

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2207 -2 REV: 11/04/87

ASSEMBLY : AFT PCA 4, 5, & 6 CRIT. FUNC: 1R
 P/N RI : JANTX1M1204RA CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 3 EFFECTIVITY: X X X
 : THREE PHASE(S): PL X LO X OO DO LS
 : 1 PER PREVALVE 1, 2, & 3

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 PREPARED BY: APPROVED BY APPROVED BY (NASA):
 DES J BROWN DES [Signature] EPDC SSM [Signature]
 REL F DEFENSOR REL [Signature] 12-5-87 MPS SSM [Signature]
 QE D MASAI QE [Signature] 11/17 EPDC REL [Signature]
 MPS REL [Signature]

ITEM:
 DIODE, BLOCKING (12 AMP), LH2 PREVALVE 1, 2, & 3, CLOSE COMMAND A RPC OUTPUT.

FUNCTION:
 USED TO ISOLATE REDUNDANT MAIN BUS POWER TO A COMMON CLOSE SOLENOID. LOCATED AT RPC OUTPUT AHEAD OF CLOSE COMMAND B HDC III. 54V76A134A4CR25, 55V76A135A4CR25, 56V76A136A4CR25.

FAILURE MODE:
 SHORT, INTERNAL SHORT, CURRENT LEAKAGE

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

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

(A) DEGRADATION OF MAIN BUS ISOLATION.

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - LOSS OF MAIN BUS TO COMMAND A RPC. COMMAND B RPC TRIPS BECAUSE IT FEEDS THE LOAD ON THE FAILED BUS BY WAY OF THE COMMAND B HDC III REVERSE BIAS DIODE. LOSS OF POWER TO CLOSE SOLENOID. THIRD FAILURE - SSME SHUTDOWN WITH UNCONTAINED DAMAGE REQUIRING LH2 PROPELLANT SUPPLY ISOLATION) DUE TO INABILITY TO CLOSE LH2 PREVALVE. FAILS SCREEN B NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE.

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DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE

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

(B) GROUND TURNAROUND TEST

MDM COMMAND REDUNDANCY, V41AEO.180J; 200J; 220J EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN

GROUND - IF A MAJOR LEAK IS DETECTED, CLOSE PREVALVES (PV4, 5, 6), LH2
17-INCH DISCONNECT (PD2), LH2 4-INCH RECIRC DISCONNECT (PD3), LH2
RECIRC VALVES (PV14-16); DRAIN MANIFOLD.

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