

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2248 -2 REV: 11/19/87

ASSEMBLY : AFT PCA-2 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 FEED DISCONNECT VALVE

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <i>J/B</i> J BROWN	DES <i>J.V. Brown</i>	EPDC SSM <i>Orlando H. C. Stagg</i>
REL <i>J</i> F DEFENSOR	REL <i>Mohamed Ch. Hane 12/5/87</i>	MPS SSM <i>[Signature]</i>
QE <i>DM</i> D MASAI	QE <i>[Signature] 12/9/87</i>	EPDC REL <i>[Signature] for M/C Peterson</i>
		MPS REL <i>[Signature]</i>
		QE <i>[Signature]</i>

ITEM:

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

FUNCTION:

DIODE USED TO ISOLATE REDUNDANT MAIN BUS B POWER TO AN OPEN SOLENOID. LOCATED AT RPC B OUTPUT AHEAD OF OPEN COMMAND C HDC III. 55V76A132A2CR6, A3CR12.

FAILURE MODE:

SHORT, INTERNAL SHORT, CURRENT LEAKAGE

CAUSE(S):

PIECE PART MECHANICAL 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 BUS ISOLATION.

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

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(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - LOSS OF MAIN BUS TO SERIES RPC CAUSING PARALLEL RPC TO TRIP WHICH RESULTS IN LOSS OF OPEN SOLENOID POWER, BISTABLE FEATURE MAINTAINS DISCONNECT VALVE IN OPEN POSITION. THIRD FAILURE - PREMATURE ACTUATION OF CLOSE SOLENOID) 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 SINCE RPC WILL NOT TRIP UNTIL SECOND FAILURE. NOTE - LATCH IS NOT DESIGNED OR CERTIFIED TO HOLD PNEUMATICALLY-CLOSED FLAPPER UNDER FLOW CONDITIONS, THEREFORE, NOT CONSIDERED A VALID SUCCESS PATH FOR THIS SCENARIO.

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

COMPLETE ELECTRICAL VERIFICATION, V4LABO.150B, 160B EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

05-6J-402