

SHUTTLE CRITICAL ITEMS LIST - ORBITER .

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2376 -2 REV:11/19/87

ASSEMBLY : AFT PCA-5 CRIT. FUNC: 1R
 P/N RI : JANTX1N1204RA CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 2 EFFECTIVITY: X X X
 : TWO PHASE(S): PL X LO X OO DO LS
 : 1 PER LH2/LO2 17" DISCONNECT LATCH

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES *JWB* J BROWN DES *RVB* EPDC SSM *Malcolm Brown C. S. King*
 REL *JF* F DEFENSOR REL *M. Chilton 12-5-87* MPS SSM
 QE DM D MASAI QE *D. D. [Signature]* EPDC REL *[Signature] for Mr. Peterson*
 MPS REL *[Signature]* QE *[Signature]*
 1/10/88

ITEM:
 DIODE, BLOCKING (12 AMP), LH2/LO2 17-INCH FEEDLINE DISCONNECT VALVE LATCH
 LOCK SOLENOID, RPC B OUTPUT DIODE.

FUNCTION:
 DIODE USED TO ISOLATE REDUNDANT MAIN BUS POWER TO A LOCK SOLENOID.
 LOCATED AT RPC B OUTPUT AHEAD OF LOCK COMMAND B HDC III.
 55V76A135A2CR39, CR42.

FAILURE MODE:
 SHORT, INTERNAL SHORT, CURRENT LEAKAGE

CAUSE(S):
 PIECE PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK,
 VIBRATION, THERMAL SHOCK

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

- (A) LOSS OF BUS ISOLATION.
- (B,C,D) NO EFFECT - FIRST FAILURE.

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(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER FOURTH FAILURE (SECOND FAILURE - LOSS OF MAIN BUS TO SERIES RPC CAUSING PARALLEL RPC TO TRIP WHICH RESULTS IN LOSS OF POWER TO LOCK SOLENOID, BISTABLE FEATURE MAINTAINS DISCONNECT LATCH IN LOCK POSITION. THIRD FAILURE - PREMATURE ACTUATION OF UNLOCK SOLENOID ROTATING LATCH TO UNLOCK POSITION. FOURTH FAILURE - FLAPPER FAILS TO THE CLOSED POSITION) RESULTING IN PREMATURE DISCONNECT VALVE CLOSURE WHILE ENGINES ARE RUNNING. SURGE PRESSURE FROM VALVE CLOSURE MAY CAUSE DAMAGE OR RUPTURE TO THE MPS AND/OR ET SYSTEM, DEPENDING ON THE RATE OF CLOSURE. SHUTDOWN OF ALL THREE SSMEs SIMULTANEOUSLY. UNCONTAINED ENGINE DAMAGE DUE TO STARVATION CUTOFF. FAILS B SCREEN BECAUSE RPC WILL NOT TRIP UNTIL SECOND FAILURE.

DISPOSITION & RATIONALE:

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

(A-D) DISPOSITION AND RATIONALE:

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

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION, V41ABO.155E, 165E EVERY FLIGHT

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.