

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2238A -2 REV: 09/02/88

ASSEMBLY : MID PCA-1, 3
 P/N RI : JANTXV1N4246
 P/N VENDOR:
 QUANTITY : 3
 : THREE
 :

	VEHICLE	102	103	104
EFFECTIVITY:		X	X	X
PHASE(S):	PL	LO X	OO	DO LS

CRIT. FUNC: 1R
 CRIT. HDW: 3

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

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

ITEM:

CIODE, BLOCKING (1 AMP), LO2 RELIEF SHUTOFF VALVE (PV7), SWITCH CLOSE COMMAND.

FUNCTION:

ISOLATES MDM CLOSE COMMAND FROM MANUAL SWITCH CLOSE COMMAND. CONDUCTS MANUAL SWITCH CLOSE COMMAND TO CLOSE SOLENOID FOR LO2 RELIEF SHUTOFF VALVE. 40V76A25A5CR4, 40V76A27A1CR32, CR36.

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) DEGRADATION OF REDUNDANCY AGAINST INADVERTENT ACTUATION OF CLOSE SOLENOID.

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

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SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2238A -2 REV:09/03/88

- (E) 1R/3, 2 SUCCESS PATHS AFTER FIRST FAILURE. TIME FRAME - ASCENT.
1) DIODE SHORTS.
2) CLOSE SWITCH SCAN DIODE SHORTS.
3) INADVERTENT CLOSE MDM 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, OVERPRESSURISATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF ADJACENT CRITICAL COMPONENTS DUE TO CRYOGENIC EXPOSURE. POSSIBLE LOSS OF CREW/VEHICLE.

A VENT PATH EXISTS (APPROXIMATELY 4 SCFM PER BLEED CHECK VALVE) THROUGH THE POGO SYSTEM TO THE SEME 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 V4LAB0.070P EVERY FLIGHT.

(E) OPERATIONAL USE

LO2 MANIFOLD PRESSURE IS ON CAUTION AND WARNING.

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

POST DUMP: OPEN THE LO2 FILL/DRAIN VALVES.

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