

Grumman Corporation

CRITICAL ITEMS LIST

GRUMMAN

ASSEMBLY NAME: MANIPULATOR FOOT RESTRAINT

PREPARED BY: L. HAHN & F. PERAZZO

REPORT NO: RMS 91 00

ASSEMBLY PART NO: 860 38 00160

REVISION: A

DATE: 17 MAY 1986

FMEA REF	REV	NAME, QTY & DRAWING REF DESIGNATION	CRIT	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
G2	A	Foot Platform Assembly (FPA) QTY (1) Dwg C95-123	2/2	G2 - Latch jammed in notch of indexing mechanism due to contamination or galling	<p>END ITEM Foot platform will be locked in one position; will not rotate; depending upon position of FPA at time of jam, it may not be possible to slow MFR</p> <p>GFE INTERFACE None, since MFR will be jammed if FPA is jammed in out-of-neutral position</p> <p>MISSION Loss of MFR; unable to accomplish subsequent mission objectives</p> <p>CREW/VEHICLE None</p>	<p>A. Design Materials per tables 1 & 2 of MSFC-SPEC-522A are certified for traceability/quality. Anodic hardcoating per MIL-A-8625C on aluminum 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 tri-sulfide) lubricant coating.</p>

APPROVED
 PERAZZO, G

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ASSY NOMENCLATURE: MANIPULATOR FOOT RESTRAINT

PREPARED BY: L. HAHN & F. PERAZZO

REPORT NO: R62-37 R-6

REVISION: A/B

ASSEMBLY PART NO: BFD 300066

DATE: 8 JULY 1986

FMEA REF	REV	NAME, QTY & DRAWING REF DESIGNATION	CRIT	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
G2	A	Foot Platform Assembly (FPA) QTY (1) Dwg C35-123	2/2	G2 - Latch jammed in notch of indexing mechanism due to contamination or galling	END ITEM Foot platform will be locked in one position; will not rotate; depending upon position of FPA at time of jam, it may not be possible to stow MFR. GFE INTERFACE None, since MFR will be jettisoned if FPA is jammed in out-of-neutral position. MISSION Loss of MFR; unable to accomplish subsequent mission objectives. CREW/VEHICLE None	B. TEST HISTORY 1. Acceptance test per procedure 300-34.01 at Grumman (7/7/83) before and after all tests. ATP includes functional tests of all operating functions and a general visual inspection. 2. Stillness test per procedure 300-40.01 at Grumman (7/7/83). Demonstrated stiction and play less than .5 inch for five point load in any direction and deflection less than 3 inches lateral and 2 inches longitudinal for 1 hundred pound load. 3. Vibration and shock test per procedure 300-34.03 at Grumman (7/7/83). Demonstrated ability to withstand design levels without structural failure with no significant resonance. Several scores required the application of lockers. 4. APCMFR ultimate load tests per STS 03-0044 at Rockwell (8/83). Loads applied in 14 steps, each comprising 80% of final load no yield was observed at the ultimate load of 11.1 kN. 5. Thermal vacuum test at JSC (7/29/84). MFR was operated at ambient temperature, plus 324 K and -137 K (average lowest achievable chamber temp) at an average vacuum of 80096 Torr. 6. Center of gravity test at JSC (12/2/84). 7. Moment of inertia swing test at JSC (7/8/85). C. INSPECTION 1. NAVPRO inspects all production and 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 061 page. 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 surface/solar absorption. D. FAILURE HISTORY None (per PRACA database). The MFR has been successfully utilized on five missions, STS 11, 12, 51A, 51L, and 61C. E. TURNAROUND Inspection per 528PIA 06001 N/C in 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 restored if possibly could not be used on a second EVA if hardware is jettisoned. 2. Crew Action: none 3. Crew Training: none 4. Mission Constraints: none 5. In-Flight Checkout: Operation of the Foot Platform Assembly will be checked out at time of use.