

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ACTIVE THERMAL CONTROL FMEA NO 06-1C -0102 - 2 REV: 02/09/83

ASSEMBLY : FREON PUMP ASSY	CRIT. FUNC: 1
P/N RI : MC250-0001-0436	CRIT. HDW:
P/N VENDOR: SV764110	VEHICLE 102 103 104
QUANTITY : 2	EFFECTIVITY: X X X
: ONE PER LOOP	PHASE(S): PL LO X OO X DO X LS

REDUNDANCY SCREEN: A-FAIL B-FAIL C-PAS.

PREPARED BY:	APPROVED BY:	APPROVED BY. (NASA):
DES O. TRAN (NT) DES	<i>[Signature]</i>	SSM <i>[Signature]</i> 4/15/83
REL D. RISING REL	<i>[Signature]</i>	REL <i>[Signature]</i> 4/15/83
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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:
 TEAR OR OPENING IN FILTER ELEMENT (LOSS OF FILTRATION).

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

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

(A) LOSS OF PUMP PACKAGE FILTRATION.

(B) POSSIBLE PLUGGING OF PUMP INLET FILTERS WHICH CAN RESULT IN LOSS OF ONE COOLANT LOOP.

(C, D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - LOSS OF FREON 21 FLOW (PLUGGING OF TWO ASSOCIATED PUMP INLET FILTERS AND LOSS OF REDUNDANT FREON COOLANT LOOP) CAN CAUSE LOSS OF ALL VEHICLE COOLING AND CAN RESULT IN LOSS OF CREW/VEHICLE. REDUNDANCY SCREENS 'A' AND 'B' FAIL BECAUSE FILTER CAN NOT BE VISUALLY INSPECTED ON THE GROUND OR IN FLIGHT AND LOSS OF FILTRATION CAUSES NO IMMEDIATE CHANGE IN ANY FREON COOLANT LOOP PARAMETER.

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

(A) DESIGN
 FILTER IS 25 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. FREON CHEMICAL ANALYSIS PER SE-S-0073 DURING SERVICING.

(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

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 APPLICABLE FAILURE HISTORY.

(E) OPERATIONAL USE

ON-BOARD ALARM FOR LOW FREON FLOW WILL PROVIDE INDICATION OF THE DOWN-STREAM PUMP INLET FILTERS CLOGGING. SWITCH TO THE REDUNDANT PUMP. IF LOSS OF BOTH PUMPS OCCURS, PERFORM "LOSS OF ONE FREON LOOP POWERDOWN" AND DEORBIT AT THE NEXT PRIMARY LANDING SITE.