

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2268 -2 REV:04/25/88

ASSEMBLY : AFT LCA-1	CRIT. FUNC:	1R
P/N RI : JANTXV1N5551	CRIT. HDW:	3
P/N VENDOR:	VEHICLE	102 103 104
QUANTITY : 1	EFFECTIVITY:	X X X
: ONE	PHASE(S):	PL X LO OO DO LS

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <i>JAB</i> J BROWN	DES <i>[Signature]</i>	EPDC SSM <i>[Signature]</i> 1/10/88
REL F DEFENSOR <i>gd</i>	REL <i>[Signature]</i> 5-17-88	MPS SSM <i>[Signature]</i>
QE <i>J.D. Masai</i> D MASAI	QE <i>[Signature]</i> 5-6-88	EPDC REL <i>[Signature]</i> 5/17/88
		MPS REL <i>[Signature]</i> 5/17/88

ITEM: DIODE, BLOCKING (3 AMP), LH2 INBOARD FILL/DRAIN VALVE, OPEN COMMAND A SWITCH BLOCKING.

FUNCTION: ISOLATES MDM OPEN COMMAND A FROM MANUAL SWITCH GROUND AND GROUND OPEN COMMAND. CONDUCTS MANUAL SWITCH OPEN COMMAND AND GROUND OPEN COMMAND TO ONE OF TWO SERIES HDCs FOR CONTROL OF LH2 INBOARD FILL/DRAIN VALVE. 54V76A121CR J3(60).

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) DEGRADATION OF OPEN COMMAND A ISOLATION FROM GROUND OPEN COMMAND. DEGRADATION OF REDUNDANCY AGAINST MAINTAINING THE VALVE OPEN.
- (B) FIRST FAILURE - NO EFFECT.
- (C, D) FIRST FAILURE - NO EFFECT.

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- (E) 1R3, 2 SUCCESS PATHS AFTER FIRST FAILURE. TIME FRAME - PRELAUNCH.
- 1) DIODE SHORTS.
 - 2) MANUAL SWITCH OPEN COMMAND ISOLATION DIODE SHORTS, GROUNDING MDM OPEN COMMAND A AND GROUND OPEN COMMAND CAUSING DEACTUATION OF OPEN SOLENOID. NO EFFECT - BISTABLE FEATURE MAINTAINS FILL/DRAIN VALVE IN OPEN POSITION.
 - 3) INADVERTENT CLOSE COMMAND RESULTING IN CLOSURE OF FILL/DRAIN VALVE.

CLOSURE OF LH2 INBOARD FILL/DRAIN VALVE RESULTS IN TERMINATION OF PROPELLANT LOADING OR DETANKING WHICH MAY CAUSE A PRESSURE SPIKE AND POSSIBLE RUPTURE OF ORBITER FILL LINE, FEED LINE, AND/OR GSE INTERFACE/FACILITY LINES. POSSIBLE AFT COMPARTMENT OVERPRESSURIZATION AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF ADJACENT CRITICAL FUNCTIONS DUE TO CRYO 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

COPPER PATH VERIFICATION, V41AB0.121G EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT: NO CREW ACTION CAN BE TAKEN.

GROUND: NONE.

05-6J-447