

CEL  
CRITICAL ITEMS LIST  
FILE: CELS/L

NAME P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
02 PRESSURE REGULATOR, 2ND STAGE ITEM 2130 SV778675- 11 111 FC182-1 "	2/1R	2130H05B; DRIFTS BELOW REGULATION BAND LIMITS.  CAUSE: CONTAMINATION COMPONENT SHAFTS STICK OR SPRING RELAXES OR FRACTURES, INLET FILTER CLOGS.	END ITEM: NONE.  OPE INTERFACE: NONE.  MISSION: NONE.  CREW/VEHICLE: NONE FOR SINGLE FAILURE. POSSIBLE LOSS OF CREWMAN WITH LOSS OF OLSA.	A. DESIGN - THE SECOND STAGE SPRINGS OPERATE AT A STRESS BELOW YIELD POINT. THE HELICAL REGULATING SPRING HAS A CYCLE LIFE OF 200,000 CYCLES. A CYCLE IS DEFINED AS STRESSING THE SPRING FROM ZERO TO OPERATING LOAD AND BACK. THE SPECIFICATION REQUIRES THE REGULATOR TO SURVIVE 1525 PRESSURIZATION CYCLES. THE SECOND STAGE INLET PLEATED NICKEL MESH FILTER HAS A CLEAN EFFECTIVE AREA OF 0.002 IN. THE EQUIVALENT ORIFICE AREA TO LIMIT THE DELTA P ACROSS THE FILTER TO 0.4 PSID AT PIN = 160 PSI AND A FLOW OF 5.24 LB/HR OF O2 IS 0.0049 SQ. IN. THE RATIO OF AVAILABLE AREA TO THE REQUIRED AREA FOR THE FILTER IS 26. THE SYSTEM IS CLEANED TO HES10 LEVEL EMS0A BEFORE OPERATION WHICH MINIMIZES THE INITIAL AMOUNT OF CONTAMINATION IN THE SYSTEM. PARTICLE GENERATION DURING OPERATION IS MINIMIZED BY MATERIAL SELECTION AND SURFACE FINISHES. THE SECOND STAGE REGULATOR IS PROTECTED BY A 15 MICRON ABSOLUTE NICKEL FILTER TO MINIMIZE THE CHANCE OF JAMMING. NOMINAL RATING OF THE FILTER IS 10 MICRON WHICH IS EQUIVALENT TO A PARTICLE SIZE OF .0007 INCHES. DIAOMETRICAL CLEARANCE BETWEEN SLIDING PARTS IS SMALL TO MINIMIZE COCKING. IT IS 0.0010-0.0015 BETWEEN THE DEMAND VALVE PINNLE AND HOUSING, 0.0005-0.0025 BETWEEN THE RETURN PLUNGER AND HOUSING, AND 0.0005-0.0025 BETWEEN THE STEM GUIDE AND PRESSURE BALANCE STEM. THE FILTER REDUCES THE PROBABILITY OF A PARTICLE JAMMING THESE DETAILS. THE HOUSING AND STEM GUIDE ARE MADE OF STRESS RELIEVED HONEL 400 AND THE VALVE STEM, SPRING SEAT, AND PRESSURE BALANCE STEM ARE MADE OF AGE HARDENED HONEL K500 TO MINIMIZE THE CHANCE OF GALLING. ALL SLIDING SURFACES HAVE EITHER A 16 OR 32 MICROINCH FINISH. ALL EDGES ARE EITHER RADIUSSED OR CHAMFERED. THE L/O RATIO FOR THE VALVE STEM - HOUSING COMBINATION IS 7:1 FOR THE SPRING SEAT - HOUSING COMBINATION IS 8.6:1 AND FOR THE PRESSURE BALANCE STEM - STEM GUIDE IS 7.

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02 PRESSURE REGULATOR, 2ND STAGE ITEM 2130 5V770475- 13 C11  FC102-2 N	2/3R	2130/FH50: DREIFTS BELOW REGULATION BAND LIMBS.		<p>B. TEST -          COMPONENT ACCEPTANCE TEST -          THE VENDOR, CCE, PERFORMS THE FOLLOWING TESTS TO ASSURE          THE SECOND STAGE REGULATOR DOES NOT DREIFT BELOW          3.3 PSR. CONTAMINATION IS REDUCED/MINIMIZED BY CLEANING          ALL OF THE REGULATOR INTERNAL DETAILS AND OXYGEN          PASSAGEWAYS TO NS3150 EN504. THE TEST FACILITY HARDWARE          AND GASES ALSO MEET THIS REQUIREMENT.          THE REGULATION BAND IS VERIFIED DURING ACCEPTANCE TEST BY          PERFORMANCE TESTS AT SEA LEVEL WITH AN INLET PRESSURE OF          7400 PSI AND A VARYING FLOW RATE FROM 0.04 TO 5.3 TO 0.04          PPH. THE PERFORMANCE TEST IS ALSO PERFORMED AT VACUUM          CONDITIONS WITH INLET PRESSURE OF 7400, 5055, 2710 AND 350          PSI AND A VARYING FLOW RATE FROM 0.04 TO 5.3 TO 0.06 PPH.</p> <p>PWA TEST -          CONTAMINATION OR CLOGGING OF THE INLET FILTER IS          REDUCED/MINIMIZED BY CLEANING ALL INTERFACING INLET TEST          FIXTURES AND HOSES TO NS3150 EN504. TEST GASES ALSO MEET          THIS REQUIREMENT.          PROPER REGULATOR PERFORMANCE IS VERIFIED IN A SERIES OF          PERFORMANCE AND ENDURANCE TESTS.          THE REGULATOR IS PERFORMANCE TESTED INITIALLY AT SEA LEVEL          INDIUM AT 7400 PSIG AND 350 PSIG INLET PRESSURES. AT          EACH INLET PRESSURE, THE OUTLET PRESSURE IS MONITORED OVER          THE FLOW RANGES OF 0-0.2 (LBS/HR OZ IMAX) AND 0.2 (INAK) -0          LBS/HR OZ. INITIALLY, THE END ITEM (50P) IS ALLOWED TO          BLOWDOWN FROM 7400 PSIG TO 350 PSIG MAX, WHILE VERIFYING          PROPER REGULATOR FUNCTION. WITH THE INLET AT 7400 PSIG,          THE ITEM IS ENDURANCE FLOWED AT 4.5-5.25 LBS/HR OZ FOR          5 HOURS MINIMUM AND AT 0.5-2.0 LBS/HR OZ FOR 2.5 HOURS          MINIMUM.</p>

CII  
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 FILE: C103/1

NAME P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
02 PRESSURE REGULATOR, 2ND STAGE STEM 2130 SV770475- 11 111	2/1R	2130F050: DRIFTS BELOW REGULATION BAND LIMITS.		<p>D. TEST - (CONTINUED)          AGAIN, THE END ITEM (SOP) IS ALLOWED TO BLOWDOWN FROM 7400-350 PSIG. WITH THE INLET PRESSURE AT 350 PSIG, THE ITEM IS ENDURANCE FLOWED AT 4.5-5.25 LBS/HR O2 FOR 5 HOURS MINIMUM, AND AT 0.5-2.0 LBS/HR O2 FOR 2.5 HOURS MINIMUM. AFTER THE BLOWDOWN AND ENDURANCE TESTING, THE ITEM IS PERFORMANCE TESTED AT SEA LEVEL AND VACUUM AMBIENT WITH INLET PRESSURES OF 7400 PSIG AND 350 PSIG. FOR EACH CONFIGURATION, THE OUPLET PRESSURE IS MONITORED OVER THE THE FLOW RANGES OF 0-0.2 (MAX) LBS/HR O2 (MAX) AND 0.2 (MAX) -0 LBS/HR O2. AN ADDITIONAL BLOWDOWN IS PERFORMED PRIOR TO VACUUM AMBIENT TESTING.</p> <p>CERTIFICATION TEST -          THE ITEM COMPLETED THE FOLLOWING CYCLE TESTS DURING 5/05:          ON/OFF ACTUAL 1025, SPEC 8011; NO FLOW HOURS ACTUAL 704,          SPEC 10; BLOWDOWN ACTUAL 112, SPEC 16. NO CLASS I          ENGINEERING CHANGES HAVE BEEN INCORPORATED SINCE THIS          CONFIGURATION HAS CERTIFIED.</p> <p>C. INSPECTION -          THE RUNNING AND FINAL TORQUE OF ALL THREADED CONNECTIONS          ARE VERIFIED BY VENDOR AND DCAS INSPECTORS. A TRIAL          ASSEMBLY IS RUN ON ALL DETAILS AND THEN THEY ARE VISUALLY          INSPECTED. THE BURNING VALVE FINTLE AND BALANCE STEM ARE          MANUALLY DEPRESSED DURING ASSEMBLY TO ASSURE FREE MOTION.</p>
102-3				

CEL  
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 FILE: CILS/A

NAME P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
02 PRESSURE REGULATOR, 2ND STAGE ITEM 233D SV770475- 13 (1)	2/IN	233D/MOSB: DRIFTS BELOW REGULATION BAND LIMITS.		<p>D. FAILURE HISTORY -          MEMU-215-C00312/10/00) LOW OUTLET PRESSURE DUE TO HIGH CONTAMINATION AND HIGH FILTER PRESSURE DROP. THE RIC WAS CHANGED TO TRAP ANY OLIV OIL SPILLAGE. THE OUTLET FILTER WAS REMOVED AND THE SYSTEM WAS CLEANED TO H53150 EN50A. MEMU-215-007 (8/16/04) CORROSION OBSERVED IN THE SECOND STAGE REGULATOR SEIZE CAVITY AND OUTLET FITTING FROM WATER COLLECTED DUE TO SUBSTANDARD SUBLIMATOR PERFORMANCE. A DRAIN WAS ATTACHED TO DRAIN PORT H DURING ALL WARMED CHAMBER TESTING.</p> <p>E. GROUND TURNDOWN -          TESTED PER SEMU-R-003, SOP SERVICING FOR FLIGHT SEA LEVEL REGULATOR PERFORMANCE AND FLOW LIMITING CHECK.</p> <p>F. OPERATIONAL USE -          CREW RESPONSE - EVA1 SINCE EVA TERMINATION IS REQUIRED AS SOON AS SOP IS FLOWING, CREW WOULD ABORT EVA WHEN INSUFFICIENT SOP REGULATION IS DETECTED.          SPECIAL TRAINING - STANDARD EBU TRAINING COVERS THIS 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 EBU PRESSURE INTEGRITY AND REGULATION. FLIGHT RULES DEFINE EBU AS LOST FOR LOSS OF OPERATIONAL SOP. REAL TIME DATA SYSTEM ALLOWS GROUND MONITORING OF EBU SYSTEMS.</p>
FC102-4 ..				