

| NAME P/N QTY | CRIT | FAILURE MODE & CAUSES | FAILURE EFFECT | RATIONALE FOR ACCEPTANCE |
|--|-------|---|--|---|
| CHECK VALVE, ITEM 113A ----- SV778873-15 (1) | 3/1RB | 113AFM02 Internal gas leakage, fails open. Seat contamination, seal failure or jamming of ball. | END ITEM: Oxygen leakage across ball seat in check direction to the primary 02 refill line. GFE INTERFACE: 02 in primary tank flows backwards into the fill line and is sealed by the common multiple connector (Item 330) 02 disconnect. MISSION: None for single failure. Terminate EVA for double failure of 113A and 330 02 disconnect. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of DCM multiple connector and SOP. TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: Minutes. | A. Design - A Smooth sapphire ball free floats in a vespel cavity. The valve inlet and outlet are protected by a 25 micron filter. The ball is preloaded into the seat with up to 5.0lb spring force to form the seat. The o-seal design configuration dimensions and rigidness of assembly provide squeeze under all load conditions. B. Test - Component Test - The item is subjected to an internal leakage test at the supplier in which a maximum of 0.09 ccN2/min is allowed with the check valve pressurized to 900 psig in the reverse direction. PDA Test - A check valve leakage test, identical to the above component test, is conducted per AT-E-115 para. 9.0 except 0.25 cc N2/min. is allowed. Certification Test - Certified for a useful life of 20 years (Ref. EMUM-0083). C. Inspection - Details are 100% inspected per drawing dimensions and surface finish characteristics. Details are manufactured from material with certified physical and chemical properties. All details, gases and test facilities are cleaned and inspected to H53150 EM50A to preclude contamination clogging. The ball seat is visually inspected under 30x magnification for sharp edges and surface defects. D. Failure History - H-EMU-113-A003 (6/15/83) Leakage past the check valve due to ball seat defect. Inspection of ball seat at 30X magnification was added. H-EMU-113-A009 (7/25/90) - Item 113A check valve had reverse leakage of 24 scc/hr. (Allowable specification leakage is 15 scc/hr max.) Visual inspection revealed no damage or contamination. No Corrective Action taken. E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, 113A Leakage (High Pressure Check Valve). None for EET processing. F. Operational Use - Crew Response - PreEVA: No response, single failure undetectable by crew or ground. EVA: No response, single failure undetectable by crew or ground. Training - No training specifically covers this failure mode. Operational Considerations - For single failure, no constraint. EVA checklist procedures verify hardware integrity and system operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems. |

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113AFM02

TIME REQUIRED:
Immediate.

REDUNDANCY
SCREENS:
A-PASS
B-FAIL
C-PASS

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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