

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2657 -1 REV:05/03/88

ASSEMBLY :PANEL MA73C
P/N RI :ME452-0102-7101
P/N VENDOR:
QUANTITY :3
:THREE
:

CRIT.FUNC: 1R
CRIT. HDW: 2

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

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS

PREPARED BY:
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ITEM:

SWITCH, TOGGLE, SP2P - FORWARD MCA 1, 2, 3 MAIN DC BUS A, B AND C
"ON/OFF" CONTROL

FUNCTION:

PROVIDES THE "ON/OFF" MANUAL CAPABILITY TO CONTROL DC BUSES A, B AND C INPUTS TO THE FORWARD MOTOR CONTROL ASSEMBLIES (MCA'S) 1, 2, AND 3 FOR CONTROL OF REACTION CONTROL SYSTEM ISOLATION MOTOR VALVES AND VENT DOOR, AIR DATA PROBE DEPLOY AND STAR TRACKER DOOR MOTORS, ATMOSPHERIC REVITALIZATION SYSTEM H2O LOOP 1 PUMPS A AND B AND GSE CONTROL OF AVIONICS BAY FANS. 85V73A129S1, S5 AND S11

FAILURE MODE:

FAILS OPEN, PREMATURELY OPENS, SHORTS TO GROUND

CAUSE(S):

PIECE PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, PROCESSING ANOMALY

EFFECT(S) ON:

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

(A) LOSS OF MAIN DC BUS RELAY LOGIC POWER INPUT TO THE ASSOCIATED FORWARD MOTOR CONTROL ASSEMBLY.

(B) LOSS OF INTERFACE REDUNDANCY. NO EFFECT FOR FIRST FAILURE. FOR THE FORWARD RCS, CAPABILITY TO OPERATE THE ISOLATION VALVES CONTROLLED BY THE ASSOCIATED FORWARD MOTOR CONTROL ASSEMBLY IS LOST; HOWEVER, REDUNDANT VALVES ARE PROVIDED FOR REQUIRED ISOLATION FUNCTIONS. FOR VENT DOOR, AIR DATA PROBE AND STAR TRACKER FUNCTIONS, THE REDUNDANT MOTOR CONTROLLED BY A DIFFERENT SWITCH COMPLETES THE FUNCTION.

(C,D) FIRST FAILURE - NO EFFECT.

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EFFECT(S) ON (CONTINUED):

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE VIA THE
FOLLOWING SCENARIO:

- (1) LEAK IN FORWARD RCS MANIFOLD 2 DURING EARLY ASCENT PHASE
NECESSITATING CLOSURE OF ALL FORWARD RCS TANK AND MANIFOLD
ISOLATION VALVES TO ISOLATE LEAK.
- (2) FAILURE OF SWITCH S1 OR S11 TO CONDUCT RESULTING IN LOSS OF ALL
FORWARD RCS FOR SAFE ET/ORB SEPARATION.

ALSO, FOR S1, S5, OR S11 FAILURE, POSSIBLE LOSS OF CREW/VEHICLE AFTER
SECOND FAILURE (LOSS OF REDUNDANT MOTOR OR POWER/CONTROL CIRCUIT) DUE
TO INABILITY TO OPEN VENT DOOR DURING DESCENT (RESULTS IN VEHICLE
STRUCTURAL DAMAGE DUE TO PRESSURE DIFFERENTIALS). LEFT AND RIGHT VENT
DOORS ARE NOT CONSIDERED TO BE REDUNDANT TO EACH OTHER. "B" SCREEN
PASSES SINCE THE FAILURE CAN BE DETECTED BY CREW MONITORING STAR
TRACKER DOOR OPERATION TIMES OR BY LOSS OF MCA OPERATIONAL STATUS
MEASUREMENTS AVAILABLE TO GROUND PERSONNEL.

DISPOSITION & RATIONALE:

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

A, B, C, D) DISPOSITION AND RATIONALE

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

B) GROUND TURNAROUND TEST

VERIFY MCA OPERATIONAL STATUS INDICATORS ARE "ON" (ALL MOTOR CONTROL
RELAYS RESET) DURING NO OPERATION OF THE AC MOTOR MECHANISMS. TEST IS
PERFORMED FOR ALL FLIGHTS.

E) OPERATIONAL USE

FOR LOSS OF REDUNDANT VENT DOOR OPEN CAPABILITY, OPEN VENT DOORS PRIOR
TO ENTRY.