CIL
CRITICAL ITEMS LIST
FILE: CIC3/1

NAME P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
O2 PRESSURE REGULATOR 2ND STAGE ITEM 213D SVP78475-15 (1) FCIB1-1 M	2/1R	213DFM04B: REGULATOR BAND DRIFTS ABOVE 4.55 PSED. CAUSE: CONTAMINATION, WEAR OF BALL ACTUATOR STEM OR BALANCE BAR. BALANCE STEM OR ACTUATOR STEM STICKS, BALL SEAT DETERIORATES.	EMS ITEM: USE OF SOP OXYGEN RATHER THAN PLSS OXYGEN TO MAINTAIN EMU PRESSURE. CPE INTERFACE: HIGH PRESSURE CAUSES ITEM 14G POSITIVE PRESSURE RELIEF VALVE TO OPEN, RESULTING IN RAPID DEPLETION OF SOP SUPPLY. PLSS IS STILL OPERATIONAL. MISSION: TERMINATE EVA WHEN EMS ISSUES A LOW SOP PRESSURE WARNING. CREW/VEHICLE: NONE FOR SINGLE FAILURE. POSSIBLE LOSS OF CREWMAN WITH LOSS OF PLSS.	A. DESIGN - A CHANGE IN THE POSITION OF THE BALL IN THE SEAT DOES NOT SIGNIFICANTLY AFFECT REGULATION. A 0.005 INCH CHANGE IN BALL SEAT POSITION CHANGES THE REGULATED PRESSURE 0.1 PSI. VESPEL IS A CREEP RESISTANT MATERIAL. THE SYSTEM IS CLEANED TO MSSISO LEVEL EMSOA BEFORE OPERATION WHICH MINIMIZES THE AMOUNT OF CONTAMINATION INITIALLY IN THE SYSTEM. PARTICLE GENERATION DURING OPERATION IS MINIMIZED BY MATERIAL SELECTION AND SURFACE FINISHES. THE SECOND STAGE REGULATOR IS PROTECTED BY A 25 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 0.0007 INCHES. GEOMETRICAL CLEARANCE BETWEEN SLIDING PAIRS IS SMALL TO MINIMIZE COCKING. IT IS 0.0010-0.0015 BETWEEN THE VALVE STEM AND HOUSING, 0.0005-0.0025 BETWEEN THE SPRING SEAT 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 CLOSE TOLERANCES. THE HOUSING AND STEM GUIDE ARE MADE OF STRESS RELIEVED MONEL 400, AND THE VALVE STEM SPRING SEAT, AND PRESSURE BALANCE STEM ARE MADE OF AGE HARDENED MONEL K 500 TO MINIMIZE THE CHANCE OF GALLING. ALL SLIDING SURFACES HAVE EITHER A 16 OR 32 MICROINCH FINISH, ALL EDGES ARE EITHER RADIUSED OR CHAMFERED. THE L/D RATIO FOR THE VALVE STEM - HOUSING COMBINATION IS 7: FOR THE SPRING SEAT - HOUSING COMBINATION IS 1.4: AND FOR THE PRESSURE BALANCE STEM - STEM GUIDE IS 7. B. TEST - COMPONENT ACCEPTANCE TEST - THE VENDOR, CTI, PERFORMS THE FOLLOWING TESTS TO ASSURE THE SECOND STAGE REGULATOR RESPONSE HAS NOT DRIFTED. CONTAMINATION OR CLOGGING OF THE INLET FILTER IS REDUCED/MINIMIZED BY CLEANING ALL OF THE REGULATOR INTERNAL DETAILS AND OXYGEN PASSAGEWAYS TO MSSISO EMSOA. THE TEST FACILITY HARDWARE AND GASES ALSO MEET THIS REQUIREMENT. THE REGULATOR PRESSURE AND FLOW CAPABILITY ARE VERIFIED DURING ACCEPTANCE TEST BY PERFORMANCE TESTS AT SEA LEVEL WITH AN INLET PRESSURE OF 7400 PSI AND A VARYING FLOW RATE FROM 0.06 TO 5.3 TO 0.06 PPH. THE PERFORMANCE TEST IS ALSO PERFORMED AT VACUUM CONDITIONS WITH INLET PRESSURES OF 7400, 5055, 2710, AND 350 PSI AND A VARYING FLOW RATE FROM 0.0 TO 5.5 TO 0.06 PPH. PDA TEST - CONTAMINATION OR CLOGGING OF THE INLET FILTER IS REDUCED/MINIMIZED BY CLEANING ALL INTERFACING INLET TEST FIXTURES AND HOSES TO MSSISO EMSOA. TEST GASES ALSO MEET THIS REQUIREMENT. PROPER REGULATOR PERFORMANCE IS VERIFIED IN A SERIES OF PERFORMANCE AND ENDURANCE TESTS.

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02 PRESSURE REGULATOR 2ND STAGE ITEM 2150 SV77B475-33 (1)	2/IR	2130FM06B(REGULATOR BAND DRIFTS ABOVE 6.65 PSIB.		B. TEST - (CONTINUED) THE REGULATOR IS PERFORMANCE TESTED INITIALLY AT SEA LEVEL AMBIENT 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 02 (MIN.) AND 0.2 (MIN.) -0 LBS./HR 02. INITIALLY THE SOP IS ALLOWED TO BLOWDOWN FROM 7400 PSIG TO 350 PSIG, WHILE VERIFYING PROPER REGULATOR FUNCTION. WITH THE INLET AT 7400 PSIG, THE ITEM IS ENDURANCE FLOWED AT 4.5-5.25 LBS/HR 02 FOR 5 HOURS MINIMUM AND AT 0.5-2.0 LBS/HR 02 FOR 2.5 HOURS MINIMUM. AGAIN, THE END ITEM (SOP) IS ALLOWED TO BLOWDOWN FROM 7400 TO 350 PSIG. WITH THE INLET PRESSURE AT 350 PSIG, THE ITEM IS ENDURANCE FLOWED AT 4.5-5.25 LBS/HR 02 FOR 5 HOURS MINIMUM, AND AT 0.5-2.0 LBS/HR 02 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 OUTLET PRESSURE IS MONITORED OVER THE FLOW RANGES OF 0-0.2 LBS/HR 02 (MAX) AND 0.2 (MIN) -0 LBS/HR. 02. AN ADDITIONAL BLOWDOWN IS PERFORMED PRIOR TO VACUUM AMBIENT TESTING. CERTIFICATION TESTING - THE ITEM COMPLETED THE FOLLOWING CYCLE TESTS DURING S/051 ON/OFF ACTUAL 1025, SPEC 1000; NO FLOW HOURS ACTUAL 904, SPEC 10; BLOWDOWN ACTUAL 112, SPEC 55. NO CLASS I ENGINEERING CHANGES HAVE BEEN CHANGED SINCE THIS CONFIGURATION WAS CERTIFIED. C. INSPECTION - DETAILS ARE 100% INSPECTED PER DRAWING DIMENSIONS AND SURFACE FINISH CHARACTERISTICS. DETAILS ARE MANUFACTURED FROM MATERIAL WITH CERTIFIED PHYSICAL AND CHEMICAL PROPERTIES. ALL DETAILS, CASES, AND TEST FACILITIES ARE CLEANED AND INSPECTED TO MIL-STD-1150 EMCH TO PRECLUDE CONTAMINATION CLOGGING. THE BALL SEAT IS VISUALLY INSPECTED UNDER 30X MAGNIFICATION FOR SHARP EDGES AND SURFACE DEFECTS. THE MINIMUM AND FINAL TORQUE OF ALL THREADED CONNECTIONS ARE VERIFIED BY VENDOR AND DCAS INSPECTORS. A TRIAL ASSEMBLY IS MADE OF ALL DETAILS AND THEY ARE VISUALLY INSPECTED. THE DEMAND VALVE PINTLE AND BALANCE STEM ARE MANUALLY DEPRESSED DURING ASSEMBLY TO ASSURE FREE MOTION. D. FAILURE HISTORY - NONE. E. GROUND TURNAROUND - TESTED PER FEMU-R-001; SOP SERVICING FOR FLIGHT, SEA LEVEL REGULATOR PERFORMANCE AND FLOW LIMITERS CHECK.

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III

CEL
CRITICAL ITEMS LIST
FILE: CILS/1

NAME P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
02 PRESSURE REGULATOR 2ND STAGE EFEN 2150 SV778475-13 (1) FCR01-3 M	2/BR	2150EH04B; REGULATOR BAND DRIFTS ABOVE 4.55 PSID.		F. OPERATIONAL USE - CREW RESPONSE - EVA; SINCE EVA TERMINATION IS REQUIRED AS SOON AS SOP IS FLOWING, CREW WOULD ABORT EVA WHEN EXCESSIVE SOP REGULATION IS DETECTED. SPECIAL 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 GO/NO GO CRITERIA RELATED TO EMU PRESSURE INTEGRITY AND REGULATION. FLIGHT RULES DEFINE EMU AS MOST FOR LOSS OF OPERATIONAL SOP. REAL TIME DATA SYSTEM ALLOWS GROUND MONITORING OF EMU SYSTEMS.

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