

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2147 -2 REV:06/16/88

ASSEMBLY : MID PCA-1, 2, 3 CRIT. FUNC: 1R
 P/N RI : JANTXVIN4246 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 J BROWN DES [Signature] EPDC SSM [Signature]
 REL F DEFENSOR REL [Signature] 6/27/88 MPS SSM [Signature]
 QE D MASAI QE [Signature] 6/27/88 EPDC REE [Signature]
 MPS RET [Signature] QE [Signature]

ITEM:

DIODE, BLOCKING (1 AMP), HELIUM INTERCONNECT "OUT OPEN" SWITCH SCAN.

FUNCTION:

ISOLATES CONTROL BUSES IN THE "OUT OPEN" SWITCH SCAN CIRCUIT.
 40V76A25A6CR1, CR8. 40V76A26A5CR1, A5CR8. 40V76A27A5CR1, A5CR8.

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 CONTROL BUS ISOLATION. DEGRADATION OF REDUNDANCY AGAINST
 INADVERTENT DEACTUATION OF HELIUM INTERCONNECT IN VALVE 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 (END TO END).
 - 2) SWITCH CONTACT TO CONTACT SHORT OF PARALLEL SET OF "OUT OPEN" CONTACTS, RESULTING IN INHIBIT COMMANDS TO HELIUM INTERCONNECT IN VALVE OPEN SOLENOID AND OPEN COMMAND TO HELIUM INTERCONNECT OUT VALVE OPEN SOLENOID.
 - 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. 3 - DIODE, AXIAL LEAD.

(B) GROUND TURNAROUND TEST

HE INTCH VLVS COMPLETE CMD VERIF, V41AAO.020L,M; V41AAO.040L,M;
V41AAO.060L,M EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

05-6J-257