

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2208 -3 REV:11/04/87
 ASSEMBLY : AFT PCA-4, 5, 6 CRIT. FUNC: 1R
 P/N RI : JANTX1N1204RA CRIT. HDW: 2
 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-PASS 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] 1/5/87 MPS REL [Signature]
 QE [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:

SHORTS TO GROUND.

CAUSE(S):

PIECE PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) LOSS OF POWER TO CLOSE SOLENOID - BOTH RPCs WILL TRIP. SERIES RPC WILL TRIP DUE TO THE LOAD TERMINAL DIRECTLY CONNECTING TO GROUND; PARALLEL RPC WILL TRIP DUE TO THE LOAD TERMINAL CONNECTING TO GROUND THROUGH THE HDC III REVERSE BIAS DIODE.

(B,C,D) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (SSME SHUTDOWN WITH UNCONTAINED DAMAGE REQUIRING PROPELLANT SUPPLY ISOLATION) DUE TO INABILITY TO CLOSE LH2 PREVALVE. CRITICALITY 1/1 FOR ENGINE-OUT ABORTS - POSSIBLE LOSS OF CREW/VEHICLE DUE TO FAILURE TO ISOLATE PROPELLANT SUPPLY FROM FAILED SSME (INITIATING ABORT).

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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.180G, 200G, 220G 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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