

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2139 -2 REV:05/03/88

ASSEMBLY :FWD PCA 1,2 & 3	CRIT.FUNC: 1R
P/N RI :MC455-0134-0003	CRIT. HDW: 3
P/N VENDOR:	VEHICLE 102 103 104
QUANTITY :9	EFFECTIVITY: X X X
:NINE	PHASE(S): PL X LO X OO X DO X LS X
:	

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES R PHILLIPS	DES <i>R. Brunes</i>	SSM <i>R.C. Star 5/12/88</i>
REL M HOVE	REL <i>M. Chilton 5-6-88</i>	REL <i>W. H. ... 5/11/88</i>
QE J COURSEN	QE <i>P. Lawson 5/6/88</i>	QE <i>...</i>

ITEM:

CONTACTOR, GENERAL PURPOSE - INVERTER INPUT POWER

FUNCTION:

CONNECTS OR DISCONNECTS MAIN DC BUS POWER TO THE INPUT OF EACH SINGLE PHASE INVERTER. 81V76A22K1, K2, K3: 82V76A23K1, K2, K3: 83V76A24K1, K2, K3

FAILURE MODE:

FAILS CLOSED, FAILS TO OPEN

CAUSE(S):

PIECE PART FAILURE, MECHANICAL SHOCK, VIBRATION, PROCESSING ANOMALY

EFFECT(S) ON:

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

(A) LOSS OF CAPABILITY TO DISCONNECT 28 VOLT DC POWER FROM ONE INVERTER IN A THREE-PHASE ARRAY.

(B) FIRST FAILURE - NO EFFECT. CONTACTOR CLOSED IS NORMAL OPERATING MODE.

(C,D) FIRST FAILURE - NO EFFECT.

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SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2139 -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 AC LOADS VIA  
THE FOLLOWING SCENARIO:

- (1) CONTACTOR FAILED CLOSED.
- (2) OUTPUT RELAY 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 CONTACTOR 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. 5 - CONTACTOR, GENERAL PURPOSE

(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