

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2485 -2 REV:05/03/88

ASSEMBLY :FWD LCA-1,2&3 CRIT.FUNC: 1R
 P/N RI :MC477-0262-0002 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY :9 EFFECTIVITY: X X X
 :NINE, ONE PER EACH PHASE(S): PL X LO X DO X LS X
 :INVERTER

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES R PHILLIPS	DES <u>Sp. R. Brown</u>	SSM <u>A.C. Steg</u>
REL M HOVE	REL <u>Richard Chilton 5-6-88</u>	REL <u>Richard Chilton 5/11/88</u>
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ITEM:

HYBRID DRIVER, TYPE II - INVERTER POWER "ON", 1 SECOND DELAY

FUNCTION:

UPON COMMANDS FROM EITHER VEHICLE OR GROUND, THE HYBRID DRIVER'S ONE SECOND TIME DELAY CIRCUIT ALLOWS CONNECTION OF ESSENTIAL BUS POWER THROUGH TO CONTROL OF TYPE III HYBRID DRIVER FOR INVERTER POWER INPUT RELAY CIRCUIT. 81V76A16AR-J2(1, 2, 3), 82V76A17AR-J2(1, 2, 3), 83V76A18AR-J2(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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SYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2485 -2 REV:05/03/88

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 II 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.

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

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

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.

OPERATIONAL USE

ONE