SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : LIFE SUPPORT FMEA NO 06-2C -0442 -2 REV:09/28/8

ASSEMBLY : URINE COLLECTION EQUIPMENT CRIT. FUNC: 2
P/N RI : MC282-0069 CRIT. HDW: 3
P/N VENDOR: 47E225362, 47C265888 VEHICLE 102 103 104
QUANTITY : 2 EFFECTIVITY: X X X
: ONE PER LOOP PHASE(S): PL LO OO X DO LS
:

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY:		APPROVED BY:	APPROVED BY (NASA):
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ITEM:
LINES, FITTINGS AND COMPONENTS, FAN/SEPARATORS TO SECOND CHECK VALVES

FUNCTION:
PROVIDES FLOW PATH FOR WASTE WATER FROM EACH FAN/SEPARATOR PITOT TUBE T
EACH SECOND CHECK VALVE SO THAT WASTE WATER CAN BE TRANSFERRED TO WASTE
TANK.

FAILURE MODE:
EXTERNAL LEAKAGE

CAUSE(S):
CORROSION, SEAL DEGRADATION, VIBRATION, MECHANICAL SHOCK, POROSITY

EFFECT(S) ON:
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE

(A, B) WASTE WATER WOULD LEAK INTO WCS ENCLOSURE, POSSIBLY SHORTING OUT FAN/SEPARATOR MOTOR.

(C) DEGRADED MISSION - UNPLEASANT ODOR AND FREE WASTE WATER IN CABIN.

(D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - LOSS OF WASTE COLLECTION CAPABILITY (SECOND FAILURE - LOSS OF REDUNDANT LINES AND FITTINGS) MAY CAUSE EARLY MISSION TERMINATION.
REDUNDANCY SCREEN B FAILS BECAUSE EXTERNAL LEAKAGE OF LINES, FITTINGS AND COMPONENTS CAN NOT BE DETECTED IN FLIGHT, VISUALLY OR BY INSTRUMENTATION.

DISPOSITION & RATIONALE:
(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A) DESIGN
THE PITOT TUBE MATERIAL IS TITANIUM, WITH A WELDED CONNECTING FITTING, SEALED WITH A STATIC VITON O-RING. THE URINE OUTPUT FITTINGS ARE DYNATUBES, TORQUED TO SPECIFICATIONS AND SAFETY WIRED. THE OUTLET HOSE ASSEMBLY IS A RESISTOFLEX FLEX HOSE FROM THE PITOT TUBE TO CHECK VALVES

CONSTRUCTED OF TEFLON TUBING WITH AN OUTER PROTECTIVE CRES BRAID WITH DYNATUBE FITTINGS ON EITHER END. TEST PORT IS A DYNATUBE AND CAP, SAFETY WIRED.

(B) TEST
QUALIFICATION TESTS FOR 100 MISSION LIFE - RANDOM VIBRATION, 48 MINUTES/AXIS, RATE OF PLUS 6 dB/OCTAVE FROM 20 TO 150 HZ; CONSTANT AT 0.03 G SQ/HZ FROM 150 TO 1000 HZ; DECREASING AT THE RATE OF MINUS 6 dB/OCTAVE FROM 1000 TO 2000 HZ. SINUSOIDAL VIBRATION SWEEPS 5 TO 35 HZ AT 1 OCTAVE/MINUTE AT 0.25 G PEAK. SHOCK TESTING OF 20 G SAWTOOTH SHOCK IMPULSE, 11 MILLISECOND DURATION.

ACCEPTANCE TEST - SEPARATOR COMPONENTS AND OUTLET HOSE ASSEMBLY ARE LEAK TESTED AT 32.0 PSIG (20.7 PSIG OPERATING REQUIREMENT).

OMRSD: SEPARATOR COMPONENTS AND OUTLET HOSE ASSEMBLY ARE LEAK CHECKED AT NORMAL OPERATING CONDITIONS PRIOR TO EACH FLIGHT AT VENDOR. FAN/SEPARATOR URINE OUTPUT LINE IS LEAK TESTED AT 32.0 PSIG PRIOR TO EACH FLIGHT AT VENDOR.

(C) INSPECTION

RECEIVING INSPECTION
CERTIFICATION OF ALL RAW MATERIALS AND PROCESSES IS VERIFIED.

ASSEMBLY/INSTALLATION
CORROSION PROTECTION PROVISIONS AND TORQUING IS VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION
VISUAL INSPECTION OF O-RING SURFACES. DYE PENETRANT INSPECTION OF HOUSING WELDS AND PITOT TUBE. X-RAY INSPECTION OF LINE/OUTLET AND ALL PRESSURE LINES.

TESTING
ACCEPTANCE TEST PROCEDURE IS VERIFIED AND WITNESSED BY QUALITY CONTROL.

(D) FAILURE HISTORY
NO FAILURES.

(E) OPERATIONAL USE
IF FAILURE DOES OCCUR, SWITCH TO OTHER FAN/SEPARATOR. CREW CAN REMOVE FRONT PANEL OF WCS AND PERFORM THE FREE WATER DISPOSAL PROCEDURE.