

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2489 -2 REV:05/03/88

ASSEMBLY :FWD LCA-1,2 & 3 CRIT.FUNC: 1R  
 P/N RI :MC477-0261-0002 CRIT. HDW: 3  
 P/N VENDOR: VEHICLE 102 103 104  
 QUANTITY :3 EFFECTIVITY: X X X  
 :THREE, ONE PER INVERTER PHASE(S): FL X LO X OO X DO X LS X  
 :ARRAY

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

PREPARED BY: DES R PHILLIPS APPROVED BY: APPROVED BY (NASA):  
 REL M HOVE REL M. J. G. [Signature] SSM [Signature] 5/16/88  
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ITEM:

HYBRID DRIVER, TYPE I - GROUND CONTROL, INVERTER ARRAY "OFF"

FUNCTION:

UPON GROUND COMMAND "OFF" FROM MULTIPLEXER/DEMUTIPLEXER (MDM LF1), THE HYBRID DRIVER CONDUCTS PRE-FLIGHT TEST BUS POWER TO AN INVERTER ARRAY "OFF" CONTROL CIRCUIT. THE RELATED ARRAY IS DE-ENERGIZED AND POWER IS CUT-OFF TO THE ASSOCIATED THREE-PHASE AC BUS. 81V76A16AR(I) J1-2, 82V76A17AR(I) J1-2, 83V76A18AR(I) J1-2

FAILURE MODE:

FAILS "ON", INADVERTENT OUTPUT, FAILS TO TURN "OFF"

CAUSE(S):

PIECE PART FAILURE, MECHANICAL SHOCK, THERMAL STRESS, VIBRATION, CONTAMINATION, PROCESSING ANOMALY

EFFECT(S) ON:

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

(A,B,C,D) FIRST FAILURE - NO EFFECT. PRE-FLIGHT TEST BUSES ARE NORMALLY NOT POWERED DURING FLIGHT.

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF AC ELECTRICAL POWER NECESSARY FOR CRITICAL LOADS (LOSS OF TWO OF THREE AC BUSES) IF PRE-FLIGHT TEST BUS IS INADVERTENTLY POWERED DURING FLIGHT. REQUIRES THE FOLLOWING SCENARIO:

- (1) FAILED "ON" TYPE I HYBRID DRIVER.
- (2, 3) INADVERTENTLY POWERED PRE-FLIGHT TEST BUS (REQUIRES TWO FAILURES) WHICH RESULTS IN REMOVAL OF MAIN DC BUS POWER TO THE ASSOCIATED ARRAY AND SUBSEQUENT LOSS OF ONE THREE-PHASE AC BUS.
- (4) LOSS OF ANOTHER AC BUS.

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EFFECT(S) ON (CONTINUED):

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

FAILS "B" SCREEN SINCE THERE IS NO INDICATION THAT THIS FAILURE HAS  
OCCURRED UNTIL THE PRE-FLIGHT TEST BUS IS POWERED AND THE DC INPUT  
POWER IS SUBSEQUENTLY DISCONNECTED.

DISPOSITION & RATIONALE:

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

(B,C,D) DISPOSITION AND RATIONALE

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER

(B) GROUND TURNAROUND TEST

VERIFY MANUAL AC BUS ACTIVATION. CYCLE AC BUS AND INVERTER ARRAY MAIN  
DC BUS POWER "ON" AND VERIFY TALKBACKS INDICATE "ON". TEST IS  
PERFORMED FOR ALL VEHICLE FLOWS.

(E) OPERATIONAL USE

(NONE)