Grumman Corporation

CRITICAL ITEMS LIST

GRUMMAN

ASSY NOMENCLATURE: MANIPULATOR FOOT RESTRAINT

ASSEMBLY PART NO: SED 33100400

PREPARED BY: L. HAHN & F. PERAZZO

REPORT NO: RMS 87 B 8

REVISION A

DATE: 17 MAY 1988

FMEA REF	REV	NAME, QTY & DRAWING REF DESIGNATION	CRIT	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
B2		Vertical Stanchion Stow Latch QTY (1) Dwg C95-122	2/2	B2 - Latch fails closed due to galling or contamination	END ITEM Unable to open latch GFE INTERFACE None MISSION Loss of MFR function; unable to accomplish subsequent mission objectives CREW / VEHICLE None	A. Design Materials per tables 1 & 2 of MSFC-SPEC-522A are certified for traceability/quality. Anodic hardcoating per MIL -A-8625C on alumin interfaces with relative motion minimizes galling and wear. Contamination caused by corrosion by-products eliminated by extensive use of thermal control coating and solid (Moly di-sulfide) lubricant coating.

Grumman Corporation

CRITICAL ITEMS LIST

GRUMMAN

ASSY NOMENCLATURE: MANIPULATOR FOOT RESTRAINT

ASSEMBLY PART NO: SED 39100166

PREPARED BY: L. HAHN & F. PERAZZO

REPORT NO. SMS MFR 9

REVISION A

DATE: 8 JULY 1988

FMEA REF	REV	NAME, QTY & DRAWING REF DESIGNATION	CRIT	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
B2		Vertical Stanchion Slow Latch QTY (1) Dwg C86-122	2/2	B2 - Latch fails closed due to galling or contamination	END ITEM Unable to open latch GFE INTERFACE None MISSION Loss of MFR function; unable to accomplish subsequent mission objectives CREW / VEHICLE None	B. TEST HISTORY 1. Acceptance test per procedure 386 94.01 at Grumman (7/7/83) before and after all tests. ATP includes functional tests of all operating functions and a general visual inspection. 2. Stiffness test per procedure 386-101.01 at Grumman (7/7/83). Demonstrated stanchion and grip less than .5 inch for five pound load in any direction and deflection less than 3 inches lateral and 2 inches longitudinal for 1 hundred pound loads. 3. Vibration and shock test per procedure 386 98.01 at Grumman (7/7/83). Demonstrated ability to withstand design levels without structural failure with no significant resonance. Several screws required the application of loctite. 4. APC/MFR ultimate load tests per STS83 0598 at Rockwell (WD). Loads applied in 10 steps, each comprising 10% of final load no yield was observed at the ultimate load of 114 ft-lbf. 5. Thermal vacuum test at JSC (7/29/84). MFR was operated at ambient temperature, plus 224 F and -137 F (zero is lowest achievable chamber temp) at an average vacuum of .00006 torr. 6. Center of gravity test at JSC (12/29/84). 7. Moment of inertia swing test at JSC (1-1-85). C. INSPECTION 1. NAVFAC inspects all production end items at completion of final assembly. 2. Anodic hard coated aluminum parts inspected for compliance to MIL-A-8625 C by DCAS. Certificate of compliance on file at Grumman Bethpage. 3. Thermal Control Coating process is controlled by inspections, (post prime, cure, post coating and cure), and sample testing for coating thickness, coating adhesion, and emittance/solar absorption. D. FAILURE HISTORY None (per PRACA database). The MFR has been successfully utilized on five missions, STS 51, 61, 51A, 51I, and 61C. E. TURNAROUND Inspection per 52MPIA-05001 N/C 10 DEC 1987 includes a functional test of all MFR operating functions and a general visual inspection. F. OPERATIONAL USE 1. Operational Effect of failure - MFR cannot be used. 2. Crew Action - Attempt to disassemble latch or remove contamination. 3. Crew Training - Crew is trained in the use of general purpose tools available for this task. 4. Mission Constraints - None. 5. In flight Checkout - Crew will inspect latch at the time of its use.