

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2144 -2 REV: 06/16/88

ASSEMBLY : MID PCA-1, 2, 3	CRIT. FUNC: 1R
P/N RI : JANTX1N1204RA	CRIT. HDW: 3
P/N VENDOR:	VEHICLE 102 103 104
QUANTITY : 6	EFFECTIVITY: X X X
: SIX	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>JMB</i> J BROWN	DES <i>J. Brown</i>	EPDC SSM <i>[Signature]</i>
REL <i>JF</i> DEFENSOR	REL <i>J Kamura 6/27/88</i>	MPS SSM <i>[Signature]</i>
QE <i>D.M. Masai</i> D MASAI	QE <i>J. Conner 6/27/88</i>	EPDC REL <i>[Signature]</i>
		MPS REL <i>[Signature]</i>

ITEM:  
DIODE, BLOCKING (12 AMP), HELIUM INTERCONNECT "IN" VALVE (LV59, 61, 63)  
OPEN SOLENOID.

FUNCTION:  
ISOLATES REDUNDANT MAIN BUS POWER TO HELIUM INTERCONNECT "IN" VALVE OPEN  
SOLENOID, LOCATED AT RPC OUTPUT.  
40V76A25A2CR12, A4CR5. 40V76A26A2CR14, CR15. 40V76A27A4CR9, CR10.

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 BUS ISOLATION. DEGRADATION OF REDUNDANCY AGAINST  
INADVERTENT DEACTUATION OF OPEN SOLENOID.  
  
(B,C,D) NO EFFECT - FIRST FAILURE.

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- (E) 1R/3, 2 SUCCESS PATHS AFTER FIRST FAILURE.  
TIME FRAME - ASCENT.
- 1) DIODE SHORTS.
  - 2) FAILURE OF MAIN BUS TO SERIES RPC CAUSING PARALLEL RPC TO TRIP. LOSS OF POWER PATH TO HELIUM INTERCONNECT "IN" VALVE OPEN SOLENOID CAUSING IN VALVE TO CLOSE.
  - 3) ENGINE HELIUM SYSTEM LEAK (ASSUMES RATE SUCH THAT DEPLETION OCCURS SIMULTANEOUS WITH MECO).

RESULTS IN INTERRUPTION OF ENGINE HELIUM PURGE AND FAILURE TO MAINTAIN INJECTED HELIUM AND LO2 PRESSURE TO THE HIGH PRESSURE OXYGEN TURBOPUMP TO PREVENT PUMP OVERSPEED AND CAVITATION AT MECO. RESULTS IN UNCONTAINED ENGINE DAMAGE, AFT COMPARTMENT OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF CREW/VEHICLE.

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) FOR DISPOSITION AND RATIONALE:

REFER TO APPENDIX F, ITEM NO. 2 - DIODE, POWER - STUD MOUNTED.

(B) GROUND TURNAROUND TEST

HE INTCN VLVS COMPLETE CMD VERIF, V41AAO.020B,C V41AAO.040B,C  
V41AAO.060B,C EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.