26/94 SUPERSEDES 12/24/92

ANALYST:

NAME P/N QTY	UNIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
POWER MODE SELECTOR SWITCH, ITEM 364 ----- SV778596-4 (1)	2/2	364FMD1: Stationary in SCU position. CAUSE: Switch mechanism jammed due to contamination, cold welding in vacuum, part failure.	END ITEM: Unable to switch to battery at start of EVA or during checkout sequence. EVE INTERFACE: Unable to operate on battery mode. MISSION: Terminate EVA. Loss of use of one EMU. CREW/VEHICLE: None.	A. Design - Each of the three switches is sealed in a dry nitrogen filled hermetically sealed case. The switches are per MIL-A-8805/46 except that the 10 amp contacts are silver plated. Switch contact rated for 10 amperes. Actual current flow is 3.7 amperes. The handle is designed to withstand a toggle force of 25 lbs. without degradation in subsequent performance. The ball socket of the toggle pivot is greased (Graycoat 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. 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 5,469 inductive and 8,536 resistive cycles during 1/81 which satisfied the cycle certification requirement of 5,464 and 8,536 respectively. Class I Engineering Change 42806-386 (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

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	2/2	364FM01:		
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leak checks. The entire item 364 is x-ray inspected for 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. This outage was found to be caused by a mechanical failure of Power Mode Switch (364) which prevented proper power switchover. EC 42886-386 added a pull test to the 364 vendor test to insure the normal use. This EC created the -2 switch configuration.

E. Ground Turnaround -

Tested during FEMU-R-001 EMU Vacuum Chamber Run, Orbiter Power Interface, and SEMU Comm & Biomed Check.

F. Operational Use -

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

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.