

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
SUIT PRESSURE REGULATOR, ITEM 113D ----- SV778873-15 (1)	2/1R	113DFM02 Fails closed or reduced flow. Contamination, clogging of the inlet filter; ball actuator or return plunger jams; spring failure.	END ITEM: Unable to deliver O2 to suit and maintain suit pressure. GFE INTERFACE: The suit pressure drops below 4.2 psi. The SOP is automatically activated during EVA if the suit pressure drops below 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: Immediate. TIME AVAILABLE: Minutes. TIME REQUIRED: Immediate. REDUNDANCY SCREENS: A-PASS B-PASS	A. Design - Stem clearance is 0.001-0.0015. Material combination resists galling and wear (Stem is Inconel 718, Body is Al-Bronze). Valve and sense cavity are protected by a 25 micron filter upstream and downstream and a redundant filter in the upstream shutoff valve. Oxygen system cleanliness precludes any significant amount of contamination clogging filters. A drop in regulator pressure of 0.5 psi results in a 4 lb load to open the valve stem. The springs are operating at a stress below yield point. B. Test - Vendor Component Acceptance Test - The manufacturer, CTI, performs a sea level performance test to assure that the regulator has not failed closed. Contamination is reduced/minimized by cleaning all of the internal details and oxygen passageways to HS3150 EM50A. The test facility and gases also meet the requirement. PDA Test - A failed closed regulator would be detected during testing per SEMU-60-010. Regulator performance tests verify the ability of the regulator to control the outlet pressure. In the IV mode at 850-950 psia inlet and flows of .31-.35 lb/hr and .04-.06 lb/hr the regulator must maintain the outlet pressure at 0.4-1.4 psig. At an inlet pressure of 75-85 psia and a flow of .31 - .35 lb/hr it must maintain the outlet at 0.4-1.4 psig. In the EVA and "PRESS" modes at 850-950 psia inlet and flows of .31-.35 lb/hr and .04-.06 lb/hr the regulator must regulate the outlet pressure to 4.2-4.4 psig. At 75-85 psia inlet and a flow of .31-.35 lb/hr it must regulate to 4.2-4.4 psig. 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 HS3150 EM50A to preclude contamination clogging. The running and final torque of all threaded connections are verified by Vendor and DCAS inspection. A trial assembly is run on all details and then they are visually inspected. The demand valve pintle and balance stem are manually depressed to assure free motion. D. Failure History - H-EMU-113--001 (1/26/01) - During inspection of Item 113 housings, several bores showed evidence of anodized coating flaking. Investigation determined that variations in manufacturing process related anodic coatings resulted in damage caused by ultrasonic cleaning. Missing anodic coating deemed not a safety or flight concern. Alternate cleaning process to be investigated. E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, V1103 Performance Data and Item 113 Regulator Check. None for EET processing.

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		113DFM02	C-PASS	F. Operational Use - Crew Response - 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 loss of suit pressure regulation, terminate EVA. Training - Standard EMU training covers this failure mode. Operational Considerations - Flight rules define go/on 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 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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