

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2196 -2 REV:11/04/87

ASSEMBLY :AFT PCA-4, 5, & 6, AV BAY 4, 5, & 6 DIODE BOX CRIT. FUNC: 1R
 P/N RI :JANTXVIN4246 (QTY 6) / 5551 (QTY 6) CRIT. HDW: 3
 F/N VENDOR: VEHICLE 102 103 104
 QUANTITY :12 EFFECTIVITY: X X X
 :TWELVE PHASE(S): PL X LO X CO DO LS
 :4 PER PREVALVE 1, 2, & 3

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

PREPARED BY:	J BROWN	APPROVED BY:	<i>[Signature]</i>	APPROVED BY (NASA):	
DES		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	<i>[Signature]</i>	EPDC REL	<i>[Signature]</i>
				MPS REL	<i>[Signature]</i>

ITEM:

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

FUNCTION:

DIODE ISOLATES OPEN SWITCH SCAN SIGNALS FROM OTHER MANUAL SWITCH OPEN COMMANDS. 54V76A134A3CR12, 15; 55V76A135A3CR12, 15; 56V76A136A3CR12, 15; AV BAY 4, P140(85), (71); AV BAY 5, P140(75), (89); AV BAY 6, P140(91), (101).

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 MANUAL SWITCH OPEN COMMAND ISOLATION.

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

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(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER FOURTH FAILURE (SECOND FAILURE - GROUNDING DIODE FAILS OPEN. THIRD 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. FOURTH 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 B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT THIS FAILURE.

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE

REFER TO APPENDIX F, ITEMS NO. 3 AND 4 - DIODE.

(B) GROUND TURNAROUND TEST

D & C CONTROL BUS REDUNDANCY, V41AFO.041E, G, J; 061E, G, J; 081E, H, G EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

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