SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : LIFE SUPPORT FMEA NO 06-2C -0401 -4 REV:09/28/8

ASSEMBLY : VENT AND DUMP EQUIPMENT CRIT. FUNC: 1
P/N RI : MC282-0069 CRIT. HDW:
P/N VENDOR: 47D264875 VEHICLE 102 103 104
QUANTITY : 1 EFFECTIVITY: X X X
: PHASE(S): PL LO X OO X DO X LS
: ONE PER SUBSYSTEM

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

PREPARED BY:
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ITEM:
VALVE, MANUAL SHUTOFF, VACUUM CONTROL

FUNCTION:
PROVIDES FOR THE APPLICATION OF VACUUM TO THE FECAL COLLECTION COMMODE FOR SUBLIMATION OF THE WATER FROM THE FECAL MATTER FOR VENTING OVERBOARD. ALLOWS CONTROLLED VENTING FROM THE WET TRASH COMPARTMENTS. BACKS UP THE COMMODE OUTLET VALVE AND THE SLIDE VALVE TO PREVENT CABIN AIR LOSS DUE TO LEAKAGE IN THE SYSTEM.

FAILURE MODE:
EXTERNAL LEAKAGE

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

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

(A) FUNCTIONAL DEGRADATION - CABIN AIR WILL VENT OVERBOARD UNTIL CORRECTIVE ACTION.

(B) DEGRADED INTERFACES - INCREASED USAGE OF CABIN ATMOSPHERE CONSUMABLES. AFTER CORRECTIVE ACTION, PRESSURE MAY BUILD IN VACUUM VE LINE RESULTING IN INABILITY TO APPLY VACUUM TO COMMODE. LOSS OF VACUU TO HYDROGEN SEPARATOR.

(C) LOSS OF CABIN ATMOSPHERE MAY CAUSE EARLY MISSION TERMINATION.

(D) NO EFFECT FOR FIRST FAILURE.

(E) FUNCTIONAL CRITICALITY EFFECT - FAILURE TO ISOLATE LEAK (VACUUM VENT ISOLATION VALVE FAILURE - SECOND FAILURE) WILL RESULT IN UNCONTROLLED LOSS OF CABIN ATMOSPHERE AND MAY RESULT IN LOSS OF CREW/VEHICLE.

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

(A) DESIGN
CONSTRUCTED OF STAINLESS STEEL SHAFT WITH ANODIZED 6061-T6 ALUMINUM

HOUSING. BALL IS HARD ANODIZED ALUMINUM. TEFLON VALVE SEATS AND VITON O-RINGS. FLANGE CONNECTIONS HAVE SELF LOCKING INSERTS. ALL MATERIALS ARE COMPATIBLE WITH WORKING FLUID (MOIST AIR).

(B) TEST
QUALIFICATION TESTS FOR 100 MISSION LIFE - SUBJECTED TO RANDOM VIBRATION, 48 MINUTES PER AXIS AT THE 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 TEST OF 20 G SAWTOOTH SHOCK PULSE - 11 MILLISECOND DURATION. A 210 MAN-DAY FUNCTIONAL TEST PERFORMED WITH HUMAN TEST SUBJECTS AND ACTUAL WASTES. LEAK TESTS WERE PERFORMED BEFORE AND AFTER.

ACCEPTANCE TEST - FUNCTIONAL PERFORMANCE AND LEAKAGE INTEGRITY. (LESS THAN 0.0985 LB/DAY)

OMRSD: VALVE IS VERIFIED FOR LESS THAN SPEC LEAKAGE PRIOR TO EACH FLIGHT.

(C) INSPECTION

RECEIVING INSPECTION
CERTIFICATION OF RAW MATERIALS AND PROCESSES ARE VERIFIED.

ASSEMBLY/INSTALLATION
VISUAL INSPECTION FOR CONTAMINATION AND DAMAGE IS VERIFIED. CORROSION PROTECTION PRIOR TO INSTALLATION AND TORQUING OF FLANGE BOLTS IS VERIFIED BY INSPECTION.

TESTING
LEAK AND FUNCTIONAL INTEGRITY DURING ATP IS WITNESSED AND VERIFIED.

HANDLING/PACKAGING
PARTS ARE VERIFIED FOR PROTECTION, HANDLING AND PACKAGING REQUIREMENTS TO PREVENT ABUSE.

(D) FAILURE HISTORY
NO FAILURES.

(E) OPERATIONAL USE
THE CREW WOULD PERFORM THE LOSS OF CABIN PRESSURE PROCEDURE, WHICH IS PART OF NORMAL CREW TRAINING.