

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS FMEA NO 05-6L -2004 -1 REV:10/30/87

ASSEMBLY : PANEL 08  
 P/N RI : ME451-0009-1001 CRIT. FUNC: 1R  
 P/N VENDOR: CRIT. HDW: 3  
 QUANTITY : 4 VEHICLE 102 103 104  
 EFFECTIVITY: X X X  
 PHASE(S): PL LO X OO X DO X LS  
 :FOUR  
 :(TWO PER POD)

PREPARED BY: DES D SOVEREIGN APPROVED BY: REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS  
 REL F DEFENSOR DES D. J. R. Brown APPROVED BY (NASA):  
 QE J COURSEN REL Paul Mahan (11-12-87) SSM John Harris, Ken Huffer  
 QE Dr. [Signature] REL Scott [Signature] 12997 QE [Signature]  
 EPD&C SSM Air Clamps For W. a. Stage

ITEM:  
 FUSE (1 AMP), LEFT AND RIGHT OMS - FUEL CROSSFEED VALVE A AND B (51V43LV471, 473, 52V43LV571, 573) MANUAL CONTROL.

FUNCTION:  
 CONDUCTS MANUAL CONTROL POWER AND PROVIDES CIRCUIT PROTECTION FOR THE FUEL CROSSFEED VALVES OMS CONTROL CIRCUITS. VALVE A; LEFT - 33V73A8F17. RIGHT - 33V73A8F18. VALVE B; LEFT - 33V73A8F30. RIGHT - 33V73A8F31.

FAILURE MODE:  
 OPENS, INADVERTENTLY OPENS.

CAUSE(S):  
 CHEMICAL DEGRADATION, VIBRATION, THERMAL STRESS, MECHANICAL SHOCK.

EFFECT(S) ON:  
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY  
 (A) LOSS OF REDUNDANCY FOR MANUAL CAPABILITY TO OPEN ONE OXIDIZER/FUEL PAIR OF CROSSFEED VALVES; LOSS OF CAPABILITY FOR MANUAL CLOSE OF ONE OXIDIZER/FUEL PAIR OF CROSSFEED VALVES.  
 (B) THE AFFECTED VALVE CIRCUIT CANNOT BE COMMANDED CLOSED FROM THE CONSOLE MOUNTED SWITCH. NO EFFECT DURING ABORT DUMPS SINCE THE PRIME CONTROL MODE IS THROUGH MDM COMMANDS. DURING ABORTS, GENERAL PURPOSE COMPUTER (GPC) SOFTWARE IS THE PRIMARY CONTROL WITH THE MANUAL SWITCH USED FOR BACK UP. ON ORBIT, NO GPC SOFTWARE IS PROVIDED ALTHOUGH THE CAPABILITY EXISTS LEAVING THE SWITCH AS THE ONLY CONTROL. FIRST FAILURE HAS NO EFFECT FOR OPEN; OMS TANK ISOLATION AND OMS OR RCS CROSSFEED VALVES CAN BE USED FOR SYSTEM ISOLATION. GPC COMMANDS MAY BE USED TO CLOSE THE VALVE BY MEMORY READ/WRITE PROCEDURE.  
 (C,D) NO EFFECT.

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(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF CONTROL OF ELECTRICAL POWER NECESSARY FOR THE OPERATION OF CROSSFEED VALVES. REQUIRES FOUR OTHER FAILURES (FUSE FAILS OPEN ON REDUNDANT CIRCUIT, LOSS OF GENERAL PURPOSE COMPUTER (GPC) COMMAND PATH TO VALVE, PARALLEL CROSSFEED VALVE FAILED CLOSED, LOSS OF OTHER OMS ENGINE) BEFORE THE EFFECT IS MANIFESTED. FAILURE IS NOT DETECTABLE IN FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS.

DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE

FOR DISPOSITION AND RATIONALE - REFER TO APPENDIX D, ITEM NO. 2 - FUSE, AXIAL LEAD CARTRIDGE.

(B) GROUND TURNAROUND TEST

V43CAO.070 - REDUNDANT CIRCUIT VERIFICATION (PERIODIC) - ORB/POD; PERFORMED FOR FIRST FLIGHT AND AT FIVE FLIGHT INTERVALS OR FOR LRU RETEST PER FIGURE V43Z00.000 OR FOR ORBITER DISRUPTED COPPER PATHS. FUNCTIONAL CHECKOUT OF AC MOTOR VALVE CONTROL CIRCUITS PER FIGURE V43CAO.070-2.

V43CAO.072 - REDUNDANT CIRCUIT VERIFICATION; PERFORMED EACH FLIGHT (AFTER FIRST FLIGHT). FUNCTIONAL CHECKOUT OF AC MOTOR VALVE CONTROL CIRCUITS PER FIGURE V43CAO.070-2.

V43CFO.010 - PROPELLANT SERVICING TO FLIGHT LOAD; PERFORMED EACH FLIGHT. ALL AC MOTOR VALVES CYCLED DURING LOADING OPERATION.

(E) OPERATIONAL USE

NO ACTION FOR FIRST FAILURE SINCE IT MAY NOT BE DETECTABLE. FOR SECOND FAILURE ON SAME SWITCH, USE REDUNDANT VALVE.