SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ATMOSPHERIC REVIT. FMEA NO 06-1B -0536 -1 REV:09/07/8

ASSEMBLY :WATER PUMP
P/N RI :MC621-0008-0455/56
P/N VENDOR:SV755543-4,5,6 HAM STD
QUANTITY :12
:SIX PER LOOP
:

CRIT. FUNC: 1F
CRIT. HDW: 2

| VEHICLE EFFECTIVITY: | 102 | 103 | 104 |
|---|---|---|---|
| | X | X | X |

PHASE(S): PL LO X OO X DO X LS

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

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ITEM:
DISCONNECT, SELF SEALING
PUMP PACKAGE - INLET, OUTLET, AND BYPASS

FUNCTION:
PROVIDES THE ATTACHMENT POINTS FOR THE WATER COOLANT PUMP ASSEMBLY TO T WATER COOLANT LOOP AND THE BYPASS CIRCUIT SO THAT THE COOLANT PUMP ASSEMBLY CAN BE REMOVED AND REPLACED AS AN LRU.

FAILURE MODE:
EXTERNAL LEAKAGE

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

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

(A) LOSS OF REDUNDANCY - LOSS OF ONE WATER COOLANT LOOP.

(B) LOSS OF COOLING OF AFFECTED WATER COOLANT LOOP. FREE WATER IN CABI

(C) POSSIBLE EARLY MISSION TERMINATION FOR LOSS OF ONE WATER COOLANT LOOP.

(D) POTENTIAL LOSS OF CREW/VEHICLE UPON SUBSEQUENT LOSS OF REDUNDANT WATER COOLANT LOOP.

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

(A) DESIGN
MADE OF 17-4 PH STAINLESS STEEL. ALL ITEMS ARE SELF SEALING COUPLINGS STAINLESS STEEL WITH ELASTOMERIC SEALS. AN EXTERNAL SEAL IS ENGAGED BEFORE THE VALVE POPPET IS UNSEALED FOR FLOW.

(B) TEST
ACCEPTANCE TEST - EXTERNAL LEAKAGE OF 0.001 CC/HR MAX AT 90 PSIG. PROO PRESSURE OF 135 PSIG FOR 5 MINUTES, BURST PRESSURE OF 180 PSID FOR 5 MINUTES, AND COLLAPSE PRESSURE OF 22.5 PSID.

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QUALIFICATION TEST - LEAKAGE OF 0.001 CC/HR MAXIMUM AT 90 PSIG. PRE PRESSURE OF 135 PSIG, BURST OF 180 PSIG AND COLLAPSE OF 22.5 PSI SUBJECTED TO RANDOM VIBRATION SPECTRUM ENVELOPE OF 20 TO 150 INCREASING AT 6 DB/OCTAVE TO 0.03 G**2/HZ, CONSTANT AT 0.03 G**2/HZ FR 150 TO 1000 HZ, DECREASING AT 6 DB/OCTAVE FROM 1000 TO 2000 HZ FOR MINUTES PER AXIS IN THREE ORTHOGONAL AXES. DESIGN SHOCK - THREE TERMI SAWTOOTH PULSES OF 20 G PEAK AMPLITUDE AND 11 MS DURATION APPLIED IN BO DIRECTIONS ALONG EACH OF THREE ORTHOGONAL AXES.

IN-VEHICLE TESTING - SYSTEM DECAY TEST IS PERFORMED AT 85 - 95 PSIG. CC/MIN MAX LEAKAGE. PUMP OUT PRESSURE AND ACCUMULATOR QUANTITY A CONTINUOUSLY MONITORED WHEN THE VEHICLE IS POWERED UP AND SERVE AS INDICATION OF EXTERNAL LEAKAGE.

OMRSD - PUMP ACCUMULATOR QUANTITY AND OUTLET PRESSURE ARE CONTINUOUS MONITORED WHILE THE VEHICLE IS POWERED UP DURING EACH TURNAROUND, A SERVE AS AN INDICATION OF EXTERNAL LEAKAGE. WATER IS SAMPLED PER SP SE-S-0073 DURING SERVICING.

(C) INSPECTION

RECEIVING INSPECTION
RAW MATERIALS ARE VERIFIED FOR MATERIAL AND PROCESS CERTIFICATION.

CONTAMINATION CONTROL
EXTERNAL AND INTERNAL SURFACE CLEANLINESS IS MAINTAINED AND VERIFIED ACCORDANCE WITH H.S. REQUIREMENTS. INSPECTION VERIFIES CORROSI PROTECTION PROVISIONS.

ASSEMBLY/INSTALLATION
ORIENTATION OF CONNECTOR MASTER KEYWAY IS DETERMINED AND VERIFIED INSPECTION. TORQUE APPLICATION IS VERIFIED PER DRAWING REQUIREMEN KOROPON TREATED SURFACE OVERCOATED WITH POLYURETHANE IS VERIFIED INSPECTION. PARTS ARE INSPECTED VISUALLY AND IN-PROCESS INSPECTION IMPLEMENTED. IN-PROCESS LEAK CHECK PERFORMANCE IS VERIFIED FOR TUBE WE INTEGRITY.

CRITICAL PROCESSES
WELDING OF FILTER HOUSING TO PUMP INLET FLANGES IS VERIFIED INSPECTION.

TESTING
ATP IS VERIFIED BY INSPECTION.

HANDLING/PACKAGING
PACKAGING AND STORAGE REQUIREMENTS ARE VERIFIED BY INSPECTION.

(D) FAILURE HISTORY
NO FAILURE HISTORY APPLICABLE TO EXTERNAL LEAKAGE FAILURE MODE. TH DISCONNECT HAS SUCCESSFULLY PERFORMED WITHOUT FAILURE THROUGH TH DURATION OF THE SHUTTLE PROGRAM.

(E) OPERATIONAL USE
TBS.