

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2240A -2 REV: 09/02/88

ASSEMBLY : MID PCA-3 CRIT. FUNC: 1R
 P/N RE : JANIX1N1204RA CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 1 EFFECTIVITY: X X X
 : ONE PHASE(S): PL LO X OO DO LS

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA)
 DES J B J BROWN DES [Signature] EPDC SSM [Signature]
 REL g P DEFENSOR REL [Signature] MPS SSM [Signature]
 QE DAVID MASAI QE [Signature] EPDC REL [Signature]
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ITEM:

DIODE, CROSSOVER (12 AMP), LO2 RELIEF SHUTOFF VALVE CLOSE SOLENOID (LV24).

FUNCTION:

PREVENTS SINGLE MDM COMMAND FROM ACTUATING CLOSE SOLENOID INADVERTENTLY. 40VT6A27A4CR4.

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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- (E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE. TIME FRAME - ASCENT.
1) DIODE SHORTS.
2) INADVERTENT CLOSE COMMAND B, 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. POSSIBLE LOSS OF CREW/VEHICLE.

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. 2 - DIODE, STUD-MOUNT.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION V41AB0.070M EVERY FLIGHT.

(E) OPERATIONAL USE

LO2 MANIFOLD PRESSURE IS ON CAUTION AND WARNING:

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

POST DUMP: OPEN THE LO2 FILL/DRAIN VALVES.

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