

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP.

FMEA NO 05-6J -2397 -1

REV: 04/25/88

ASSEMBLY : MID PCA-1
 P/N RI : JANTX1N1204RA
 P/N VENDOR:
 QUANTITY : 2
 : TWO
 :

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

CRIT. FUNC: 1R
 CRIT. HDW: 3

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

PREPARED BY: APPROVED BY:
 DES *J B* J BROWN DES *R. Brown*
 REL F DEFENSOR *REL Michael Pl. Hon. 5-6-88*
 QE *g.f. for* D MASAI QE *J. J. Lansen 5-6-88*

APPROVED BY (NASA):
 EPDC SSM *Lowell D. ... 5/13/88*
 MPS SSM *...*
 EPDC REL *...*
 MPS REL *...*
 QE *...*

ITEM:

DIODE, BLOCKING (12 AMP), LO2/LH2 RELIEF SHUTOFF VALVE (PV7/3), RPC A OUTPUT.

FUNCTION:

ISOLATES REDUNDANT MAIN BUS POWER TO CLOSE SOLENOID. LOCATED AT RPC A OUTPUT AHEAD OF CLOSE COMMAND B HDC. 40V76A25A2CR8, A2CR11.

FAILURE MODE:

OPEN, FAILS TO CONDUCT.

MODE(S):

STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

(A) LOSS OF CLOSE COMMAND A POWER PATH TO HDCs. DEGRADATION OF REDUNDANCY AGAINST INADVERTENT DEACTUATION OF CLOSE SOLENOID.

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

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- (E) 1R/3, 2 SUCCESS PATHS AFTER FIRST FAILURE.
TIME FRAME - PRELAUNCH AND ASCENT.
- 1) DIODE OPENS.
 - 2) PARALLEL POWER PATH FAILS (HDC, RPC, OR DIODE) CAUSING LO2/LH2 RELIEF SHUTOFF VALVE (PV7/8) TO OPEN. FEEDLINE RELIEF VALVE (RV5/6) WILL PREVENT OVERBOARD LEAKAGE OF LO2/LH2 (RELIEF VALVE CRACK PRESSURE IS ABOVE NOMINAL SYSTEM OPERATING PRESSURE).
 - 3) RELIEF VALVE (RV5/6) FAILS TO REMAIN CLOSED.

LO2/LH2 WILL DUMP OVERBOARD RESULTING IN LOSS OF PROPELLANT AND POSSIBLE PREMATURE ENGINE SHUTDOWN. FIRE/EXPLOSION HAZARD EXTERIOR TO THE VEHICLE. POSSIBLE VIOLATION OF ET MINIMUM STRUCTURAL REQUIREMENTS DUE TO REDUCED ULLAGE PRESSURE. POSSIBLE LOSS OF CREW/VEHICLE.

FAILS B SCREEN BECAUSE PARALLEL POWER PATH MASKS 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 V41ABO.070N, V41ABO.080N EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT: NO CREW ACTION CAN BE TAKEN.

GROUND: OMI S1003/S1004 (LO2/LH2 SYSTEM) SEQUENCE TITLED "EMERGENCY PROCEDURE FOR MAJOR LEAK OR FIRE . . ." CONTAINS SAFING SEQUENCE OF EVENTS FOR MAJOR LEAKS IN THE PROPELLANT SYSTEMS.