

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ACTIVE THERMAL CONTROL FMEA NO 06-3C -0305 -3 REV:08/29
 ASSEMBLY : FREON THERMAL LOOP CRIT. FUNC:
 P/N RI : MC250-0015-1205 CRIT. HW:
 P/N VENDOR: RR42860 VEHICLE 102 103 104
 QUANTITY : 2 EFFECTIVITY: X X X
 : TWO PER VEHICLE PHASE(S): FL LO OO OO 25
 :

REUNDANCY SCREEN: A- B- C-
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES O. TRAN *O.T.* DES *[Signature]* SSM *[Signature]*
 REL D. RISING *D.R.* REL *[Signature]* REL *[Signature]*
 QE W. SMITH *W.S.* QE *[Signature]* QE *[Signature]*

ITEM:
 CONNECTOR, FLUID/GSE HEAT EXCHANGER.

FUNCTION:
 PROVIDES CONNECTION FOR GROUND COOLING OF VEHICLE FREON. ALSO FUNCTIONS AS A RELIEF VALVE DURING FLIGHT.

FAILURE MODE:
 RESTRICTED FLOW, GSE FREON 114.

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

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
 (A) POSSIBLE LOSS OF FLOW IN THE GSE FREON 114 LOOP.
 (B) LOSS OF GSE COOLING CAPABILITY.
 (C) POSSIBLE LOSS OF MISSION. LOSS OF PAYLOAD POSTLANDING COOLING.
 (D) NO EFFECT.

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

(A) DESIGN
 THE HEAT EXCHANGER, CONNECTOR, AND THE INTEGRAL RELIEF VALVE PARTS ARE MADE OF STAINLESS STEEL AND THE SEALS IN THE RELIEF VALVE ARE TEFLON. THESE MATERIALS ARE COMPATIBLE WITH FREON 114.

(B) TEST
 QUALIFICATION TEST - THE HEAT EXCHANGER AND CONNECTOR ARE QUALIFIED AND TESTED FOR 100 MISSION LIFE. VIBRATION TESTED AT 0.3 G²/HZ FOR 52 MIN/AXIS, SHOCK TESTED AT +/- 20 G EACH AXIS IN QUALIFICATION TEST FOR 100 MISSION LIFE.

ACCEPTANCE TEST - PRESSURE DROP TEST WILL VERIFY FLOW RATE DURING AT7.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ACTIVE THERMAL CONTROL FMEA NO 06-3C -0105 -3 REV:08/25

OMRSD - GSE FREON 114 LOOP IS SERVICED THROUGH A 50 MICRON GSE FILTER. GSE LOOP FLOWRATE IS VERIFIED PRIOR TO EACH FLIGHT. FREON CHEMICAL ANALYSIS PER 52-S-0073 DURING SERVICING.

(C) INSPECTION

RECEIVING INSPECTION

RAW MATERIAL AND PROCESS CERTIFICATIONS ARE VERIFIED BY INSPECTION. INSPECTION VERIFIES PART PROTECTION. INSPECTION VERIFIES MATERIAL AND EQUIPMENT CONFORM TO SPECIFICATION.

CONTAMINATION CONTROL

SYSTEM FLUID SAMPLE ANALYZED FOR CONTAMINATION. CORROSION PROTECTION PROVISIONS ARE VERIFIED BY INSPECTION. CLEANLINESS (LEVEL 300) IS VERIFIED BY INSPECTION BEFORE AND AFTER ATP. ULTRASONIC CLEANING OF COMPONENTS IS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

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

CRITICAL PROCESSES

HEAT TREATMENT, WELDING AND PASSIVATION ARE VERIFIED BY INSPECTION.

TESTING

FUNCTIONAL TEST IS MONITORED FOR LEAKAGE BY INSPECTION.

HANDLING/PACKAGING

PROPER HANDLING AND STORAGE ENVIRONMENTS ARE VERIFIED BY INSPECTION.

(D) FAILURE HISTORY

NO FAILURE HISTORY.

(E) OPERATIONAL USE

FAILURE IS INDICATED BY ELEVATED EVAPORATOR OUT TEMPERATURE. IF COOLING CANNOT BE REGAINED, THE ORBITER WILL BE POWERED DOWN. POSSIBLE LOSS OF PAYLOADS WHICH REQUIRE ORBITER COOLING.