NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		104FM13Y		
BRIEF/WAIST ASSEMBLY, ITEM 104 ---------- 0104-210605-07/08/09/10/11/12 (1)	3/1RA	External gas leakage (ball port or test port). Contamination, wear or deterioration of the ball port plug O-ring or test port plug O-ring. Defective or loose screw in test port plug or ball port plug. Defective or loose ball port O-ring or test port plug O-ring.	END ITEM: Gas leakage through test port or ball port seal. GFE INTERFACE: Opening of leakage path between ball race area and ambient. MISSION: No effect with single failure (loss of test port seal or ball port seal). With second failure (loss of primary seal) high O2 use. Abort EVA. CREW/VEHICLE: No effect with single failure (test port or ball port seal) or second failure (primary seal). Loss of crewman with third failure (loss of SOP). TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: Minutes. TIME REQUIRED: Immediate. REDUNDANCY SCREENS: A-FAIL	A. Design - The fluorosilicane "O" rings mounted in the test port or ball port plug are not exposed to the pressure environment of the SSA under normal operating conditions. These "O" rings are in a static condition and are unlikely to be damaged or degrade during usage. Proper lead-in chamfers and radii on making hardware components preclude damage to "O" ring during installation. The two screws are fabricated from A-286 stainless steel and procured to A.N. specifications. Loss of the screws is precluded in design by adherence to standard engineering torque requirements for screw installations. B. Test - Component Acceptance Test: The waist bearing is subjected to testing per Airlock ATP 10057 or ATP 10043 at Airlock with ILC source verification. During acceptance testing a test fixture with the same size "O" ring is utilized for pressure testing. No specific pressure test is conducted on the test port plug assembly. Certification: The dual seal waist bearing successfully passed SSA certification testing (manned) to duplicate operational life (Ref. "1153 hour Cert Report for Redesigned Dual Seal Waist Bearing, ILC Document 0111-710428). In addition, the bearing has been subjected to screening tests where the bearing is bench cycled to a crew familiarization test profile with constant leakage monitoring. Both seals in the cert bearing have been subjected to a proof pressure test at 8.0 psi. 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 MIP's are performed during the waist assembly manufacturing process to assure the failure cause is precluded from the fabricated item: 1. Visual inspection of the pressure seal and environmental seals for gouges, nicks, tears or degradation. 2. Verification of cleanliness to VC level. 3. Visual inspection after proof and leakage testing for deformation, defects or damage. PDA: A leakage path past the test port plug seal would not be detected during pda testing. (PDA and Acceptance testing are same test). D. Failure History - None.

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		104FM13Y	B-N/A C-PASS	E. Ground Turnaround - None, for every component which is within its limited life requirements. Also, every 4 years or 229 hours of manned pressurized time the waist bearing is removed from the LTA and subjected to a complete visual inspection (interior and exterior surfaces) for material damage and degradation. F. Operational Use - Crew Response - Pre/Post EVA - No Response. Single failure not detectable. EVA: No response, single failure not detectable. Training: No training specifically covers this failure mode. Operational Considerations - Flight rule A15.1.2-2 of "Space Shuttle Operational Flight Rules", NSTS-12820 defines go/no go criteria related to EMU pressure integrity. Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) 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-104 LOWER TORSO ASSEMBLY (LTA)

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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