

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2280 -2 REV: 11/19/87
 ASSEMBLY : AFT LCA-2 CRIT. FUNC: 1R
 P/N RI : JANTXVIN5551 CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 2 EFFECTIVITY: X X X
 : TWO PHASE(S): PL X LO X OO DO LS
 : 2 PER LO2 INBOARD FILL/DRAIN VALVE

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

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

ITEM:

DIODE, BLOCKING (3 AMP), LO2 INBOARD FILL/DRAIN VALVE, OPEN SWITCH SCAN.

FUNCTION:

DIODE ISOLATES OPEN SWITCH SCAN SIGNAL FROM THE MANUAL SWITCH OPEN COMMAND. 55V76A122-J3(59), J3(60).

FAILURE MODE:

SHORT, INTERNAL SHORT, CURRENT LEAKAGE

CAUSE(S):

CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS.

EFFECT(S) ON:

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

(A) LOSS OF MANUAL SWITCH OPEN COMMAND ISOLATION. DEGRADATION OF REDUNDANCY AGAINST PREMATURE POWER TO THE OPEN SOLENOID.

(B) NO EFFECT - FIRST FAILURE.

(C,D) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (ROLLER/SPRING OF MANUAL SWITCH BRIDGES ACROSS ONE SET OF OPEN CONTACTS) RESULTING IN PREMATURE OPENING OF FILL/DRAIN VALVE. POTENTIAL WATER HAMMER EFFECT OF APPROXIMATELY 700 PSI (AT 1-G). LO2 FILL/DRAIN LINE IS ONLY CERTIFIED TO WITHSTAND FLIGHT LOADS WHILE EMPTY. FAILURE RESULTS IN POSSIBLE RUPTURE OF THE LO2 FILL LINE, AFT OVERPRESS, AND FIRE/EXPLOSIVE HAZARD. POSSIBLE LOSS OF CRITICAL ADJACENT FUNCTIONS DUE TO CRYO EXPOSURE. DISPLACED GAS MAY ENTER ONE OR MORE SSMEs. POSSIBLE SHUTDOWN OF ONE OR MORE SSMEs. FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE WHILE SWITCH IS IN NOMINAL ASCENT POSITION.

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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 NUMBER 4 - DIODE.

(B) GROUND TURNAROUND TEST

D & C CONTROL BUS REDUNDANCY, V41AFO.010A, B EVERY FLIGHT

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.