

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - ATCS/RPCA FMEA NO 05-6WC-1012 -2 REV:06/10/88  
ASSEMBLY : MID POWER CONTROL ASSY 1,2,3 CRIT. FUNC: 1R  
P/N RI : MC477-0261-0002 CRIT. HDW: 3  
P/N VENDOR: VEHICLE 102 103 104  
QUANTITY : 4 (FOUR) EFFECTIVITY: X X X  
: ONE PER PHASE(S): PL LO OO X DO X LS  
: CONTROLLER

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS  
PREPARED BY: J BROWN APPROVED BY: DES J Brown APPROVED BY (NASA): SSM J. Whitton  
REL M HOVE REL M. J. Brown 6-10-91 REL JPB 6/10/91  
QE J COURSEN QE J. J. Courson 6/21/91 QE J. J. Courson 6/21/91  
REL J. J. Courson 6/21/91  
6/25/91

ITEM:  
HYBRID DRIVER CONTROLLER, TYPE I. RADIATOR BYPASS VALVE.

FUNCTION:  
PROVIDES POWER TO ACTIVATE MANUAL BYPASS VALVE CONTROL. 40V76A25AR46,  
AR47, 40V76A26AR38, 40V76A27AR23.

FAILURE MODE:  
INADVERTENT OUTPUT, FAILS "ON", FAILS TO TURN "OFF"

USE(S):  
PIECE PART FAILURE, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS,  
PROCESSING ANOMALY, CONTAMINATION

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

(A,B) LOSS OF ONE REDUNDANT AUTO CONTROL OF ONE RADIATOR BYPASS VALVE  
MOTOR FOR THE ASSOCIATED FREON LOOP.

(C,D) NO EFFECTS.

(E) FUNCTIONAL CRITICALITY EFFECT - LOSS OF ALL RADIATOR UNDER TEMP  
PROTECTION CAN FREEZE INTERCHANGER AND CAN RESULT IN LOSS OF ORBITER  
COOLING AND IN LOSS OF CREW/VEHICLE. WITH LOSS OF FIRST PATH, THREE  
PATHS REMAIN FOR RADIATOR TEMP CONTROL:

- 1) "RAD CONTROLLER" SWITCH FAILING OPEN FOR THE ASSOCIATED LOOP.
- 2) "RAD CONTROLLER BYPASS VALVE MAN SEL" SWITCH FAILING OPEN FOR  
THE ASSOCIATED LOOP.
- 3) LOSS OF REDUNDANT FREON COOLANT LOOP.

SCREEN B FAILS BECAUSE FAILING ONE OF TWO HYBRID DRIVERS CANNOT BE  
DETECTED SINCE REDUNDANT DRIVER WILL AUTOMATICALLY PROVIDE CONTROL.

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DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A,B,C,D)

REFER TO APPENDIX B, ITEM 1 - HYBRID DRIVER.

(B) GROUND TURNAROUND TEST

MANUAL RADIATOR BYPASS DRIVERS ARE VERIFIED EVERY FIVE FLIGHTS.

(E) OPERATIONAL USE

NONE FOR FIRST FAILURE, REDUNDANT BYPASS VALVE CONTROL WILL PERFORM FUNCTION.

05-6WC-13