

CIL  
EMU CRITICAL ITEMS LIST

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ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE												
O2 PRESSURE REGULATOR 2ND STAGE, ITEM 2130 SV799042-3 (1)	2/2	2130FM10: On/off actuator Jams open.  CAUSE: Contamination, bursts.	END ITEM: Unable to prevent flow of SOP tank oxygen to suit during airlock repressurization or suit doffing.  CREW INTERFACE: Unable to prevent loss of SOP tank pressure during airlock repressurization.  MISSION: Loss of use of one EMU, Loss of SOP pressure during airlock repressurization.  CREW/VEHICLE: Airlock may not be compatible with enriched oxygen environment. The crew compartment hatch should be opened to allow oxygen to flow into the orbiter cabin.	A. Design - Actuator push assembly slides in a nituff coated upper support and a teflon glide ring (lower support) for a more compatible sliding surface.  B. Test - Vendor Component Acceptance Test - The regulator manufacturer, Moog/Carlson, determines the force to actuate the SOP to ON during Acceptance Test to ensure that excessive force is not required. Performance tests would also detect a jammed mechanism. All exterior parts are cleaned to NS 9550 Cl.  CET POA Testing per SEMU-44-007 - All test fixtures, interfacing hoses, and test rigs that connect to either high or low pressure circuits are cleaned to NS 3150 level EM50A. The item is protected from contamination by placing a 15 micron absolute inlet filter upstream of the test item. The item undergoes shutoff feature leakage and cycling test 2 times, before and after regulator performance and endurance testing. The test consists of pressurizing the SOP bottles to 7200-7600 psig, with a Nordquist Leak Detector connected to the regulator outlet and the shutoff featured in the closed position. Leakage from outlet shall not exceed 8 cc/hr as measured for 3 minutes. Sequentially the shutoff feature is cycled for 15-25 seconds, at a flow of 5-7 lbs/hr O2 and then placing it back to the closed position for 15-25 seconds. After the cycling is complete, the item is leakage tested as per above. During POA testing, the SOP undergoes 33 minimum OFF-ON-OFF cycles and a minimum of eight fill and drain cycles, for which the item drains through the outlet. The item is flowed over the range of 0.06-0.2 lb/hr for a total of approximately 20.6 hours.  Certification Test - The item completed the following cycle tests during 5/85:  <table border="1"> <thead> <tr> <th>Mode</th> <th>Actual</th> <th>Spec</th> </tr> </thead> <tbody> <tr> <td>On/Off</td> <td>1025</td> <td>1011</td> </tr> <tr> <td>No Flow Hours</td> <td>984</td> <td>18</td> </tr> <tr> <td>Blowdown</td> <td>112</td> <td>35</td> </tr> </tbody> </table>	Mode	Actual	Spec	On/Off	1025	1011	No Flow Hours	984	18	Blowdown	112	35
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	2/2	2130FN10:		<p>No Class 1 Engineering Changes have been incorporated since the configuration was certified.</p> <p>C. Inspection - The running and final torque of all threaded connections are verified by Vendor and BCAs inspection. A trial assembly is run on all details, and then they are visually inspected.</p> <p>D. Failure History - J-EMU-213-008 (11-4-83) - Outlet pressure was high due to interference between the On/Off Actuator mechanism and the lower bellows plate. A requirement was added to insure the actuator can be depressed with the largest anticipated force and not change the outlet pressure by EC 42806-466.</p> <p>E. Ground Turnaround - Tested per FEMU-R-001 SOP Servicing for Flight, Sea Level Regulator Performance and Flow Limiting Check.</p> <p>F. Operational Use - Crew Response - Pre/PostEVA: Troubleshoot problem, if no success, consider use of third EMU if available, otherwise EMU no go for EVA. Training - Standard EMU training covers this mode. Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define EMU as lost if operational SOP is lost.</p>