

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2390 -2 REV:11/04/87

ASSEMBLY : AFT PCA-4, 5, & 6 CRIT. FUNC: LR  
 P/N RI : JANTXV1N4246 CRIT. HDW: 3  
 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-FAIL B-FAIL C-PASS

PREPARED BY:	DES	J BROWN	APPROVED BY:	DES	<i>[Signature]</i>	APPROVED BY (NASA):	EPDC SSM	<i>[Signature]</i>
REL	F DEFENSOR	REL	<i>[Signature]</i>	REL	<i>[Signature]</i>	EPDC REL	<i>[Signature]</i>	<i>[Signature]</i>
QE	D MASAI	QE	<i>[Signature]</i>	QE	<i>[Signature]</i>	MPS REL	<i>[Signature]</i>	<i>[Signature]</i>

ITEM:

DIODE, BLOCKING (1 AMP), SWITCH SCAN DIODE (OPEN POSITION), LO2 PREVALVES 1, 2, & 3.

FUNCTION:

DIODE ISOLATES OPEN SWITCH SCAN SIGNALS FROM OTHER MANUAL SWITCH OPEN COMMANDS. 54V76A134A3CR11, 55V76A135A3CR11, 56V76A136A3CR11.

FAILURE MODE:

SHORTS, 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) LOSS OF REDUNDANCY FOR MANUAL SWITCH OPEN COMMAND ISOLATION.

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER FIFTH FAILURE (SECOND FAILURE - SERIES SWITCH SCAN DIODE SHORTS. THIRD FAILURE - GROUNDING DIODE FAILS OPEN. FOURTH FAILURE - ROLLER/SPRING OF POLE ASSOCIATED WITH SHORTED SWITCH SCAN DIODE BREAKS AND LANDS ON POLE ASSOCIATED WITH FAILED GROUNDING DIODE PROVIDING TWO INADVERTENT OPEN COMMANDS WHICH ENERGIZE OPEN SOLENOID 1 AND A HDC III TO OPEN SOLENOID 2. FIFTH FAILURE - PREMATURE OUTPUT OF RPC DRIVING THE ENERGIZED HDC III TO OPEN SOLENOID 2; RESULTING IN UNCONTAINED ENGINE DAMAGE DUE TO FAILURE TO CLOSE LO2 PREVALVE AT MECO + 1.158 SECONDS. PREVALVE CLOSURE REQUIRED TO MAINTAIN NET POSITIVE SUCTION PRESSURE ON SSME HIGH PRESSURE OXIDIZER TURBOPUMP. FAILS A AND B SCREENS BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT THIS FAILURE - REQUIRES INVASIVE TESTING.

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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. 3 - DIODE.

(B) GROUND TURNAROUND TEST

UNDETECTABLE - REQUIRES INVASIVE TESTING.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

GROUND - IF A MAJOR LEAK IS DETECTED, CLOSE PREVALVES (PV1, 2, 3), LO  
17-INCH DISCONNECT (PD1); DRAIN MANIFOLD.

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