

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE															
BRIEF FABRIC ATTACHMENT RING ITEM 104 (1) LEFT (1) RIGHT ----- 10156-02 (2)	2/1R	104FM28K  Loss of primary pin of brief restraint bracket.  Defective material: bracket, pin or retention screws.	END ITEM: Loss of primary axial load restraining capability.  GFE INTERFACE: Axial load will be transferred to secondary restraint.  MISSION: None with loss of primary restraint. Loss of EVA with loss of secondary restraint.  CREW/VEHICLE: None with single failure. Loss of crewman with loss of secondary restraint.  TIME TO EFFECT /ACTIONS: Minutes.	A. Design - The restraint gracket and primary pin are fabricated from 17-4 stainless steel bar stock. The bracket and pin are heat treated to a condition H-1050, ultrasonically cleaned, passivated and either electropolished or dry hone finished. Two threaded 17-4 stainless steel pins are utilized to retain the 17-4 stainless steel pin which has a 16 finish to preclude restraint webbing abrasion.  Tensile testing of the restraint bracket pin has demonstrated a minimum ultimate strength of 1779 lbs and a yield strength of 1602 lbs. At 4.4 psid (normal operating pressure) the S/AD limit load is 593 lbs, giving the bracket pin a safety factor of 3.0 for ultimate and 2.7 for yield. At 5.5 psid (max failure pressure) and 8.8 psid (max BTA operating pressure) the bracket pin provides safety factors for ultimate of 3.2 and 3.7 respectively. The S/AD minimum safety factor for hardware at 4.4 psid is 2.0 for ultimate and 1.5 for yield. At both 5.5 psid and 8.8 psid the S/AD minimum safety factor for hardware is 1.5 for ultimate.  B. Test - Acceptance: See inspection.  PDA: During PDA, the following inspection points are performed at the LTA assembly level in accordance with ILC Document 0111-710112. Inspection for cleanliness to VC level. Verification of proper engagement and operation.  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 ring, was documented during certification:															
				<table border="1"> <thead> <tr> <th>Requirement</th> <th>S/AD</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>Knee/Cycles</td> <td>9078</td> <td>20000</td> </tr> <tr> <td>Don/Doff</td> <td>98</td> <td>400</td> </tr> <tr> <td>Pressure Hours</td> <td>458</td> <td>916</td> </tr> <tr> <td>Walking Steps</td> <td>4320</td> <td>77760</td> </tr> </tbody> </table>	Requirement	S/AD	Actual	Knee/Cycles	9078	20000	Don/Doff	98	400	Pressure Hours	458	916	Walking Steps	4320	77760
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		REDUNDANCY SCREENS: A-PASS B-N/A C-PASS		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 brief assembly manufacturing process to assure that the failure causes are precluded from the fabricated item:															

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		104FM28K		<p>1. Visual inspection upon completion of the restraint webbing pull test for signs of damage.</p> <p>During PDA, the following inspection points are performed at the arm assembly level per ILC Document 0111-710112:</p> <ol style="list-style-type: none"><li>1. Inspection for cleanliness to VC level.</li><li>2. Visual inspection for damage, wear or material degradation.</li><li>3. Visual inspection for damage following proof-pressure test.</li></ol> <p>D. Failure History - None.</p> <p>E. Ground Turnaround - None.</p> <p>Every 4 years chronological time or 229 hours of manned pressurized time, the fabric ring is disassembled, cleaned, inspected, lubricated and assembled.</p> <p>F. Operational Use - Crew Response - Pre EVA/Post EVA: If not detected, no response. If detected audibly or tactilly, troubleshoot problem. If no success use spare EMU available. EVA: Single failure not detectable, no response.</p> <p>Training - No training specifically covers this failure mode.</p> <p>Operational Response - Not applicable.</p>

EXTRAVEHICULAR MOBILITY UNIT  
SYSTEMS SAFETY REVIEW PANEL REVIEW  
FOR THE  
I-104 LOWER TORSO ASSEMBLY (LTA)  
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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