

CIL
EMJ CRITICAL ITEMS LIST

12/24/91 SUPERSEDES W1/02/90

ANALYST:

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NAME P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
PRESSURE GAGE, ITEM 2150 SV799042-3 (1)	1/1	2130FM03N: External gas leakage. CAUSE: Seal failure.	END ITEM: Leakage of emergency O2 supply to ambient. C/E INTERFACE: Premature detection of SOP. MISSION: Abort EVA. CREW/VEHICLE: Possible loss of crewman with excessive leakage.	A. Design - The gauge to regulator seal is a radial silicone O-seal with a carbon backup ring on one side and a delta Kel-F back up ring on the other. The seal design configuration dimension and rigidity of assembly provide squeeze under all load conditions. The maximum expected number of gauge operating pressure cycles during the life of this item is 1000, and proof pressure cycles is 25. B. Test - Component Acceptance Test - The vendor, Krauss, performs five (5) stress proof pressure cycles to 15,000 psi and five (5) proof pressure cycles to 11,200 psi prior to gage calibration. If hysteresis remains, then five (5) more proof pressure cycles to 11,200 psi are performed prior to a re-calibration. The gage is scrapped if hysteresis still remains. This procedure ensures that the bourdon tube is properly strain hardened. POA Test - The item is proof pressure tested at 11,100 - 11,300 psig O2 for 5 minutes minimum, and then visually inspected for evidence of distortion, cracks, or other defects. Subsequently, the item is externally leak tested with a 2% He and 98% N2 gas mixture at a pressure of 5000 - 6200 psig in a chamber vacuum. Leakage must not exceed 5.55×10^{-5} cc/sec He (5.55 x 10 ⁻⁵ cc/sec He max represents total end item (SOP) leakage). The accuracy of the item is checked by pressurizing it to 200 and 4000 psig with tolerances of +500/-200 and +/-600 psig respectively. Certification Test - During 5/89 the SV799045 SOP completed 5000 on/off cycles and 180 proof cycles which is four times the 15 year expected use cycles. During the flow testing phase, the SOP completed 325 total hours of regulation at 5 ppm or 0.16 pph. The SOP assembly also completed the 15 year random vibration, sinusoidal vibration, design shock and bench check testing. During 8/82 the SV767710 SOP completed 112 blowdown cycles which is 3 times the cycle certification requirement at 35 to satisfy the SV799045 certification requirements.

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	0/1	2135FM03A1		

C. Inspection -
A trial assembly is performed on all details and then they are visually inspected. The running and final torque of all threaded connections are verified by Vendor and DCAS inspection. There is 100% inspection, including proof pressure and leakage test of all the elements exposed to the high pressure medium during vendor acceptance testing.

D. Failure History -
None.

E. Ground Test Record -
Tested per FEMU-R-001, SOP External Leakage.

F. Operational Use -
Crew Response -
EVA: Since EVA termination is required as soon as SOP is flowing, crew would abort EVA when excessive SOP usage is detected.
Training - Standard EMU training covers this failure mode.
Operational Considerations -
EVA checklist procedures verify hardware integrity and systems operational status prior to EVA.
Flight rules define go/no go criteria related to EMU pressure integrity and regulation.
Flight rules define EMU as lost for loss of operational SOP.
Real Time Data System allows ground monitoring of EMU systems.