

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2148 -2 REV:06/16/88

ASSEMBLY : MID PCA-1, 2, 3 CRIT. FUNC: 1R
 P/N RI : JANTXV1N4246 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 3 EFFECTIVITY: X X X
 : THREE PHASE(S): PL LO X OO DO LS
 :

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES AMB J BROWN DES [Signature] EPDC SSM [Signature]
 REL [Signature] DEFENSOR REL J. Kamusa 6/27/88 EPDC REL [Signature]
 QE [Signature] D MASAI QE [Signature] MPS REL [Signature]
 QE [Signature]

ITEM:
 DIODE, BLOCKING (1 AMP), HELIUM INTERCONNECT "IN OPEN" SWITCH SCAN.

FUNCTION:
 ISOLATES CONTROL BUSES IN THE "IN OPEN" SWITCH SCAN CIRCUIT.
 40V76A25A6CR7, A26A5CR7, A27A5CR7.

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

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- (E) 1R/3, 4 SUCCESS PATHS AFTER FIRST FAILURE.
TIME FRAME - POST MECO.
- 1) DIODE SHORTS (END TO END).
 - 2) SWITCH CONTACT-TO-CONTACT SHORT OF PARALLEL SET OF "IN OPEN" CONTACTS RESULTING IN INHIBIT COMMAND TO ENGINE 1 OR 3 HELIUM INTERCONNECT OUT VALVE OPEN SOLENOID.
 - 3) ENGINE 2 HELIUM SYSTEM LEAK. CREW INTERCONNECTS PNEUMATIC HELIUM SUPPLY WHICH EXTENDS ENGINE OPERATION LONG ENOUGH TO AVOID AN ABORT. PNEUMATIC AND ENGINE 2 HELIUM SUPPLIES ARE EXHAUSTED AND ENGINE SHUTS DOWN SAFELY.
 - 4) ENGINE 3 OR 1 INTERCONNECT OUT VALVE FAILS TO OPEN.
 - 5) EITHER MANIFOLD RELIEF SYSTEM FAILS TO RELIEVE.

FAILURES RESULT IN LACK OF DUMP AND RELIEF CAPABILITY. POSSIBLE MANIFOLD RUPTURE CAUSING PROPELLANT LEAKAGE INTO APT COMPARTMENT, OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF ADJACENT CRITICAL FUNCTIONS DUE TO CRYOGENIC EXPOSURE. 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 INTCN VLVS COMPLETE CMD VERIF, V41AAO.020I, V41AAO.040I, V41AAO.060I EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

05-6J-259