

EMU
CRITICAL ITEMS LIST
FILE: CR11/3

NAME P/N MTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
02 PRESSURE REGULATOR 1ST STAGE ITEM 215M SV778675- 15 111 4C175-1 ..	E/IR	21507M20: INTERNAL LEAKAGE, FAILS OPEN. CAUSE: CONTAMINATION, OIP SEAL DETERIORATION, BALL ACTUATOR OR RETURN PLUNGER JAMS.	END ITEM: INCREASE IN THE INTERSTAGE REGULATED PRESSURE LEVEL ABOVE 250 PSID. O/E INTERFACE: NONE FOR SINGLE FAILURE. FAILS TO LIMIT THE MAX. FLOW RATE TO 7.5 LBS/HR FOLLOWING A FAILED OPEN 1ST STAGE REGULATOR. SUIT PRESSURE REMAINS IN SPEC DUE TO 2150. MISSION: NONE FOR SINGLE FAILURE. WITH A DOUBLE FAILURE, POSSIBLE SUIT OVERPRESSURIZA- TION. CREWMEMBERS: NONE FOR SINGLE FAILURE. POSSIBLE LOSS OF CALIBRATION WITH GAS/O OPEN 1ST STAGE REGULATOR.	A. DESIGN - TWO OF THE THREE POSSIBLE HIGH PRESSURE OXYGEN LEAK PATHS ARE SEALED WITH WELDED STATION NUMBER OIP SEALS. AS PRESSURE IS APPLIED TO THESE SEALS, LOAD ON THE OIP INCREASES, DEMAND INCREASES THE SPRING LOADED SYMMETRIC BAPHIRE BALL/WASPEL SP-1 SEAT ASSEMBLY IS MINIMIZED. SINCE HIGH PRESSURE ACTS TO INCREASE THE LOAD ON THE SEAL INTERFACE, THE REGULATOR IS DESIGNED TO MAINTAIN LEVEL IN SOA TO PRECLUDE ANY RESONANT CONTAMINATION. THE FIRST STAGE REGULATOR IS PROTECTED BY A 25 MICRON ABSOLUTE NICKEL FILTER TO MINIMIZE THE CHANCE OF JAMMING. THE NOMINAL RATING OF THE FILTER IS 10 MICRON, WHICH IS EQUIVALENT TO A PARTICLE SIZE OF 0.0007 INCHES. MINOR CLEARANCE BETWEEN SLIDING PARTS IS SMALL TO MINIMIZE COCKING. IT IS 0.001-0.0015 BETWEEN THE VALVE STEM AND HOUSING AND 0.0005-0.0015 BETWEEN THE SPRING SEAT AND HOUSING. THE HOUSING IS MADE OF STRESS RELIEVED 7050 ALU AND THE VALVE STEM AND SPRING SEAT ARE MADE OF AGE HARDENED 7050 TO MINIMIZE THE CHANCE OF GALLING. ALL SLIDING SURFACES ARE FINISHED TO 32 MICROMETER FINISH. THE L/D RATIO FOR THE VALVE STEM-HOUSING COMBINATION IS 7, AND FOR THE SPRING SEAT-HOUSING COMBINATION IS 8.6 WHICH WILL MINIMIZE THE CHANCE FOR COCKING. ALL EDGES ARE EITHER RADIUSED OR CHAMFERED. B. TEST - COMPONENT ACCEPTANCE TEST - THE VENDOR, CEI, PERFORMS THE FOLLOWING TESTS TO ASSURE THE FIRST STAGE REGULATOR DOES NOT FAIL OPEN OR INTERNALLY LEAK: CONTAMINATION OR JAMMING OF THE DEMAND VALVE IS REDUCED/MINIMIZED BY CLEANING ALL OF THE REGULATOR INTERNAL DETAILS AND OXYGEN PASSAGEWAYS TO INSURED ENDS. THE TEST FACILITY HARDWARE AND GASES ALSO MEET THIS REQUIREMENT. THE REGULATOR INTERNAL LEAKAGE IS TESTED DURING ACCEPTANCE TESTING AT 4000 PSI INLET. FOR TEST - CONTAMINATION OR JAMMING OF THE DEMAND VALVE IS REDUCED/MINIMIZED BY CLEANING ALL INTERFACING INLET TEST FITTINGS AND NOSES TO INSURED ENDS. TEST GASES ARE ALSO REQUIRED TO MEET THIS REQUIREMENT. THE ITEM IS TESTED PRIOR TO AND IMMEDIATELY AFTER PMA PERFORMANCE TESTING TO VERIFY THAT THERE IS NO INTERNAL LEAKAGE. WITH THE REGULATOR INLET PRESSURIZED TO 5000- 6200 PSID, AND THE INTERSTAGE PRESSURIZED TO 270-310 PSID, THE FIRST STAGE LEAKAGE MUST NOT EXCEED 10 SCC/MIN O2.

CEL
CRITICAL ITEMS LIST
FILE: C113/1

NAME P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	QUALIFIERS FOR ACCEPTANCE
02 PRESSURE REGULATOR 1ST STAGE ITEM 2138 SV778475- 13 133 FC175-2 #	E/1R	E1307W03B1 INTERNAL LEAKAGE, FAILS OPEN.		<p>B. TEST - FOR TEST (CONTINUED) - DURING REGULATOR PERFORMANCE TESTING, THE REGULATOR INLET IS PRESSURIZED TO 7400 PSIG AND THEN 550 PSIG AT SEA LEVEL AMBIENT. THE OUTLET FLOW MUST NOT EXCEED 0.2 LBS/MIN. AFTER REGULATOR ENDURANCE TESTING, THIS TEST IS REPEATED AT BOTH SEA LEVEL AMBIENT AND VACUUM AMBIENT CONDITIONS.</p> <p>CERTIFICATION TEST - THE ITEM COMPLETED 904 NO FLOW HOURS DURING 8/WE WHICH IS FIFTY (50) TIMES THE CERTIFICATION REQUIREMENT OF 18 HOURS. THE ITEM COMPLETED 122 BLENDING CYCLES DURING 8/02 WHICH IS THREE (3) TIMES THE CYCLE CERTIFICATION REQUIREMENT OF 35. NO CLASS X ENGINEERING CHANGES HAVE BEEN INCORPORATED SINCE THIS CONFIGURATION HAS CERTIFIED.</p> <p>C. INSPECTION - ALL DETAILS, BASES AND TEST FACILITIES ARE CLEANED AND INSPECTED TO MEET EPA808 TO PRECLUDE CONTAMINATION CLOTHING. DETAILS, INCLUDING THE LIP SEAL, ARE 100% INSPECTED PER DRAWING DIMENSIONS AND SURFACE FINISH CHARACTERISTICS. THE FINISH AND FINAL TORQUE OF ALL THREADED CONNECTIONS ARE VERIFIED BY VENDOR AND DCAS INSPECTORS. A FINAL ASSEMBLY IS MADE ON ALL DETAILS AND THEN THEY ARE VISUALLY INSPECTED. THE DEMAND VALVE PIVOT IS MANUALLY DEPRESSED DURING ASSEMBLY TO ASSURE FREE MOTION.</p> <p>D. FAILURE HISTORY - HEMU-200-AD04 (7/3/80) HIGH INTERSTAGE PRESSURE DUE TO LEAKING DEMAND VALVE LIP-SEAL. DIMENSIONAL CONTROLS WERE REVISED TO PRECLUDE SEAL MISALIGNMENT AS PER EC2803-72. HEMU-215-AD03 (1/23/81) INTERNAL LEAKAGE DUE TO HIGH PRESSURE PUMP OIL CONTAMINATION, RIGS CHANGED TO PRECLUDE HIGH PRESSURE PUMP OIL CONTAMINATION.</p>

EIL
 CRITICAL ITEMS LIST
 FILE: EIL1/1

8/5/88 SUPERSEDES 4/4/1988

NAME P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
O2 PRESSURE REGULATOR 1ST STAGE ITEM 2310 SV77847B- 18 (1)	2/1R	2830FMSIN: INTERNAL LEAKAGE, FAULT OPEN.		E. GROUND TIGHTENING - TESTED FOR FAILED OPEN REGULATOR PER FEMSI-N-008, REGULATOR PERFORMANCE AND FLOW LIMITING CHECK. (SOP SERVICING FOR FLIGHT.) F. OPERATIONAL USE - CREW RESPONSE - EVA: SINCE THIS FAILURE IS NOT DETECTABLE AND EVA TERMINATION IS REQUIRED AS SOON AS SOP IS FLOWING, CREW WOULD CONTINUE TO TERMINATE EVA. SPECIAL TRAINING - STANDARD ENU TRAINING COVERS THIS FAILURE MODE. OPERATIONAL CONSIDERATIONS - EVA CHECKLIST PROCEDURES VERIFY WARDWARE INTEGRITY AND SYSTEMS OPERATIONAL STATUS PRIOR TO EVA. FLIGHT RULES DEFINE ENU AS LOST FOR LOSS OF OPERATIONAL SOP, REAL TIME DATA SYSTEM ALLOWING ENU MONITORING OF ENU SYSTEMS.

FC178-2
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