

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
CHECK VALVE, ITEM 120C ----- SV785844-17 (1)	2/1R	120CFM03 External gas leakage. Seal failure (3).	END ITEM: Bladder gas leakage to ambient. GFE INTERFACE: Excessive consumption of primary oxygen supply. The SOP is automatically activated during EVA if the suit pressure drops to 3.33 psid. 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: Seconds. TIME AVAILABLE: Minutes. TIME REQUIRED: Immediate. REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	A. Design - There are two radial seals and two face seals which prevent external leakage. All seals are elastomeric O-rings which provide required sealing by conforming to the surface being sealed. B. Test - Component Acceptance Test - Two external leakage tests are performed per AT-E-120-2. In the first test, the item is pressurized to 14.6 - 15.6 psig with N2 and then submerged in water for 10 minutes minimum. The maximum allowable leakage is 0.06 scc/min. In the second test, the item is pressurized to 22.2 - 28.2 psig with N2 and then submerged in water for 10 minutes minimum. The leakage is not to exceed 0.1 scc/min. PDA Test - An external leakage test is performed per SEMU-60-010. The O2 feedwater circuit is pressurized to 14.6 - 15.7 psig with a mixture of 98% N2 and 2% He. A helium sniff test of the check valve must reveal no evidence of external leakage. Certification Test - Certified for a useful life of 25 years (ref EMUM-1418). C. Inspection - Seal failure - The four interfacing surfaces (two radial seals and two face seals) between the valve housing, check valve fitting and test port cover are 100% inspected to meet dimensional and surface finish requirements. The O-seals are inspected for surface characteristics per SVHS3432; 100% for Classes I and II, at least a 1.5 AQL for Class III. An external leakage test is performed as an inprocess test allowing no more than 0.06 scc/per minute leakage in a ten minute test period. D. Failure History - None. E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, Final SEMU Gas Structural and Leakage. None for EET processing. F. Operational Use - Crew Response - PreEVA: No response, single failure unlikely to be detected by crew or ground. PostEVA: N/A EVA: When CWS data confirms an accelerated primary O2 use rate, terminate EVA. If CWS data confirms a loss of suit pressure integrity coupled with an accelerated primary O2 use rate, abort EVA. Training - Standard EMU training covers this failure mode. Operational Considerations - Consider vacuum O2 recharge to recover EMU operation. Flight rules define go/no go criteria related to EMU suit pressure regulation. EVA checklist and FDF procedures verify hardware integrity and operational status prior to EVA. Real Time Data System allows ground monitoring of EMU

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120CFM03

systems.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-120 DUAL MODE RELIEF VALVE
CRITICAL ITEM LIST (CIL)
EMU CONTRACT NO. NAS 9-97150

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