

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
OXYGEN MANIFOLD ----- SV778559-1 (1) ----- PACKAGING (EOP), ITEM 200 ----- SV779845-00	1/1	200FW02A: External gas leakage, tube from bottle to regulator. CAUSE: Manifold tube rupture.	END ITEM: Leakage of emergency O2 supply to ambient. GFE INTERFACE: Premature depletion of SDP supply. MISSION: Abort EVA. CREW/VEHICLE: Possible loss of crewman with excessive leakage.	A. Design - The Oxygen Manifold tube has a minimum wall thickness of 0.045 in., which makes the 0.250 O.D (nominal) tube a thick walled cylinder. The maximum operating pressure in the tube is 7,400 psi supplied by the secondary oxygen bottles. The tube material is Monel-K 500. Analysis indicates that the minimum tube factor of safety is 2.9 at a burst pressure of 14,800 psi, and 5.7 at maximum operating pressure. B. Test - FDA Test - An external leakage test is performed per SEMU-68-007. The SDP is pressurized to 4000-6200 psig with a mixture of 90% N2 and 10% He. Leakage is measured with a mass spectrometer and cannot exceed 5.55×10^{-5} acc/sec. Certification Test - The item completed 984 No Flow Hours during 8/82 which is fifty (50) times the certification requirement of 18 hours. The item completed 112 blowdown cycles during 8/82 which is three (3) times the cycle certification requirement of 35. The item completed the 12 year structural vibration and shock certification requirement during 10/83. No Class 1 Engineering changes have been incorporated since this item was certified. C. Inspection - Materials inspection verifies the chemical composition of the tube and fitting material. Each brace is X-ray inspected per MS1614 Type I. Each assembly is hardness inspected (Spec: AC27) after brazing and heat treatment. O-ring sealing surfaces are 100% inspected for surface characteristics per SVHR3432 Class 41. The Oxygen Manifold fitting is trial assembled, removed, and inspected for evidence of damage or particles caused by the assembly process. This inspection requires a Mandatory Inspection Point. The O-ring is lubricated with Braycote (SWP213) prior to final assembly. D. Failure History - None.

12/24/91 SUPERSEDES 88/31/90

ANALYST:

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	1/1	Z60PNDZA:		<p>E. Ground Turnaround - Tested for Leaks per FEMU-R-003, SOP servicing for flight. Helium leak check.</p> <p>F. Operational Use - Crew Response - EVA: Since EVA termination is required as soon as SOP is flowing, crew would abort EVA when excessive SOP rate is detected. Special 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.</p>