

CIL
 ENMU CRITICAL ITEMS LIST

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12/24/93 SUPERSEDES 12/24/91

ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
FAW SWITCH, ITEM 366 5V771887-3 (1)	3/2RB	366/ND7: Electrical short across output leads. CAUSE: Contamination, faulty wiring.	END ITEM: Simultaneous power to both "OPEM" and "CLOSE" 171 valve terminals causing a short to ground across the CLIV current limiter. GFE INTERFACE: CLIV current limiter would trip (open). Would not be able to switch CLIV position. 171 valve remains in open position during stowage. MISSION: None for single failure. If failed with CLIV open during water recharge and the Item 125 or 134 valve also failed open the reservoir water would leak into the vent loop. Loss of use of one ENMU. CREW/VEHICLE: None.	A. Design - The stationary contacts are part of the external terminal lugs. No interconnecting wiring to fail. Each switch position has dual contacts for redundancy. Switching mechanism and contacts are encased in a hermetically sealed case backfilled with dry nitrogen. Contact is accomplished through a roller type contact. This keeps switching forces to a minimum. The lead wires (M22759/12) are soldered to the external switch terminals per NH8380.4(3A-1). This area is then potted with stycaest to provide strain relief for the leads. The wire bundle is designed to withstand a pull force of 8 lbs. without damage or degradation. B. Test - Testing - Component Acceptance Test - Vendor acceptance tests include 500 actuation cycles, contact resistance, insulation resistance, and dielectric withstanding voltage tests. In-Process Test - Switch operation and continuity are verified during four separate in-process tests during DCN Item 350 assembly. PDA Test - Proper operation is verified during DCN PDA which includes continuity, functional tests, and operating force. The switch is vibrated and exposed to thermal cycles during PDA as part of the DCN. Certification Test - The item completed the 15 year structural vibration and shock cert. requirement during 10/83. The item is cycle certified by similarity to the Item 368 switch. The Item 368 switch has completed 127,000 cycles during 8/85 which is 31 times the cycle cert. requirement of 4,140 cycles. EC42806-399-7 added a lead to the fan switch for the re-designed DCN. This created the -2 switch configuration. Switch certification was not affected. C. Inspection - The external lead wires are inspected for damage as part of source inspection for the part and again during assembly of the DCN.

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	3/2NB	366FMB7:		<p>To preclude failure due to internal contamination, the switches are assembled by the vendor in a Class 100,000 clean room. The switches are flushed internally using chloroform BB and Genesolve D to remove contaminants prior to case welding. After welding, the switches are vacuum baked and back filled with GN2 to a pressure of 3-5 psig and sealed. Leak checks are performed several times during subsequent processing to verify seal integrity. Two x-ray inspections are performed, prior to run-in cycling and after vibration, to verify absence of weld splatter and loose pieces, and to verify contact alignment.</p> <p>D. Failure History - None.</p> <p>E. Ground Turnaround - None.</p> <p>F. Operational Use - Crew Response - PreEVA: single failure undetectable by crew or ground.</p> <p>Training - Standard training covers this failure mode. Operational Considerations - for single failure no constraints.</p>