

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - COMM. & TRACK. FMEA NO 05-6PG-21201 -2 REV:01/05/8

ASSEMBLY : PANEL A1A2 CRIT. FUNC: 1R
P/N RI : JANTXVIN4246 CRIT. HDW: 3
P/N VENDOR: VEHICLE 102 103 104
QUANTITY : 2 EFFECTIVITY: X X X
:TWO PHASE(S): PL LO X GO X DC X LS

PREPARED BY: *1-5-8* REDUNDANCY SCREEN: A-FAIL B-FAIL C-PAS
DES *M Zelon* M ZELON APPROVED BY: (NASA)
REL *M Alvarez* M ALVAREZ DES *[Signature]* 11/7/25 SSM *P.E. S...* 2/8/78
QE *Dun* COURSEN REL *[Signature]* 1-13-88 REL *[Signature]* 4/13/88
QE *[Signature]* QE *[Signature]* EPDC SSM *[Signature]*
EPDC REL *[Signature]*

ITEM:
DIODE, XPDR PWR CNTL CRT DIODE, S-BAND TRANSPONDER POWER CONTROL CIRCUIT.

FUNCTION:
IN CASE OF SWITCH (S16) FAILURE, PREVENTS UNWANTED INPUTS TO THE GCIL COMMAND MODE DRIVERS DUE TO REVERSE LEAKAGE CURRENT FLOW THROUGH THE CONTROL BUS & INTO THE COMMAND MODE DRIVERS. TWO DIODES, 36V73A1A2A16CR. CR2.

FAILURE MODE:
FAILS SHORT CIRCUIT (END TO END).

CAUSE(S):
STRUCTURAL FAILURE, MECHANICAL STRESS, VIBRATION, CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

EFFECT(S) ON:
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) NO EFFECT ON EPDC. LOSS OF PROTECTION FOR GCIL DRIVERS IN CASE OF SWITCH FAILURE. AFTER A SECOND DIODE FAILURE LOSS OF PROTECTION FOR BOTH TRANSPONDER GCIL POWER DRIVERS.

(B) AFTER THREE FAILURES (TWO DIODES AND ONE SWITCH SHORT TO GROUND), LOSS OF USE OF BOTH TRANSPONDERS.

(C,D) AFTER FOUR FAILURES (2 DIODE, 1 SWITCH, & UHF) POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF STATE VECTOR UPDATE CAPABILITY.

CRITICALITY 1R BECAUSE LOSS OF TRANSPONDERS MAY PREVENT STATE VECTOR UPDATE.

FAILS SCREEN "A" BECAUSE SHORTED DIODES CANNOT BE DETECTED DURING GROUND TURNAROUND TESTING.

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FAILS SCREEN "B" BECAUSE SHORTED DIODES CANNOT BE DETECTED DURING FLIGHT

DISPOSITION & RATIONALE:

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

(A,B,C,D) REFER TO APPENDIX F, ITEM #3, DIODE.

(B) TEST

GROUND TURNAROUND TEST - NO TESTS ARE AVAILABLE TO DETECT SHORTED DIODES DURING GROUND TURNAROUND.

(E) OPERATIONAL USE

CREW CAN USE THE REMAINING TRANSPONDER TO MAINTAIN S-BAND COMMUNICATIONS.