

CIL
EMU CRITICAL ITEMS LIST

12/24/91 SUPERSEDES 08/31/90

ANALYST:

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NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE												
O2 PRESSURE REGULATOR 2ND STAGE, ITEM 2130 SV799042-2 (1)	2/2	2130FMDP: On/Off actuator Jawm closed. CAUSE: Contamination, burrs.	END ITEM: Plunger Jam keeping second stage closed rendering valve Inoperative. OFF INTERFACE: Unable to move O2 actuator to EVA position. Unable to activate emergency oxygen backup capability. MISSION: Loss of use of one EMU. CREW/VEHICLE: None.	A. Design - Actuator push assembly slides in a nituff coated upper support and a Nylon J glide ring (lower support) for a more compatible sliding interface in the SV799042-2 regulator. B. Test - Vendor Component Acceptance Test - The regulator manufacturer, CIL, 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 MS 1550 CI. PDA 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 MS 1190 level EN50A. The item is protected from contamination by placing a 75 micron absolute inlet filter upstream of the test item. The shutoff feature is cycled 10 times by placing it into the open position for 15-25 seconds at a flow of 3-7 ltu/hr O2 and then placing back to the closed position for 15-25 seconds. During PDA Testing the SOP undergoes 33 minimum OFF-ON-OFF cycles and a minimum of eight fill and drain cycles, of which the item drains thru the outlet. The item is flowed over the range of 0.06-0.2 ltu/hr for a total of approx. 20.6 hrs. Certification Test - The item completed the following cycle tests during 5/05: <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>986</td> <td>18</td> </tr> <tr> <td>Blowdown</td> <td>112</td> <td>35</td> </tr> </tbody> </table> No Class I Engineering Changes have been incorporated since the configuration was certified. C. Inspection - Details are 100% inspected per drawing dimensions and surface characteristics. Details are manufactured from material with certified physical and chemical properties.	Mode	Actual	Spec	On/Off	1025	1011	No flow hours	986	18	Blowdown	112	35
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2/2 2130M091

The running and final torque of all threaded connections are verified by Vendor and DCRS inspection. A trial assembly is run on all details and then they are visually inspected.

D. Failure History -

J-EMU-213-001 (2-21-81) - Outlet pressure fluctuated due to a hang-up in the On/Off Actuator Mechanism. The diameter of the arm in question was reduced by 0.018 inches to insure adequate clearance by EC 42803-72-5.
 H-EMU-213-009 (7-25-84) - Excessive force required to obtain required stroke. The vendor's test added a lever ratio that made the regulator test satisfactory when, in fact it was not acceptable. The test rig was changed to eliminate this problem.
 H-EMU-213-003 (11-21-85) - Excessive force required to obtain required stroke due to slide load inherent in the mechanism. The Spec was changed as per EC 42806-968.
 H-EMU-213-006 (5-27-87) - Excessive force required to obtain required stroke. EC 163402-233 changed the teflon actuator slide ring to Nylon J, and increased the clearance between actuator and housing to reduce frictional forces. Also revised testing procedures at vendor facilities.
 H-EMU-213-AD19(6/15/89)- Excessive force required to obtain required stroke of actuator lever due to interference with the Regulator Second Stage cap. The OP sheets have been revised to position the regulator towards the bottom of the SOP body support and to verify full stroke of the SOP.

E. Ground Turnaround -

Tested per FEMU-R-001 SOP Servicing for Flight, Sea Level Regulator Performance and Flow Limiting Check.

F. Operational Use -

Operational Use -
 Crew Response -
 PreEVA: Trouble shoot problem, if no success, consider use of third EMU if available. Otherwise EMU no go for EVA.
 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 EMU as lost if operational SOP is lost.

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