

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2184 -2 REV: 11/04/8

ASSEMBLY : AFT LCA-1, 2, & 3, AV BAY-4, 5, & 6 DIODE BOX CRIT. FUNC: 1R
P/N RI : JANTXVIN5551 CRIT. HDW: 3
P/N VENDOR: VEHICLE 102 103 104
QUANTITY : 12 EFFECTIVITY: X X X
: TWELVE PHASE(S): PL X LO X OO DO LS
: 4 PER PREVALVE 1, 2, & 3

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

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> 12-5-87	MPS SSM <i>[Signature]</i>
QE D MASAI	QE ^{DM} <i>[Signature]</i> 1/8/7	EPDC REL <i>[Signature]</i>
		MPS REL <i>[Signature]</i>

ITEM:
DIODE, BLOCKING (3 AMP), MAINSTAGE MDM TO SWITCH COMMAND, LO2 PREVALVE 2, & 3.

FUNCTION:
DIODE ISOLATES MANUAL SWITCH COMMAND FROM MDM, CONDUCTS MDM COMMAND TO INHIBIT HYBRID DRIVER CONTROLLER FOR CONTROL OF REDUNDANT POWER TO CLOSE SOLENOIDS FOR LO2 PREVALVE OPERATION. ALSO ISOLATES LO2 MANUAL SWITCH COMMAND FROM LH2 CIRCUIT. ALCA1 - J1(27), J1(31). ALCA2 - J1(27), J1(31). ALCA3 - J1(27), J1(31). 54V76A207 - J1(83), J1(111). 55V76A208 - J1(83), J1(100). 56V76A209 - J1(87), J1(92).

FAILURE MODE:
SHORT, INTERNAL SHORTS, CURRENT LEAKAGE

CAUSE(S):
CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS.

EFFECT(S) ON:
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

(A) DEGRADATION OF REDUNDANCY AGAINST FAILURE TO CLOSE LH2 PREVALVE. LOSS OF LO2 MANUAL SWITCH COMMAND ISOLATION FROM LH2 CIRCUIT.

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

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(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER FIFTH FAILURE (SECOND FAILURE - SECOND LO2 MAINSTAGE DIODE SHORTS. THIRD FAILURE - SSME SHUTDOWN WITH UNCONTAINED DAMAGE REQUIRING PROPELLANT SUPPLY ISOLATION. FOURTH AND FIFTH FAILURES - TWO POLES OF MANUAL LO2 PREVALVE SWITCH CONTACT-TO-CONTACT SHORT DUE TO DUAL PIECE PART STRUCTURAL FAILURES. A, B, OR C ROLLERS MOVE FROM GPC TO OPEN. INHIBITS FROM LO2 SWITCH PROPAGATE INTO LH2 CIRCUIT) DUE TO FAILURE TO ISOLATE LH2 PROPELLANT SUPPLY. FAILS B SCREEN BECAUSE MAINSTAGE COMMANDS ARE NOT INSTRUMENTED.

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. 4 - DIODE.

(B) GROUND TURNAROUND TEST

PREVALVE CLOSE INHIBIT REDUNDANCY VERIFICATION AGO.070E, 80E, 90E 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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