

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2399 -2 REV:11/04/87

ASSEMBLY : AFT PCA-3 CRIT. FUNC: 1R
 P/N RI : JANTX1N1204RA CRIT. HDW: 3
 P/N VENDCR: 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 J BROWN	DES <i>[Signature]</i>	EPDC SSM <i>[Signature]</i>
REL F DEFENSOR	REL <i>[Signature]</i> 11/4/87	MPS SSM <i>[Signature]</i>
QE D MASAI	QE <i>[Signature]</i> 11/9/87	EPDC REL <i>[Signature]</i>
		MPS REL <i>[Signature]</i>
		QE <i>[Signature]</i> 11/11/88

ITEM:

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

FUNCTION:

DIODE USED TO ISOLATE REDUNDANT MAIN BUS POWER TO AN OPEN SOLENOID. LOCATED AT RPC C OUTPUT AHEAD OF OPEN COMMAND B HDC III. 56V76A133A2CR8, 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) DEGRADATION OF MAIN 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 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 OPEN SOLENOID. 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 BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT 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, V41AB0.150E, 160E EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.