CRITICAL ITEMS LIST
FILE: CIL-PLSS/2

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
FAN/SEPAR- ATOR/ PUMP/MOTOR ASSEMBLY ITEM 125 SV787094-0 (1) EC67-1 0	2/1R	125(MOD): EXTERNAL GAS LEAKAGE, VENTILATION CIRCUIT. CAUSE: SEAL FAILURE.	END ITEM: SUIT GAS LEAKAGE TO AMBIENT. OPF INTERFACE: EXCESSIVE CONSUMPTION OF THE PRIMARY OXYGEN SUPPLY. THE SOP IS AUTOMATICALLY ACTIVATED DURING EVA IF THE SUIT PRESSURE DROPS TO 3.35 PSID. MISSION: TERMINATE EVA. LOSS OF USE OF ONE EMU. CREW/VEHICLE: NONE FOR SINGLE FAILURE. POSSIBLE LOSS OF CREWMAN WITH LOSS OF SOP.	A. DESIGN - THE UNIT HAS FIVE EXTERNAL LEAKAGE PATHS THROUGH RADIAL "O" RING SEALS (1 SILICONE, 1 FLUOROSILICONE, 3 VITON) AND A LEAKAGE PATH THROUGH A FACE TYPE, O-RING SEAL (VITON) CONFIGURATION DIMENSIONS AND HARDNESS OF ASSEMBLY PROVIDE SQUEEZE UNDER ALL BOUNDING CONDITIONS. OPERATING FLUID TEMPERATURE AND PRESSURE IS NOT EXTREME. VENT LOOP GAS IS AT 4.3 PSID. B. TEST - *CERTIFICATION TEST - THE ITEM COMPLETED 10,000 HOURS OF OPERATION AND 8400 ON/OFF CYCLES EXCEEDING THE 15 YEAR CERTIFICATION REQUIREMENT BY MORE THAN A FACTOR OF THREE. THE 15 YEAR STRUCTURAL VIBRATION, ELECTRICAL VIBRATION, ELECTRICAL VIBRATION AND DESIGN SHOCK WAS COMPLETED 12/84. THE FOLLOWING ENGINEERING CHANGES HAVE BEEN INCORPORATED AND CERTIFIED SINCE THIS CONFIGURATION WAS CERTIFIED: 42006-342-55 (CHANGE POWER CONSUMPTION REQUIREMENT - MORE AMPS), 42006-406 (INCORPORATE NITRONIC 60 RETAINING NUT), 42006-424 (SEAL CUP CHANGE TO ASSURE A GOOD WELD), 42006-810 (WATER PUMP CHANGES FOR INSPECTION IN AREAS THAT ARE SUSCEPTIBLE TO CONTAMINATION, MORE BREAK EDGES AND DEBURRING OPERATIONS 42006-934 (CHANGE BEARING LIMITED LIFE REQUIREMENTS). *COMPONENT ACCEPTANCE TESTS - THE VENT CIRCUIT IS REVERSE FLOW PRESSURE TESTED, BY EVACUATING IT TO 0.2 PSIA MAX IN SEA LEVEL AMBIENT CONDITIONS (P = 14.5 MIN), FOR 5 MINUTES. THE VENT CIRCUIT IS THEN PRESSURIZED TO 25.7-25.7 PSIA FOR 5 MINS. SEQUENTIALLY THE ITEM IS HELIUM LEAKAGE TESTED BY PRESSURIZING THE ITEM (VENT CIRCUIT) TO 4.0-5.0 PSIA HE IN CHAMBER VACUUM. THE LEAKAGE MUST NOT EXCEED 4.5 X 10-8 SCC/SEC. HE. *SEE POA TESTING PER SEMU-60-010 - THE ITEM (PLSS) VENT CIRCUIT IS PRESSURIZED TO 8.25-8.45 PSIG FOR 5 MINUTES. SEQUENTIALLY A SYSTEM EXTERNAL LEAKAGE TEST IS PERFORMED. THE VENT CIRCUIT IS PRESSURIZED TO 18.9-19.1 PSIA. LEAKAGE MUST NOT EXCEED 4.44 SCC/MIN O2.

SEMU-60-010
Page 721

CIL
CRITICAL ITEMS LIST
FILE: CIL-PLSS/2

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
FAN/SEPAR- ATOR/ PUMP/MOTOR ASSEMBLY ITEM 123 SV767794-0 (1) FC67-2 0	2/1R	123FM03: EXTERNAL GAS LEAKAGE, VENTILATION CIRCUIT.		C. INSPECTION - THE BEARING CARRIER O-SEAL GROOVE IS 100% INSPECTED FOR DIMENSIONAL AND SURFACE FINISH REQUIREMENTS AFTER MACHINING. THE STATOR SLEEVE ID WHICH MATES UP WITH BEARING CARRIER O-SEAL IS 100% INSPECTED FOR SURFACE FINISH REQUIREMENTS AFTER MACHINING. THE MOTOR HOUSING ID WHICH MATES UP WITH THE STATOR SLEEVE'S O-SEAL IS 100% INSPECTED FOR SURFACE FINISH REQUIREMENTS AT RECEIVING INSPECTION. THE MOTOR HOUSING ID WHICH MATES UP WITH THE STATOR SLEEVE'S O-SEAL IS 100% INSPECTED FOR SURFACE FINISH REQUIREMENTS AFTER MACHINING AND REWORKING TO ACCEPT THE STATOR SLEEVE FOR CANNED MOTOR RETROFITS. VOLUTE HOUSING BORE WHICH MATES TO MOTOR HOUSING O-SEAL IS INSPECTED FOR DIAMETER AND SURFACE FINISH. MOTOR HOUSING TO VOLUTE HOUSING O-SEAL GROOVE IS 100% INSPECTED FOR DIMENSIONS AND SURFACE FINISH. VOLUTE HOUSING FACE SEAL O-SEAL GROOVE (WHICH MATES WITH VALVE MODULE) IS 100% INSPECTED FOR DIMENSIONS AND SURFACE FINISH. VALVE MODULE BORE FOR ITEM 125 MOTOR IS 100% INSPECTED FOR BOTH DIMENSION AND FACE SEAL SURFACE FINISH. ALL O-SEALS ARE INSPECTED FOR SURFACE CHARACTERISTICS PER SVHS3432, 100% FOR CLASS I AND II O-SEALS, AND AT LEAST 1.5 AQL FOR CLASS III. O-SEAL ON VOLUTE TO MOTOR HOUSING INTERFACE IS ASSEMBLED WITH BRAYCOTE LUBRICANT WITH AN OPERATION SHEET NOTE STATING "HANDLE PREFORMED PACKING (O-SEAL) WITH CARE. DO NOT OVERSTRETCH, NICK OR CUT DURING ASSEMBLY".

CIL
CRITICAL ITEMS LIST
FILE: CIL-PLSS/8

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
FAN/SEPAR-ATOR/ PUMP/MOTOR ASSEMBLY EIEH 123 SV787896-8 41)	R/1R	123FM03; EXTERNAL LEAKAGE, VENTILATION CIRCUIT.		C. INSPECTION - (CONTINUED) *SV747776 MOTOR HOUSING - THE MOTOR HOUSING ID WHICH MATES UP WITH THE STATOR SLEEVE'S O-SEAL IS 100% INSPECTED FOR SURFACE FINISH REQUIREMENTS AT RECEIVING INSPECTION. *SV787967-100 MOTOR HOUSING - THE MOTOR HOUSING ID WHICH MATES UP WITH THE STATOR SLEEVE'S O-SEAL IS 100% INSPECTED FOR SURFACE FINISH REQUIREMENTS AFTER MACHINING AND RONDPOWDING TO ACCEPT THE STATOR SLEEVE FOR CANNED MOTOR RETROFITS. *MISCELLANEOUS - VOLUTE HOUSING BORE WHICH MATES TO MOTOR HOUSING O-SEAL IS INSPECTED FOR DIAMETER AND SURFACE FINISH. MOTOR HOUSING TO VOLUTE HOUSING O-SEAL GROOVE IS 100% INSPECTED FOR DIMENSIONS AND SURFACE FINISH. VOLUTE HOUSING FACE SEAL O-SEAL GROOVE (WHICH MATES WITH VALVE HOUSING) IS 100% INSPECTED FOR DIMENSIONS AND SURFACE FINISH. VALVE HOUSING BORE FOR EIEH 123 MOTOR IS 100% INSPECTED FOR BOTH BOREDEPTH AND FACE SEAL SURFACE FINISH. ALL O-SEALS ARE INSPECTED FOR SURFACE CHARACTERISTICS PER SVR33432, 100% FOR CLASS I AND II O-SEALS, AND AT LEAST 1.6 AQL AND 2.5 AQL FOR CLASS IIE AND IV O-SEALS RESPECTIVELY. O-SEAL ON VOLUTE TO MOTOR HOUSING INTERFACE IS ASSEMBLED WITH BRAYCOTE LUBRICANT WITH AN OPERATION SHEET NOTE STATING "HANDLE PREFORMED PACKING (O-SEAL) WITH CARE. DO NOT OVERSTRETCH, NICK OR CUT DURING ASSEMBLY."
EC67-1 4				

NAME P/N QTY	CREW	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
FAN/SEPAR-ATOR/ PUMP/MOTOR ASSEMBLY ITEM 123 SV789194-0 (1)	2/10	TESTING; EXTERNAL LEAKAGE, VENTILATION CIRCUIT.		B. FAILURE HISTORY - M-EMU-100-A007 (7-25-85) GAS LEAK AT TRANSFER TUBE BETWEEN THE MUFFLER AND THE FAN/PUMP/ SEPARATOR OUTLET CAUSED BY DAMAGED O-SEAL DURING ASSEMBLY. A CAUTION NOTE WAS ADDED TO THE OPERATION SHEETS TO ENSURE THE ALIGNMENT OF THE TRANSFER TUBE PRIOR TO AND DURING INSTALLATION OF THE FAN/PUMP/SEPARATOR. REVISION A OF OPERATION SHEET SV789288-11-02, OP 40 INCORPORATES THIS NOTE. YELLOW TAG NOTICE 1070 ISSUED TO THE FIELD TO ENSURE FIELD CONCURRENCE. M-EMU-121-D0115-A-888 GAS LEAK AT VOLUTE HOUSING AND MOTOR HOUSING INTERFACE CAUSED BY RAISED MATERIAL IN THE O-SEAL GROOVE. RAISED MATERIAL WAS CAUSED BY A MACHINING PROCESS DURING RETROFIT TO "CANNED" MOTOR CONFIGURATION. CORRECTIVE ACTION; OP SHEETS WERE REVISED AND A PROCEDURE WAS INCORPORATED TO PROTECT O-SEAL GROOVE SURFACE. E. GROUND TURNAROUND - TESTED PER PEMU-A-001 FOR STRUCTURAL AND LEAKAGE. F. OPERATIONAL USE - CREW RESPONSE PREEVA: WHEN DETECTED PRIOR TO PRIMARY O2 TANK TOPOFF, TROUBLE SHOOT PROBLEM. IF NO SUCCESS, CONSIDER EMU 9 IF AVAILABLE. EMU 10 GO FOR EVA. EVA: WHEN EMU DATA CONFIRMS AN ACCELERATED PRIMARY O2 USE RATE, TERMINATE EVA. TRAINING - STANDARD EMU TRAINING COVERS THIS FAILURE MODE. OPERATIONAL CONSIDERATIONS - FLIGHT RULES DEFINE REQUIRE EVA TERMINATION WHEN NOMINAL PRIMARY CONSUMABLES REMAIN. EVA CHECKLIST PROCEDURES VERIFY HARDWARE INTEGRITY AND SYSTEMS OPERATION STATUS PRIOR TO EVA. REAL TIME DATA SYSTEM ALLOWS GROUND MONITORING OF EMU SYSTEMS.
FC63-4 0				