

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2208 -1 REV:11/04/87

ASSEMBLY : AFT PCA-4, 5, 6 CRIT. FUNC: 1R  
 P/N RI : JANTX1N1204RA 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]* MPS SSM *[Signature]*  
 QE D MASAI QE *[Signature]* EPDC REL *[Signature]*  
 MPS REL *[Signature]*

ITEM:

DIODE, CROSSOVER (12 AMP), LH2 PREVALVE 1, 2, & 3 CLOSE SOLENOID POWER.

FUNCTION:

PREVENTS INADVERTENT MDM COMMAND OR PREMATURE HDC I OUTPUT FROM ACTUATING CLOSE SOLENOID PREMATURELY. DIODE ISOLATES REDUNDANT POWER WHICH ENERGIZES THE CLOSE SOLENOID FOR THE LH2 PREVALVES. ISOLATES REDUNDANT POWER BETWEEN RPC OUTPUTS. 54V76A134A4CR27, 55V76A135A4CR27, 56V76A136A4CR27.

FAILURE MODE:

OPENS, FAILS OPEN, FAILS TO CONDUCT.

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) LOSS OF CLOSE COMMAND A POWER PATH TO CLOSE COMMAND C HDC III. DEGRADATION OF REDUNDANCY TO POWER CLOSE SOLENOID.

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - LOSS OF HDC I ON CLOSE COMMAND B INPUT STRING CAUSING LOSS OF BOTH POWER PATHS TO THE CLOSE SOLENOID. THIRD FAILURE - SSME SHUTDOWN WITH UNCONTAINED DAMAGE REQUIRING LH2 PROPELLANT SUPPLY ISOLATION) DUE TO INABILITY TO CLOSE LH2 PREVALVE. FAILS B SCREEN BECAUSE FAILURE IS MASKED BY REDUNDANT POWER PATH.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2208 -1 REV:11/04/87

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, V41AEC.180L, 200L, 220L 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.

05-6J-334