

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2486 -2 REV:05/03/88

ASSEMBLY :FWD LCA-1,2&3	CRIT.FUNC: 1R
P/N RI :MC477-0263-0002	CRIT. HDW: 3
P/N VENDOR:	VEHICLE 102 103 104
QUANTITY :9	EFFECTIVITY: X X X
:NINE, ONE PER	PHASE(S): PL X LO X OC X DO X LS X
:INVERTER	

PREPARED BY:	REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS	APPROVED BY:	APPROVED BY (NASA):
DES R PHILLIPS	DES <i>R. Busina</i>	SSM <i>W.C. Starn 5/16/88</i>	
REL M HOVE	REL <i>William Chater 5/16/88</i>	REL <i>W.C. Starn 5/16/88</i>	
QE J COURSEN	QE <i>D.J. Courser 5/16/88</i>	QE <i>W.C. Starn 5/16/88</i>	

ITEM:  
HYBRID DRIVER, TYPE III - INVERTER POWER "ON" CONTROL

FUNCTION:  
UPON "ON" SIGNAL FROM THE SERIES TYPE II HYBRID DRIVER, ESSENTIAL BUS POWER IS APPLIED TO THE INVERTER INPUT LATCHING RELAY, SUBSEQUENTLY PROVIDING DC INPUT POWER TO THE INVERTER. 81V76A16AR-J4(1, 2, 3), 82V76A17AR-J4(1, 2, 3), 83V76A18AR-J4(1, 2, 3)

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) LOSS OF CAPABILITY TO REMOVE DC POWER INPUT TO ONE SINGLE-PHASE INVERTER.

(B) LOSS OF REDUNDANCY FOR PROVIDING OVERVOLTAGE PROTECTION FOR CONNECTED LOADS.

(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 DUE TO LOSS OF CRITICAL LOADS (LOSS  
OF TWO OF THREE AC BUSES) VIA THE FOLLOWING SCENARIO:

- (1) FAILED "ON" TYPE III HYBRID DRIVER.
- (2) ASSOCIATED INVERTER OUTPUT RELAY TO AC BUS FAILED CLOSED.
- (3) ASSOCIATED SINGLE-PHASE INVERTER OVERVOLTAGE FAILURE RESULTING  
IN DAMAGE TO CRITICAL LOAD EQUIPMENT DUE TO INABILITY TO ISOLATE  
THE AC BUS FROM THE OVERVOLTAGE CONDITION (SAME EFFECT AS LOSS OF  
BUS).
- (4) LOSS OF ANOTHER THREE-PHASE AC BUS.

ILS "B" SCREEN SINCE EFFECT OF FAILURE IS NORMAL OPERATING CONDITION.

DISPOSITION & RATIONALE:

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

(A,B,C,D) DISPOSITION AND RATIONALE

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

(E) GROUND TURNAROUND TEST

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

(E) OPERATIONAL USE

NONE