SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ATMOSPHERIC REVIT. FMEA NO 06-1A -1601 -1 REV:07/08/88

ASSEMBLY :AIRLOCK
P/N RI :MC250-0004-0012
P/N VENDOR:2763-0001-9
QUANTITY :2
:TWO ON INNER HATCH
:

CRIT. FUNC: 1R
CRIT. HDW: 2

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X

PHASE(S): PL LO OO X DO LS

REDUNDANCY SCREEN: A-PASS B-N/A C-PASS

PREPARED BY:
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ITEM:
EQUALIZATION VALVE, CABIN/AIRLOCK HATCH

FUNCTION:
PROVIDES FOR EQUALIZING PRESSURE ACROSS THE INNER HATCH. EACH VALVE OPERATES INDEPENDENTLY WITH POSITIVE DETENTS AT TWO FLOW POSITIONS. VALVE CAN BE ACTUATED FROM EITHER SIDE OF HATCH.

FAILURE MODE:
INABILITY TO OPEN, RESTRICTED FLOW

CAUSE(S):
VIBRATION, MECHANICAL SHOCK, CORROSION, CONTAMINATION, PHYSICAL BINDING/JAMMING

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

(A,B) LOSS OF ONE REDUNDANT VALVE TO REPRESSURIZE AIRLOCK.

(C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - SECOND ASSOCIATED FAILURE (LOSS OF OTHER EQUALIZATION VALVE) COULD RESULT IN LOSS OF EVA CREWMEN. SCREEN 'B' IS N/A BECAUSE REDUNDANT VALVE IS STANDBY.

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

(A) DESIGN
UNIT IS FLANGE MOUNTED WITH A SINGLE SILASTIC-675 SILICONE RUBBER O-RING WHICH COMPENSATES FOR ROUGHNESS OF FLANGE PREVENTING EXTERNAL LEAKAGE. HOUSING IS FABRICATED OF A356.0-T61 ALUMINUM ALLOY.

(B) TEST

QUALIFICATION TESTS FOR 100 MISSION LIFE: ACCELERATION OF 5 G FOR FIV MINUTES PER AXIS. SINUSOIDAL VIBRATION - 5 TO 35 HZ AT +/- 0.25 G PEA PER AXIS. RANDOM VIBRATION - 0.09 G^2/HZ FOR 48 MINUTES PER AXIS DESIGN SHOCK - 20 G PER AXIS. THERMAL VACUUM/THERMAL CYCLE - WITH VALV CLOSED AND CAP ON, UNIT EXPOSED TO 120 TO 130 F AND VACUUM OF 1 X 10 TORR FOR 24 HOURS. LOW/HIGH TEMPERATURE CYCLE - HELD AT -40 TO -50 F FO 3 HOURS AND AT +120 TO 130 F FOR 3 HOURS. OPERATING LIFE - OPERATI OFF/NORMAL/EMERGENCY POSITIONS WITH 15 PSIG APPLIED FOR 800 CYCLES LEAKAGE MONITORED DURING OR AFTER THESE TESTS LIMITED TO 5 SCCM MAX.

ACCEPTANCE TEST - PROOF PRESSURE 25 PSIG GN2, WITH VALVE OPEN AND CLOSEI LEAK CHECK AT 15 PSIG, 5 SCCM MAX - VALVE OPEN AND CLOSED AND REVERS LEAKAGE.

OMRSD - AIRLOCK VALVES OPENING AND CLOSING TORQUES VERIFIED EVERY TI FLIGHTS. CONTINGENCY TEST AT 15 PSIG AFTER LRU REPLACEMENT AI CONTINGENCY TEST AT 3.2 PSID IN VEHICLE. GROSS LEAKAGE TEST AT 2 PSI BEFORE EACH FLIGHT.

(C) INSPECTION

RECEIVING INSPECTION

MATERIALS VERIFIED AT RECEIVING INSPECTION. ALUMINUM HOUSING CASTING ARE HYDROSTATIC PROOF PRESSURE TESTED AT 32 PSID.

CONTAMINATION CONTROL

CORROSION PROTECTION PROVISIONS AND CONTAMINATION CONTROL PLAN VERIFIE BY INSPECTION. CLEANLINESS LEVELS OF 200A AND 100 ML RINSE TEST VERIFIED.

ASSEMBLY/INSTALLATION

MANUFACTURING PROCESSES, INSTALLATION AND ASSEMBLY VERIFIED B INSPECTION. TORQUES VERIFIED BY INSPECTION. DIMENSIONAL CHECK PERFORMED BY INSPECTION. INSPECTION PERFORMS MIPS FOR CONCENTRICITY AND PERPENDICULARITY.

NONDESTRUCTIVE EVALUATION

ALUMINUM HOUSING CASTINGS ARE X-RAYED AND DYE PENETRANT INSPECTED T DETECT CRACKS, VERIFIED BY INSPECTION.

CRITICAL PROCESSES

PASSIVATED PARTS AND HEAT TREATMENT VERIFIED BY INSPECTION. MECHANICA SOLDERING OF DEBRIS SCREEN VERIFIED BY INSPECTION. ANODIZATION O ALUMINUM PARTS VERIFIED BY INSPECTION.

TESTING

ATP VERIFIED BY INSPECTION.

HANDLING/PACKAGING

PARTS PROTECTION VERIFIED BY INSPECTION.

(D) FAILURE HISTORY
NO FAILURE HISTORY.

(E) OPERATIONAL USE
CREW WILL USE THE REDUNDANT VALVE FOR REPRESSURIZATION OF AIRLOCK.