

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2012A -2 REV:04/25/88

ASSEMBLY : MID PCA-1,3	CRIT. FUNC: 1R
P/N RI : JANTXVIN4246	CRIT. HDW: 2
P/N VENDOR:	VEHICLE 102 103 104
QUANTITY : 3	EFFECTIVITY: X X X
: THREE	PHASE(S): PL LO X OO DO LS
:	

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <i>J. Brown</i> J BROWN	DES <i>[Signature]</i>	EPDC SSM <i>[Signature]</i>
REL F DEFENSOR <i>[Signature]</i>	REL <i>[Signature]</i> 5-6-88	MPS SSM <i>[Signature]</i> 5-12-87
QE <i>[Signature]</i> D MASAI	QE <i>[Signature]</i> 5-6-88	EPDC REL <i>[Signature]</i> 5-11-88
		MPS REL <i>[Signature]</i> 5-13-88
		QE <i>[Signature]</i>

ITEM:
DIODE, BLOCKING (1 AMP), LO2 RELIEF SHUTOFF VALVE, CLOSE SWITCH SCAN.

FUNCTION:
ISOLATES CONTROL BUSES AND CLOSE COMMANDS IN THE SWITCH SCAN CIRCUIT.
40V76A27A1CR35, 40V76A25A5CR3, 5.

FAILURE MODE:
SHORT (END TO END).

CAUSE(S):
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION,
ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

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

(A) LOSS OF MANUAL SWITCH CLOSE COMMAND AND CONTROL BUS ISOLATION.
DEGRADATION OF REDUNDANCY AGAINST INADVERTENT POWER TO CLOSE SOLENOID OF
LO2 RELIEF SHUTOFF VALVE.

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

(E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE. TIME FRAME - ASCENT.
1) DIODE SHORTS.
2) SWITCH CONTACT-TO-CONTACT SHORT OF EITHER CLOSE COMMAND, RESULTING
IN LOSS OF CAPABILITY TO OPEN LO2 RELIEF SHUTOFF VALVE (PV7).

RESULTS IN LACK OF RELIEF CAPABILITY PRIOR TO DUMP. POSSIBLE RUPTURE OF
THE LO2 MANIFOLD CAUSING LO2 LEAKAGE INTO AFT COMPARTMENT,
OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF ADJACENT
CRITICAL COMPONENTS DUE TO CRYOGENIC EXPOSURE.

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A VENT PATH EXISTS (APPROXIMATELY 4 SCFM PER BLEED CHECK VALVE) THROUGH THE POGO SYSTEM TO THE SSME HPOT SEAL AND RELEASED OVERBOARD. THIS VENT PATH IS NOT CONSIDERED SUFFICIENT TO RELIEVE THE LO2 MANIFOLD IF THE MANIFOLD RELIEF SYSTEM FAILS.

FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE.

DISPOSITION & RATIONALE:

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

(A-D) DISPOSITION AND RATIONALE:

REFER TO APPENDIX F, ITEM NO. 3 - DIODE, AXIAL LEAD.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION V41ABO.070 A,E EVERY FLIGHT.

(E) OPERATIONAL USE

LO2 MANIFOLD PRESSURE IS ON CAUTION AND WARNING.

POST MECO/PRE DUMP: START MPS PROPELLANT DUMP AS SOON AS POSSIBLE.

POST DUMP: OPEN THE LO2 FILL/DRAIN VALVES.