

PAGE: 1

PRINT DATE: 03/10/95

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE**

NUMBER: 05-6J-2056A -X

**SUBSYSTEM NAME: EPD&C MAIN PROPULSION SYSTEM**

REVISION:

03/03/95

---

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	: AFT LCA 2	MC450-0058-0001
SRU	: DIODE	JANTXV1N5551

---

**PART DATA**

---

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

| DIODE, BLOCKING (3 AMP) - LH2 OUTBOARD FILL/DRAIN VALVE, MANUAL SWITCH OPEN COMMAND/GROUND OPEN COMMAND

**REFERENCE DESIGNATORS: 55V76A122CRJ3(61)**

**QUANTITY OF LIKE ITEMS: 1**

| ONE PER LH2 OUTBOARD FILL/DRAIN VALVE

**FUNCTION:**

| ISOLATES THE MDM OPEN COMMAND FROM THE MANUAL SWITCH OPEN POSITION, CONDUCTS MANUAL SWITCH OPEN COMMAND AND GROUND OPEN COMMAND TO THE HDC FOR CONTROL OF POWER TO OPEN SOLENOID OF LH2 OUTBOARD FILL/DRAIN VALVE.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2056A -2 REV: 11/20/87

ASSEMBLY : AFT LCA-2		CRIT. FUNC: 1R
P/N RI : JANTKV1N5551		CRIT. HDW: 3
P/N VENDOR:	VEHICLE	102 103 104
QUANTITY : 1	EFFECTIVITY:	X X X
: ONE	PHASE(S):	FL LO X OO OO LS
: 1 PER LH2 OUTBOARD FILL/DRAIN VALVE		

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <i>[Signature]</i> J BROWN	DES <i>[Signature]</i>	EPDC SSM <i>[Signature]</i>
REL <i>[Signature]</i> F DEFENSOR	REL <i>[Signature]</i> 12-5-87	MPS SSM <i>[Signature]</i>
QE D MASAI	QE <i>[Signature]</i>	EPDC REL <i>[Signature]</i>
		MPS REL <i>[Signature]</i>
		QE <i>[Signature]</i>

ITEM:

DIODE, BLOCKING (3 AMP), LH2 OUTBOARD FILL/DRAIN VALVE, MDM OPEN COMMAND BLOCKING.

FUNCTION:

ISOLATES MDM OPEN COMMAND FROM CLOSE SOLENOID INHIBIT, CONDUCTS MANUAL SWITCH OPEN COMMAND AND GROUND OPEN COMMAND TO HDC FOR CONTROL OF POWER TO OPEN SOLENOID OF LH2 OUTBOARD FILL/DRAIN VALVE. 55V76A122CR J3(61).

FAILURE MODE:

SHORT, INTERNAL SHORT, CURRENT LEAKAGE

CAUSE(S):

PIECE PART STRUCTURAL FAILURE, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS.

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

(A) LOSS OF COMMAND ISOLATION. DEGRADATION OF REDUNDANCY AGAINST LOSS OF POWER TO CLOSE SOLENOID.

(B,C,D) NO EFFECT - FIRST FAILURE

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2056A -2 REV:11/20/87

(E) POSSIBLE LOSS OF CREW AND VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - PREMATURE OPEN MDM COMMAND ACTUATING OPEN SOLENOID AND INHIBITING CLOSE SOLENOID CAUSING OUTBOARD VALVE TO OPEN. THIRD FAILURE - LH2 INBOARD FILL/DRAIN VALVE FAILS OPEN) RESULTING IN OVERBOARD LEAKAGE OF LH2. LOSS OF USABLE PROPELLANT WILL LEAD TO A PREMATURE ENGINE CUTOFF. FIRE/EXPLOSIVE HAZARD BOTH INTERIOR AND EXTERIOR TO THE VEHICLE. POSSIBLE UNCONTAINED ENGINE DAMAGE DUE TO PUMP CAVITATION. POSSIBLE VIOLATION OF ET MINIMUM STRUCTURAL REQUIREMENTS DUE TO REDUCED ULLAGE PRESSURE. 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) DISPOSITION AND RATIONALE:

REFER TO APPENDIX F, ITEM NUMBER 4 - DIODE.

(B) GROUND TURNAROUND TEST

COPPER PATH VERIFICATION, V41ABO.111B EVERY FLIGHT

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.