

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
FAN SWITCH, ITEM 366 64771007-3 (1)	2/1R	366FM02: Fan switch fails open. CAUSE: Electrical open in the wire leads or connections; Linkage mechanism fractured.	END ITEM: Loss of power to the Fan/Separator/Pump Motor. SFE INTERFACE: Loss of cooling water and suit gas circulation. MISSION: Terminate EVA. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of SOP.	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 accomplished through a roller type contact. This keeps switching forces to a minimum. The lead wires (M22750/12) are soldered to the external switch terminals per WRS300.4 (3A-1). This area is then potted with stycaest to provide strain relief for the leads. The wire bundle is designed to withstand a pullforce of 8 lbs, without damage or degradation. B. Test - Component Acceptance Test - Vendor acceptance tests include 500 actuation cycles, contact resistance, insulation resistance, and dielectric withstanding voltage tests. 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. In-Process Test - Switch operation and continuity are verified during in-process tests during DCN item 330 assembly. Certification Test - The item completed the 15 year structural vibration and shock certification requirement during 10/83. The item is cycle certified by similarity to the item 360 switch. The item 360 switch has completed 127,000 cycles during 8/85 which is 31 times the cycle certification requirement of 4,140 cycles. EC 42806-599-7 added a lead to the fan switch for the redesigned 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

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ANALYST:

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2/1R 366FH02:

the BCM.

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 chloroethane BG 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.

D. Failure History -
 None.

E. Ground Turnaround -
 Switch operation is verified per FEMU-R-001, V1103-02 Baseline Data.

F. Operational Use -
 Crew Response - PreEVA: Trouble shoot problem, if no success, consider third EMU if available. Otherwise go for SCB standby without fan.
 EVA/PostEVA: 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 systems. Real Time Beta Systems allows ground monitoring of EMU systems.