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PRINT DATE: 10/19/88

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-3D-0502-X

SUBSYSTEM NAME: ATCS - RADIATORS AND FLOW CONTROL

REVISION : 10/19/88

CLASSIFICATION	NAME	PART NUMBER
LRU :	FLOW CONTROL ASSY, RADIATOR	224-00050
LRU :	FLOW CONTROL ASSY, RADIATOR	MC203-0002-0050

QUANTITY OF LIKE ITEMS: 2
TWO, ONE PER LOOP

DESCRIPTION/FUNCTION:
VALVE, RADIATOR FLOW CONTROL.

CONTROLS FREON COOLANT TEMPERATURE FROM THE RADIATOR PANEL ASSEMBLY.
CONTROL IS ACCOMPLISHED BY MIXING HOT FREON WITH COLD RADIATOR FREON.

06-3D-10

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ACTIVE THERMAL CONTROL FMEA NO 06-3D -0502 -5 REV:08/19/88
 ASSEMBLY : RADIATOR & FLOW CONTROL CRIT. FUNC: 11
 P/N RI : MC203-0002-0050 CRIT. HDW:
 P/N VENDOR: 201-00050 VEHICLE 102 103 104
 QUANTITY : 2 EFFECTIVITY: X X X
 : TWO PHASE(S): PL L0 X 00 X DC X LS
 : ONE PER LOOP

REUNDANCY SCREEN: A-PASS B-PASS C-PAS.
 PREPARED BY: DES O. TRAN DES APPROVED BY: SSM
 REL D. RISING REL APPROVED BY (NASA):
 QE W. SMITH QE

ITEM:
 VALVE, RADIATOR FLOW CONTROL.

FUNCTION:
 CONTROLS FREON COOLANT TEMPERATURE FROM THE RADIATOR PANEL ASSEMBLY.
 CONTROL IS ACCOMPLISHED BY MIXING HOT FREON WITH COLD RADIATOR FREON.

FAILURE MODE:
 EXTERNAL LEAKAGE.

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

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

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

(A) DESIGN
 THE RADIATOR FLOW CONTROL VALVE (RFCV) IS A 3-PORT ELECTRIC MOTOR DRIVEN FLOW MODULATING VALVE. THE RFCV DESIGN CONSISTS OF A DOUBLE POPPET TYPE VALVE HEAD, EACH HEAD HAVING A TEFLON SEALING RING WHICH SEALS AGAINST A CHAMFER SEAT WITHIN THE VALVE BODY. MATERIALS ARE STAINLESS STEEL AND TEFLON, WHICH ARE COMPATIBLE WITH FREON 21. THE FLOW CONTROL ASSEMBLY IS MOUNTED ON VIBRATION ISOLATORS.

(B) TEST
 QUALIFICATION TEST - FLOW CONTROL ASSEMBLY IS QUALIFIED FOR A 100 MISSION LIFE. VIBRATION TESTED AT 0.1 G²/HZ FOR 48 MIN/AXIS AND SHOCK TESTED -/ 20 G EACH AXIS.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ACTIVE THERMAL CONTROL FMEA NO 06-3D -0502 -5 REV:08/29/8

ACCEPTANCE TEST - VALVE FUNCTIONAL TEST IS PERFORMED DURING ATP. AVT DONE AT THE COMPONENT LEVEL AND AT THE HIGHER ASSEMBLY LEVEL (FLOW CONTROL ASSEMBLY). DIELECTRIC STRENGTH TEST WAS PERFORMED.

OMRSD - FCL'S ARE LEAK CHECKED PRIOR TO EACH FLIGHT. RADIATOR FLOW CONTROLLER CHECKOUT (MANUAL AND AUTO) EVERY FIVE FLIGHTS. FREON CHEMICAL ANALYSIS PER SE-6-0073 DURING SERVICING.

(C) INSPECTION

RECEIVING INSPECTION

RAW MATERIAL CERTIFICATIONS ARE VERIFIED BY INSPECTION. PART PROTECTION IS VERIFIED BY INSPECTION.

CONTAMINATION CONTROL

CONTAMINATION CONTROL PROCESSES, CONTAMINATION CONTROL PLAN AND CORROSION PROTECTION PROVISIONS ARE VERIFIED BY INSPECTION. FLUID SYSTEM IS VERIFIED BY INSPECTION TO BE FREE OF CONTAMINATION.

ASSEMBLY/INSTALLATION

MANUFACTURING, INSTALLATION AND ASSEMBLY ARE VERIFIED BY INSPECTION FOR CRITICAL DIMENSIONS.

CRITICAL PROCESSES

WELDING IS VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION

X-RAY EXAMINATION OF FUSION WELDS IS VERIFIED BY INSPECTION.

TESTING

VIBRATION, FLOW RATE AND PRESSURE DROP REQUIREMENTS ARE VERIFIED BY INSPECTION DURING ATP. INSPECTION VERIFIES TORQUE TEST ON VALVE WHILE UNIT UNDER PRESSURE.

HANDLING/PACKAGING

HANDLING AND STORAGE ENVIRONMENTS ARE VERIFIED BY INSPECTION.

(D) FAILURE HISTORY

NO FAILURE HISTORY.

(E) OPERATIONAL USE

ON-BOARD ALARMS, FREON INLET PRESSURE AND ACCUMULATOR QUANTITY, 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.