

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ACTIVE THERMAL CONTROL FMEA NO 06-3C -0102 -1 REV:08/23/88

ASSEMBLY : FREON PUMP ASSEMBLY CRIT. FUNC: 13
 P/N RI : MC250-0001-0436 CRIT. HDW: 2
 P/N VENDOR: SV764016 VEHICLE 102 103 104
 QUANTITY : 2 EFFECTIVITY: X X X
 : ONE PER LOOP PHASE(S): PL LO X OO X DO X LS

REUNDANCY SCREEN: A-PASS B-PASS C-PASS
 PREPARED BY: DES O. TRAN *O. Tran* APPROVED BY: DES *Michael James Fuller* APPROVED BY (NASA): *[Signature]*
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ITEM:
 FILTER, PUMP PACKAGE INLET.

FUNCTION:
 THE PUMP PACKAGE INLET FILTER PROTECTS THE PUMP AND CHECK VALVE SCREEN FILTERS FROM SYSTEM CONTAMINATION.

FAILURE MODE:
 RESTRICTED FLOW.

CAUSE(S):
 CONTAMINATION, MECHANICAL SHOCK, CORROSION.

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
 (A) REDUCED FLOW RATE IN ONE FREON COOLANT LOOP MAY RESULT IN PUMP CAVITATION AND LOSS OF ONE FREON COOLANT LOOP.
 (B) LOSS OF ONE FREON LOOP FOR VEHICLE COOLING.
 (C) POSSIBLE LOSS OF MISSION. EARLY MISSION TERMINATION MAY BE REQUIRE: FOR FIRST FAILURE.
 (D) SECOND ASSOCIATED FAILURE (LOSS OF REDUNDANT FREON COOLANT LOOP) WILL CAUSE LOSS OF ALL VEHICLE COOLING WHICH MAY RESULT IN LOSS OF CREW/VEHICLE.

DISPOSITION & RATIONALE:
 (A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE
 (A) DESIGN
 DESIGN SAFETY FEATURE - FILTERS SIZED TO PRECLUDE CLOGGING. FILTER IS : MICRON ABSOLUTE AND 10 MICRON NOMINAL AT 98% FILTRATION. FILTER IS CAPABLE OF WITHSTANDING A 96 PSID PRESSURE DIFFERENTIAL IN THE DIRECTION OF FLOW WITHOUT FAILURE VERSUS 76 PSID MAXIMUM PUMP DIFFERENTIAL PRESSURE. MATERIAL USED IS STAINLESS STEEL WHICH IS COMPATIBLE WITH FREON 21.

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(B) TEST

QUALIFICATION TEST - PUMP PACKAGE QUALIFICATION TESTED FOR 100 MISSION LIFE. PUMP PACKAGE VIBRATION TESTED AT 0.023 G²/HZ FOR 84 MIN/AXIS, SHOCK TESTED AT +/- 20 G EACH AXIS.

ACCEPTANCE TEST - PRESSURE DROP CHECK OF FILTER PRIOR TO INSTALLATION INTO PUMP PACKAGE. FUNCTIONAL CHECK OF PUMP PACKAGE DURING ATP WILL VERIFY FLOW AND PUMP PACKAGE DELTA PRESSURE.

CMRSD - PRE- AND POST-FLIGHT CHECKOUT USING PUMP PRESSURE MEASUREMENT TO DETECT FAILURE. FREON CHEMICAL ANALYSIS PER SE-S-0073 DURING SERVICING. VEHICLE FREON IS SERVICED THROUGH 10 MICRON (ABS) GSE FILTER.

(C) INSPECTION

RECEIVING INSPECTION

RAW MATERIAL AND PURCHASED COMPONENT REQUIREMENTS ARE VERIFIED BY INSPECTION. MANUFACTURING PROCESSES, INCLUDING PARTS PROTECTION, REQUIREMENTS ARE VERIFIED BY INSPECTION.

CONTAMINATION CONTROL

CONTAMINATION CONTROL PROCESSES AND CORROSION PROTECTION PROVISIONS ARE VERIFIED BY INSPECTION. ULTRASONIC CLEANING PROCESS IS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

MANUFACTURING, INSTALLATION, AND ASSEMBLY OPERATIONS ARE VERIFIED BY INSPECTION.

CRITICAL PROCESSES

PASSIVATION AND WELDING VERIFIED BY INSPECTION.

TESTING

ATP IS VERIFIED BY INSPECTION.

HANDLING/PACKAGING

HANDLING, PACKAGING, AND STORAGE REQUIREMENTS ARE VERIFIED BY INSPECTION

(D) FAILURE HISTORY

NO FAILURE HISTORY.

(E) OPERATIONAL USE

ON-BOARD ALARM, FREON FLOW WILL PROVIDE INDICATION OF HARDWARE FAILURE. FREON PUMP WILL BE TURNED OFF AND LOSS OF ONE FREON LOOP POWERDOWN WILL BE PERFORMED. ENTRY AT NEXT PRIMARY LANDING SITE.