

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS

FMEA NO 05-6L -2028 -3

REV:10/30/87

ASSEMBLY : PANEL 08  
P/N RI : ME452-0102-7206  
P/N VENDOR:  
QUANTITY : 4  
: FOUR  
: (TWO FOR EACH POD)

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL X LO X CO X DO X LS X		

CRIT. FUNC: 1R  
CRIT. HDW: 3

PREPARED BY:  
DES D SOVEREIGN  
REL F DEFENSOR  
QE J COURSEN

REDUNDANCY SCREEN:  
APPROVED BY:  
DES *D. J. R. B...*  
REL *D. J. R. B...*  
QE *D. J. R. B...*

A-PASS B-FAIL C-PASS  
APPROVED BY (NASA):  
SSM *John Ferris for #4*  
REL *John Ferris for #4*  
QE *John Ferris for #4*  
EPDC SSM *John Ferris for #4*

ITEM:

SWITCH, TOGGLE, 2 POLES, 3 POSITIONS (OPEN, GPC, CLOSE), LEFT AND RIGHT OMS CROSSFEED VALVE A AND B.

FUNCTION:

PROVIDES THE CREW THE CAPABILITY TO CHOOSE GENERAL PURPOSE COMPUTER (GPC) CONTROL OF THE LEFT AND RIGHT OMS CROSSFEED VALVES A AND B OR TO OPEN OR CLOSE THE VALVES MANUALLY THROUGH THE PANEL SWITCH OPERATION. 33V73A8S26, S27, S28, S29.

FAILURE MODE:

INADVERTENTLY TRANSFERS TO OPEN, PREMATURE TRANSFER TO OPEN, FAILED IN THE "OPEN" POSITION (BOTH CONTACT SETS).

CAUSE(S):

CONTAMINATION, MECHANICAL SHOCK, VIBRATION, PIECE PART STRUCTURAL FAILURE.

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

(A) OVERRIDES EXISTING GENERAL PURPOSE COMPUTER (GPC) COMMAND DURING ASCENT IF DIFFERENT AND ENERGIZES ASSOCIATED CIRCUIT RELAYS. LOSS OF REDUNDANCY.

(B) IF SWITCH FAILS IN THE "OPEN" POSITION, ASSOCIATED CROSSFEED VALVE IS ENERGIZED OPEN.

(C) FIRST FAILURE HAS NO EFFECT.

(D) FIRST FAILURE HAS NO EFFECT.

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(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO CONTINUOUS MOTOR OPERATION IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. DECOMPOSITION AND POTENTIAL FOR IGNITION EXISTS. REQUIRES TWO OTHER FAILURES (INHIBIT DIODE OF THE SERIES RELAY FAILS OPEN, BELLOWS LEAK) BEFORE THE EFFECT IS MANIFESTED. FAILURE IS NOT READILY DETECTABLE IN FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS. BELLOWS LEAK NOT DETECTABLE IN FLIGHT.

DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

(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.

V43CBO.165 - AC MOTOR VALVE ACTUATOR SNIFF CHECK; PERFORMED EACH FLIGHT. ALL AC MOTOR VALVE ACTUATORS CHECKED FOR PRESENCE OF PROPELLANT VAPORS.

(E) OPERATIONAL USE

NO ACTION FOR FIRST FAILURE - NO EFFECT. FOR SUBSEQUENT DIODE FAILURE CAUSING CONTINUOUS POWER, REMOVE POWER FROM THE RELAY BY PULLING APPROPRIATE CIRCUIT BREAKERS. CIRCUIT BREAKERS WILL BE RESET WHEN VALVES ARE TO BE MOVED AND DURING TIME CRITICAL CONFIGURATION RESPONSE PERIODS.