

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2206 -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 CO 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 EPDC REL [Signature]  
 QE D MASAI QE [Signature] 11/5/87 MPS REL [Signature]

ITEM:

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

FUNCTION:

PREVENTS INADVERTENT MDM COMMAND OR PREMATURE HDC I OUTPUT FROM ACTUATING OPEN SOLENOID PREMATURELY. DIODE ISOLATES REDUNDANT POWER WHICH ENERGIZES THE OPEN SOLENOID FOR THE LH2 PREVALVES. ISOLATES REDUNDANT POWER BETWEEN RPC OUTPUTS. 54V76A134A4CR28, 55V76A135A4CR28, 56V76A136A4CR28.

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 OPEN 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. BISTABLE FEATURE MAINTAINS PREVALVE IN OPEN POSITION.

(B,C,D) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (PREMATURE ACTUATION OF CLOSE SOLENOID) RESULTING IN PREMATURE LH2 PREVALVE CLOSURE WHILE ENGINE IS RUNNING. UNCONTAINED ENGINE DAMAGE DUE TO ENGINE STARVATION CUTOFF. NOTE - BISTABLE FEATURE NOT DEMONSTRATED BY TEST (CERTIFIED BY ANALYSIS). A FULL FLOW DETENT VERIFICATION TEST IS SCHEDULED FOR GFY 1988.

05-6J-327.

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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.180A; 200A; 220A EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

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