

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2197 -2 REV:05/03/88

ASSEMBLY :FWD PCA-1, 2, 3 CRIT.FUNC: 1R
P/N RI :JANTX1N1204RA CRIT. HDW: 2
P/N VENDOR: VEHICLE 102 103 104
QUANTITY :18 EFFECTIVITY: X X X
:EIGHTEEN, TWO PER EACH PHASE(S): PL LO X OO X DO X LS
:RPC OUTPUT

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
PREPARED BY: APPROVED BY: APPROVED BY (NASA):
DES R PHILLIPS DES *9/1* *R. Beames* SSM *A. C. Stang 5/12/88*
REL M HOVE REL *David Clavin 5/6/88* REL *David Clavin 5/6/88*
QE J COURSEN QE *J. Courson 5/6/88* QE *PC*

ITEM:

DIODE, BLOCKING, 12 AMP - RPC TO CONTROL BUS

FUNCTION:

BLOCKS CURRENT FLOW BETWEEN TWO CONTROL BUSES POWERED FROM THE SAME REMOTE POWER CONTROLLER. PREVENTS REVERSE CURRENT THRU RPC FROM THE CONTROL BUSES TO THE MAIN DC BUS. 81V76A22CR1-6; 82V76A23CR1-6; 83V76A24CR1-6

FAILURE MODE:

SHORTS (CONDUCTS IN EITHER DIRECTION)

CAUSE(S):

THERMAL STRESS, STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, PROCESSING ANOMALY

EFFECT(S) ON:

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

(A) LOSS OF ISOLATION BETWEEN ASSOCIATED MAIN DC BUSES AND/OR THE CONTROL BUSES. AN OVERLOAD OF THE OTHER CONTROL BUS FED BY THE ASSOCIATED RPC MAY RESULT IN LOSS OF THE CONTROL BUS NORMALLY ISOLATED BY THE FAILED DIODE AND MAY CAUSE A LOSS OF REDUNDANT SOURCES FOR A THIRD CONTROL BUS.

(B,C,D) FIRST FAILURE - NO EFFECT.

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF TWO OR MORE CONTROL BUSES NECESSARY FOR THE OPERATION OF CRITICAL LOADS. THE SECOND FAILURE (SHORT TO GROUND ON ADJACENT CONTROL BUS) OPENS ASSOCIATED FUSES AND RPC'S TO BOTH CONTROL BUSES AS WELL AS TRIPPING BOTH RPC'S ON A THIRD CONTROL BUS. FAILS "B" SCREEN BECAUSE NO MEANS ARE PROVIDED TO DETECT A DIODE FAILED SHORTED IN FLIGHT.

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DISPOSITION & RATIONALE:

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

(B,C,D) DISPOSITION AND RATIONALE

REFER TO APPENDIX F, ITEM NO. 2 - POWER DIODE

) GROUND TURNAROUND TEST

VERIFY CONTROL BUS SOURCES BY MONITORING CIRCUIT BREAKER POSITIONS,
POWER STIMULI COMMANDS, DISCRETE EVENTS, AND BUS VOLTAGES. TEST IS
PERFORMED FOR ALL FLIGHTS.

) OPERATIONAL USE

NONE