

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
SHUTOFF VALVE, ITEM 113C ----- SV778873-15 (1)	2/1R	113CFM03  External gas leakage downstream of seat.  Seal failure.	END ITEM: Primary oxygen supply leakage to ambient.  GFE INTERFACE: Excessive consumption of the primary oxygen supply. The SOP is automatically activated during EVA if the suit pressure drops to 3.33 psia minimum.  MISSION: Terminate EVA. Loss of use of one EMU.  CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of SOP.  TIME TO EFFECT /ACTIONS: Minutes.  TIME AVAILABLE: Minutes.  TIME REQUIRED: Immediate.  REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	A. Design - Leakage is through one static O-Seal or one dynamic radial seal. Seal design configuration, dimensions, and rigidity of assembly provide squeeze under all load conditions. Seals have back-up rings to prevent extrusions.  B. Test - Vendor Component Acceptance Test - The vendor, CTI, performs an external leakage test to assure seal integrity.  PDA Test - None.  Certification Test - Certified for a useful life of 20 years (Ref. EMUM-0083).  C. Inspection - The running and final torque of the threaded connector is verified by Vendor and DCAS inspection. A trial assembly is performed on all details and then they are visually inspected. All details, gases and test facilities are cleaned and inspected to HS3150 EM50A to preclude contamination. Details, including the O-ring, O-ring grooves and sealing surfaces, are 100% inspected per drawing dimensions and surface finish characteristics. Details are manufactured from material with certified physical and chemical properties.  D. Failure History - B-EMU-115-A003 (01/31/96) - Shear Plate S/N 004 installed in PLSS S/N 1005 failed 72 hour high pressure O2 leakage testing. Leakage isolated to Item 113 Shut Off Valve. Found damage to Valve seat. Most probable cause was a burr or flake generated during manufacturing drilling and deposited on seat. Particle broke free during subsequent operational cycle. Valve manufactured before improved 30X inspected initiated in 1984. No corrective action.  B-EMU-115-A006 (12/16/01)- PLSS S/N 1003, Shear Plate S/N 015 failed external leak test per P528/SEMU-621 FEMU-R-001, Para 7.3.3.1.1.9. Leakage was approx. $2.32 \times 10^{-4}$ scc/sec O2, which is out of spec for FEMU-R-001 spec max leakage rate but within HS and Carleton spec max leak rate. This amount of leakage would have no flight impact. CCBD H7217 authorizes revision of FEMU-R-001 to reflect correct HS and Carleton spec max allowable leak rate of $2.7 \times 10^{-4}$ scc/sec O2.  B-EMU-115-A007 (2/13/02) - Bubbles noted when Leak Tec was applied to Item 113C during reduced processing with the O2 actuator in the "IV" position. Tracked by B-EMU-115-A006.  B-EMU-115-A008 (2/14/2) - Bubbles noted when Leak Tec was applied to Item 113C during reduced processing with the O2 actuator in the "IV" position. Tracked by B-EMU-115-A006.  E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, EMU vacuum performance tests. None for EET processing.  F. Operational Use - Crew Response -

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		113CFM03		PreEVA: Trouble-shoot problem, if no success, consider EMU 3 if available. EMU no go for EVA. PostEVA: N/A EVA: When CWS data confirms an accelerated primary O2 use rate, terminate EVA. Training - Standard EMU training covers this failure mode. Operational Considerations - Flight rules define go/no go criteria related to EMU pressure integrity. 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-113 PRIMARY PRESSURE CONTROL MODULE  
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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