

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2016 -2 REV:05/03/88

ASSEMBLY :INV DIST & CNTL ASSY CRIT.FUNC: 1R
 P/N RI :MC455-0128-0001 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY :9 EFFECTIVITY: X X X
 :NINE PHASE(S): PL X LG X CO X DO X LS X
 :

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES R PHILLIPS DES *R. Bassett* SSM *W. C. Stapp 5/12/88*
 REL M HOVE REL *Robert C. Hoag 5-6-88* REL *D. ... 5/2/88*
 QE J COURSEN QE *J. J. Courson 5/6/88* QE *J. J. Courson*

ITEM:
 RELAY, LATCHING - INVERTER TO AC BUS

FUNCTION:
 CONNECTS OR DISCONNECTS THE OUTPUT OF EACH SINGLE PHASE INVERTER TO A SINGLE PHASE OF A THREE-PHASE AC BUS. 81V76A35K1, K2, K3; 82V76A36K1, K2, K3; 83V76A37K1, K2, K3

FAILURE MODE:
 FAILS CLOSED, FAILS TO OPEN

CAUSE(S):
 CONTAMINATION, PIECE PART FAILURE, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS, PROCESSING ANOMALY

EFFECT(S) ON:
 (A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE (E)FUNCTIONAL CRITICALITY EFFECT:
 (A) LOSS OF CAPABILITY TO DISCONNECT ONE INVERTER PHASE FROM A SINGLE PHASE OF A THREE-PHASE AC BUS.
 (B) FIRST FAILURE - NO EFFECT. RELAY CLOSED IS NORMAL OPERATING MODE.
 (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 AC LOADS VIA
THE FOLLOWING SCENARIO:

- (1) RELAY FAILED CLOSED.
- (2) DC INPUT CONTACTOR FAILED CLOSED.
- (3) OVERVOLTAGE CONDITION ON ASSOCIATED PHASE OF A THREE-PHASE AC BUS
WHICH REQUIRES REMOVAL OF AC POWER FROM THAT PHASE IN ORDER TO AVOID
LOAD EQUIPMENT DAMAGE/LOSS. IF AC POWER IS NOT REMOVED THE DAMAGE TO
LOAD EQUIPMENT MAY PROPAGATE TO THE REMAINING TWO PHASES. (4) LOSS OF
ANOTHER AC THREE-PHASE BUS.

FAILS "B" SCREEN SINCE RELAY CLOSED IS NORMAL OPERATING MODE.

DISPOSITION & RATIONALE:

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

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

REFER TO APPENDIX C, ITEM NO. 3 - RELAY, LATCHING

(B) GROUND TURNAROUND TEST

PERFORM MANUAL AC BUS 1 (2, 3) ACTIVATION/DEACTIVATION WITH FREQUENCY AND
PHASE ANGLE VERIFICATION. MONITOR THE POWER "ON/OFF" SWITCH STIMULI
COMMANDS, "ON/OFF" EVENT DISCRETE INDICATORS, SWITCH SCAN DISCRETE, AND
PHASE A, B AND C VOLTAGES. TEST IS PERFORMED FOR ALL FLIGHTS.

(E) OPERATIONAL USE

NONE