

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE

PUSH-TO-TALK SWITCH, ITEM 365 ----- SV767794-2 (1)	2/2	365FM02 Switch stuck in the momentary PTT/MUTE position. Contact weld caused by arcing or a failure of the hermetic seal and exposure to vacuum, jamming, shorting due to contamination.	END ITEM: Switch contacts stuck in PTT/MUTE position. GFE INTERFACE: Loss of all audio radio transmitting capability in EVA. Loss of all receiving capability in IVA. MISSION: Terminate EVA with loss of voice communication. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	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. B. Test - Component Test - Vendor acceptance includes 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 DCM assembly. PDA Test - Switch operating force is checked during DCM PDA. Switch function is checked during DCM PDA electrical tests. Switch is vibrated and exposed to thermal cycles as part of the DCM during PDA. Certification Test - Certified for a useful life of 15 years. C. Inspection - 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 chlorothane BG and Genesolve D to remove contaminants prior to case welding. After welding the switches are vacuum baked and backfilled with GN2 to a pressure of 3-5 psig and sealed. Leak checks are performed 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 - Ground Turnaround tested for non-EET processing per FEMU-R-001, Vacuum Performance and SEMU Communications Check. FEMU-R-001 Para 8.2 EMU Preflight KSC Checkout for EET processing. F. Operational Use - Crew Response - PreEVA: Troubleshoot problem, if no success, consider third EMU if available. Otherwise, EMU no go for EVA. EVA: Terminate EVA. Training - Standard training covers this failure mode. Operational Considerations - Flight rule A15.1.2-2 of "Space Shuttle Operational Flight Rules", NSTS-12820, requires that EVA be terminated if two-way communication between each EV

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		365FM02		crewmember and orbiter, either direct or through relay, is unavailable. Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-365 PUSH-TO-TALK SWITCH
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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