

Grumman Corporation

CRITICAL ITEMS LIST

GRUMMAN

ASSEMBLY NOMENCLATURE: MANIPULATOR FOOT RESTRAINT

PREPARED BY: L. HAHN & F. PERAZZO

REPORT NO: 1443 87 R 8

REVISION: A

DATE: 17 MAY 1988

ASSEMBLY PART N.O.: 869 20102 000

FMEA REF	REV	NAME, QTY & DRAWING REF DESIGNATION	CRIT	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
F2	A	Hand Hold Assembly (HHA) (containing retainers for tool boards) QTY (1) Dwg C95-118	2/2	F2 - Latch jammed in notch of indexing mechanism due to contamination or galling	<p>END ITEM HHA locked in one position; unable to stow vertical stanchion and, consequently, MFR</p> <p>GFE INTERFACE None, since MFR will be jettisoned</p> <p>MISSION Loss of MFR; unable to accomplish subsequent mission objectives</p> <p>CREW/VEHICLE None</p>	<p>Δ Design Materials per tables 1 & 2 of MSFC-SPEC 522A are certified for traceability/quality. Anodic hardcoating per MIL-A-8625C on alumina 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.</p>

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CRITICAL ITEMS LIST

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GRUMMAN

ASSEMBLY NAME/CLATURE: MANIPULATOR FOOT MOUNT

PREPARED BY: L. HAHN & F. PERAZZO

REPORT NO.: 8407 87 H

REVISION: A B

ASSEMBLY PART NO.: 860 2010310

DATE: 9 MAY 1988

FMEA REF	REV	NAME, QTY & DRAWING REF DESIGNATION	CRIT	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
F2	A	Hand Held Assembly (HHA) (containing retainers for tool boards) QTY (1) Dwg C85-110	2/2	F2 - Latch jammed in notch of indexing mechanism due to contamination or galling	END ITEM HHA locked in one position; unable to show vertical slantion and, consequently, MFR GFE INTERFACE None, since MFR will be jettisoned MISSION Loss of MFR unable to accomplish subsequent mission objectives CREW/VEHICLE None	B. TEST HISTORY 1. Acceptance test per procedure 380-9101 at Grumman (7/7/83) before and after all tests. ATP includes functional tests of all operating functions and a general visual inspection. 2. Sulfur test per procedure 380-10101 at Grumman (7/7/83). Demonstrated slantion and play less than .5 inch in five points in any direction and deflection less than 3 inches lateral and 2 inches longitudinal for 1000 pound loads. 3. Vibration and shock test per procedure 380-9806 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 STS 83-0944 at Rockwell (8/83). Loads applied in 11 steps, each comprising 10% of final load no yield was observed at the ultimate load of 14 x final. 5. Thermal vacuum test at JSC (7/29/84). MFR was operated at ambient temperature, plus 224 F and -137 F (average lowest active altitude chamber temp) at an average vacuum of .0005 Torr. 6. Center of gravity test at JSC (12/2/84). 7. Moment of inertia swing test at JSC (1/4/85) C. INSPECTION 1. NAVPRO 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 DGAS. Certificate of compliance on file at Grumman Ballpage. 3. Thermal Control Coating process is controlled by inspections, post paint, cure, post coating and cure, and sample testing for coating thickness, coating adhesion, and environmental absorption. D. FAILURE HISTORY None (per PRACA database). The MFR has been successfully utilized on five missions, STS 11, 12, 51A, 51L, and 51C. E. TURNAROUND Inspection per 528PIA-0501 (MFC) 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 could not be restrained if possibly could not be used on a second EVA if it had to be jettisoned. 2. Crew Action - none. 3. Crew Training - none. 4. Mission Constraints - none. 5. In Flight Checklist - Operation of Hand Held Assembly will be checked out at line of use.

MFR - 20

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