

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2151 -2 REV:06/16/88

ASSEMBLY : AFT LCA 1, 2, 3  
 P/N RI : JANTXV1N5551  
 P/N VENDOR:  
 QUANTITY : 6  
 : SIX  
 :

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

CRIT. FUNC: 1R  
 CRIT. HDW: 3

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

PREPARED BY:  
 DES *JWB* J BROWN

APPROVED BY:  
 DES *[Signature]*

APPROVED BY (NASA):  
 EPDC SSM *[Signature]*  
 MPS SSM *[Signature]*  
 EPDC REL *[Signature]*  
 MPS REL *[Signature]*  
 QE *[Signature]*

REL *[Signature]* F DEFENSOR

REL *[Signature]* Kamura 6/27/88

QE *[Signature]* D MASAI

QE *[Signature]* D. Combs 6/27/88

ITEM:

DIODE, BLOCKING (3 AMP), "OUT OPEN" COMMAND, HELIUM INTERCONNECT OUT VALVE OPEN SOLENOID (LV60, 62, 64).

FUNCTION:

ISOLATES MANUAL SWITCH "OUT OPEN" AND MDM "OUT OPEN" COMMANDS FROM EACH OTHER. 54V76A121J1(77), J3(74), 55V76A122J1(77), J3(74). 56V76A123J8(33), (41).

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 ISOLATION BETWEEN MANUAL SWITCH "OUT OPEN" AND MDM "OUT OPEN" COMMANDS.

(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) MANUAL SWITCH BLOCKING DIODE SHORTS (END TO END).
  - 2) ASSOCIATED CONTACTS SHORT TO GROUND RESULTING IN INABILITY TO OPEN ENGINE 1 OR 3 HELIUM INTERCONNECT OUT VALVE.
  - 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 AFT 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. 4 - DIODE, AXIAL LEAD.

(B) GROUND TURNAROUND TEST

HE INTCN VLVS COMPLETE CMD VERIF, V41AAO.020D,F; V41AAO.040D,F;  
V41AAO.060D,F EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.