

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
COMMON MULTIPLE CONNECTOR, ITEM 330 ----- SV778872-26 (1)	3/1RA	External leakage, uncoupled, oxygen. Failure, poppet sticks open, return spring fractures, O- seal bypass leakage, contamination, seat.	END ITEM: Oxygen leakage across seat to ambient. GFE INTERFACE: Oxygen in fill line up to 113A check valve leaks to ambient. MISSION: None for single failure. Mission termination with 113A internal leakage because the PLSS O2 tanks would be dumped to ambient. CREW/VEHICLE: None for single and double failures. Possible loss of crewman with loss of check valve (113A) the SOP, and 330. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: Minutes. TIME REQUIRED: Immediate. REDUNDANCY	A. Design - The DCM oxygen supply coupling has three external leakage paths when uncoupled. One path is blocked by a single static radial O-ring. The second path is blocked by a face seal. The O-ring design configuration, dimensions and rigidness of assembly provide squeeze under all loading conditions. The third external leakage path is through a seated poppet valve designed to minimize friction and to maximize sealing characteristics. The poppet seal is machined from Teflon and it mates against an Nitronic 60 surface machined to a 32 microinch surface finish. The poppet return spring is designed to exert a sealing force of 4 pounds on the valve when seated and is designed to be cycled for 100,000 cycles minimum. All parts are required to be cleaned to HS 1550, level EM 50A. This ensures there will not be any foreign particles to hold the valve open. B. Test - Component Acceptance: The uncoupled external oxygen leakage test is performed per Air-Lock Inc. ATP 9619-11. For the leakage test, the O2 port is pressurized to 1005+/-32 psig. Leakage cannot exceed 1.0 scc/hr N2. PDA: An uncoupled external leakage test is performed per SEMU-60-015, paragraph 10.0. The O2 pressure port is pressurized on the DCM side to 1065-1115 psia and a leakage rate requirement of 1.0 scc/min. O2 max is verified. REF EC 163402-592. Certification: Certified for a useful life of 15 years (ref. SEMU-46-006). C. Inspection - Air-Lock Inc. mechanically inspects all parts to ensure they meet B/P dimensions and visually inspects for surface finish and defects that might cause a leakage path. D. Failure History - H-EMU-330-D002 (4/27/90) - Excessive external leakage of DCM-side MWC O2 port due to cracks in the teflon impregnated hardcoat at the O-rings sealing surface. Leakage was initially masked by braycote lubrication which effectively provided a fluid seal at the O2 port O-rings until the braycote deteriorated over time. Per Call Task LSS-139, the O2 housing material was changed to Nitronic 60 to eliminate the hardcoat in new builds. REF EC 163402-454-001. H-EMU-330-D003 (2/27/91) - The DCM-side MWC O2 port exhibited excessive external leakage (Act: 1169 scc/hr O2; Spec: 1 scc/hr O2) due to contamination lodged in the poppet and crazing of the teflon hardcoat. After cleaning and reassembly the MWC leaked 5 scc/hr due to the teflon hardcoat crazing. No contamination was found on the poppet. Per Call Task LSS-139, the multiple connector O2 housing material was changed to Nitronic 60, the poppet stem was changed to Nitronic 60 (stainless steel), and the hardcoat was eliminated in new builds. (Ref. H-330-D002). H-EMU-330-D004 (7/10/91) - The DCM-side MWC O2 port exhibited excessive external leakage (Act: 32.1 scc/hr O2; Spec: 1 scc/hr O2) due to crazing of the teflon

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		330FM02	SCREENS: A-FAIL B-N/A C-PASS	hardcoat. Per Call Task LSS-139, the multiple connector O2 housing material was changed to Nitronic 60, the poppet stem was changed to Nitronic 60 (stainless steel), and the hardcoat was eliminated in new builds. (Ref. H-330-D002). E. Ground Turnaround - None. Test would be invasive. F. Operational Use - Crew Response - PreEVA: When detected prior to primary O2 tank toff, trouble shoot problem, if no success, consider EMU 3 if available. EMU no go for EVA. EVA: When CWS data confirms an accelerated primary O2 use rate, terminate EVA. Training - Standard EMU training covers this failure mode. Operational Considerations - Flight rules define require EVA termination when minimum primary consumables remain. EVA Checklist procedures verify hardware integrity and systems 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-330 DCM COMMON MULTIPLE CONNECTOR
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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