

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2144 -1 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>JWB</i> J BROWN	DES <i>A. Brown</i>	EPDC SSM <i>Michael J. ...</i>
REL <i>JF</i> DEFENSOR	REL <i>J. Kamura 6/27/88</i>	MPS SSM <i>...</i>
QE <i>D. Masai</i> D MASAI	QE <i>S. G. ... 6/27/88</i>	EPDC REL <i>...</i>
		MPS REL <i>...</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:

OPENS, FAILS TO CONDUCT.

CAUSE(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 ONE OR TWO POWER PATHS TO HELIUM INTERCONNECT "IN" VALVE OPEN SOLENOID. 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.
- 1) DIODE FAILS OPEN.
 - 2) PARALLEL POWER PATH FAILS "OFF" (HDC, RPC, OR DIODE) CAUSING HELIUM INTERCONNECT "IN" VALVE (LV59, 621, 63) 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 PARALLEL POWER PATH MASKS 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.