NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		103FM10Z		
FABRIC ATTACHMENT RING ITEM 103 (1) LEFT (1) RIGHT ---------- 10145-05 (2)	2/2	Jammed open or mated with arm bearing or sizing ring. Defective material; latch, spring or sizing ring. Foreign matter in latch.	END ITEM: Unable to lock or unlock fabric attachment ring to/from sizing ring or arm bearing. GFE INTERFACE: Unable to assemble or disassemble fabric attachment ring to/from sizing ring or arm bearing. MISSION: Terminate EVA prep. Loss of EMU use for designated crewmember. 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 fabric attachment ring is made of 7075-T73 Aluminum Alloy and is finished with Type II CLI anodize. All surfaces have a 63 finish. The locking system consists of two spring loaded sequential locks and one manual lock. The locking latches are made of 7075-T73 Aluminum Alloy and the spring and retaining screws are made of stainless steel. The threaded portion of the fabric attachment ring is designed for "one way" initiation of threaded engagement to ensure proper alignment and locking. Normal rotation loads result in arm bearing rotation which precludes torque induced loads into the fabric attachment rings. The threaded protion of the fabric attachment ring is coated with a dry film lubricant to allow smooth travel of the ring when being mated. B. Test - Acceptance: The fabric attachment ring is subjected to testing per ATP 10145 at Airlock with ILC source verification. PDA: The following tests are conducted at the Lower Arm level in accordance with ILC Document 0111-710112: 1. Initial leak test at 4.3 +/- 0.1 psig to verify leakage les than 6.0 scc/min. 2. Proof pressure test at 8.0 + 0.2 - 0.0 psig to verify no structural damage. 3. Post-proof pressure leak test at 4.3 +/- 0.1 to verify leakage less than 6.0 scc/min. 4. Final leak test at 4.3 +/- 0.1 psig to verify leakage less than 6.0 scc/min. Certification: The fabric attachment ring was successfully tested manned during SSA certification to duplicate 458 hours operational life (Ref. ILC Report 0111-711330). The following usage, reflecting requirements of significance to the fabric attachment ring, was documented during certification. Requirement / S/AD / Actual Elbow Cycles: 49660 / 102000 Engage/Disengage: 300 / 800 Don/Doff: 98 / 400 Pressure Hours: 458 / 916 C. Inspection - Components and material manufactured to ILC requirements at an Approved Supplier are documented from procurement through shipping by the supplier. ILC incoming receiving inspection verifies that the materials received are as identified in the procurement documents, that no damage has occurred during shipment and that supplier certifications have been received which provides traceability information. The following MIPs are performed during the arm assembly manufacturing process

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		103FM10Z		to assure that the failure causes are precluded from the fabricated item: 1. Visually inspect static seal for damage. 2. Visually inspect ring for scratches, burrs. During PDA, the following inspections points are performed at the arm assembly level per ILC Document 0111-710112: 1. Inspection for cleanliness to VC level. 2. Visual inspection for damage, wear or material degradation. 3. Visual inspection for damage following proof-pressure test. D. Failure History - B-EMU-103-A038 (10/22/96). During installation of fabric attachment ring onto lower arm, manual lock button would not remain in open position. Found mating fabric restraint and bladder flanges bulge into button slot, pushing button back towards closed position. No corrective action taken. E. Ground Turnaround - Inspected for non-EET processing per FEMU-R-001, Pre-Flight Inspections and Final Structural and Leakage, SSA Connector Verification. None for EET processing. Additionally, every 4 years chronological time or 229 hours of manned pressurized time, the sizing ring is diassembled, cleaned, inspected, lubricated and reassembled. F. Operational Use - Crew Response - Pre EVA/Post EVA: Trouble shoot problem, Consider use of third EMU. If no success terminate EVA prep. EMU is no go for EVA. EVA: When CWS data confirms SOP avtivation, abort EVA. Training - Standard training covers this failure mode. Operational Consideration - Flight rules define go/no go criteria related to EMU pressure integrity and regulation. EVA checklist procedures 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-103 ARM ASSEMBLY

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____ 5/27/02
HS - Project Engineering

Approved by: _____
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NASA - MOD

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NASA - Crew

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NASA - Program Manager