

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2002 -2 REV: 04/25/88

ASSEMBLY : AFT PCA-1		CRIT. FUNC: 1R
P/N RI : JANTX1N1204RA		CRIT. HDW: 3
P/N VENDOR:	VEHICLE	102 103 104
QUANTITY : 2	EFFECTIVITY:	X X X
: TWO	PHASE(S):	PL X LO X OO DO LS
:		

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <i>J. Brown</i>	DES <i>R. Brown</i>	EPDC SSM <i>Available for use</i>
REL F DEFENSOR	REL <i>Richard Chilton 5-6-88</i>	MPS SSM <i>5-12-88</i>
QE <i>D Masai</i>	QE <i>R. Cousen 5-6-88</i>	EPDC REL <i>Richard Chilton 5/11/88</i>
		MPS REL <i>Richard Chilton 5/13/88</i>
		QE <i>W. Masai</i>

ITEM:

DIODE, CROSSOVER (12 AMP), LH2 RTLS INBOARD/OUTBOARD DUMP VALVES OPEN SOLENOID (LV72/LV73).

FUNCTION:

PREVENTS SINGLE MDM COMMAND FROM ACTUATING OPEN SOLENOID INADVERTENTLY. 54V76A131A3CR4, A3CR10.

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 REDUNDANCY AGAINST INADVERTENT POWER TO LH2 RTLS DUMP 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 - PRELAUNCH AND ASCENT.
- 1) DIODE SHORTS.
  - 2) OPEN COMMAND B FAILS "ON" CAUSING INADVERTENT ACTUATION OF OPEN SOLENOID. ONE OF THE TWO SERIES DUMP VALVES (PV17/18) INADVERTENTLY OPENS.
  - 3) SERIES LH2 RTLS DUMP VALVE FAILED OPEN.

FAILURE RESULTS IN LH2 LEAKAGE OVERBOARD, CAUSING FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF HELIUM SUPPLY DURING MANIFOLD REPRESSURIZATION RESULTING IN LOSS OF APT COMPARTMENT PURGE (RTLS/TAL ABORT CRITICAL). POSSIBLE LOSS OF CREW/VEHICLE.

A MAXIMUM OF 1800 LBS OF LH2 COULD BE LOST BETWEEN LIFTOFF AND MECO. THIS WOULD NOT AFFECT ENGINE INLET CONDITIONS, BUT WOULD CAUSE A LOW LEVEL CUTOFF (MAY CAUSE ATO OR AOA).

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. 2 - DIODE, POWER-STUD MOUNT.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION V41ABO.180F, V41ABO.190F EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.