

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2133 -1 REV:06/15/88

ASSEMBLY : AFT LCA 3	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 LO X OO DO LS
:	

PREPARED BY:	APPROVED BY:	REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
DES <u>JNB</u> J BROWN	DES <u>A. Burn</u>	APPROVED BY (NASA):
REL <u>glf</u> DEFENSOR	REL <u>J. Kamura 6/27/88</u>	EPDC SSM <u>Available for use 6/27/88</u>
QE <u>DMM D MASAI</u>	QE <u>J. Kamura 6/27/88</u>	MPS SSM <u>Available for use 6/27/88</u>
		EPDC REL <u>Available for use 6/27/88</u>
		MPS REL <u>Available for use 6/27/88</u>
		QE <u>J. Kamura 6/27/88</u>

ITEM:
 DIODE, BLOCKING (3 AMP), LEFT ENGINE PNEUMATIC HELIUM CROSSOVER VALVE POWER CONTROL.

FUNCTION:
 PROVIDES ISOLATION BETWEEN MANUAL SWITCH AND MDM OPEN COMMANDS IN THE LEFT ENGINE PNEUMATIC HELIUM CROSSOVER VALVE CONTROL CIRCUIT.
 56V76A123J1(77), J3(74).

FAILURE MODE:
 OPEN, FAILS TO CONDUCT.

CAUSE(S):
 STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

(A) LOSS OF MANUAL SWITCH OR MDM OPEN COMMAND.
 (B) INABILITY TO OPEN LEFT ENGINE PNEUMATIC CROSSOVER VALVE (LV10).
 (C,D) NO EFFECT - FIRST FAILURE.

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(E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.

TIME FRAME - ENGINE OPERATION.

1) HELIUM LEAK DOWNSTREAM OF CHECK VALVE CV9 (ASSUMES LEAK RATE IS LARGE ENOUGH TO DEplete PNEUMATIC SUPPLY BUT LESS THAN REQUIRED TO OVERPRESSURIZE THE AFT COMPARTMENT).

2) DIODE FAILS OPEN, CAUSING HELIUM CROSSOVER VALVE TO REMAIN CLOSED WHEN CREW MANUALLY COMMANDS LV10 OPEN IN RESPONSE TO FIRST FAILURE PRIOR TO MECO.

LOSS OF PNEUMATIC ACTUATION HELIUM RESULTS IN LO2 PREVALVE FAILING TO CLOSE AND INABILITY TO MAINTAIN INJECTED HELIUM AND LO2 PRESSURE TO THE HIGH PRESSURE OXYGEN TURBOPUMP TO PREVENT PUMP OVERSPEED AND CAVITATION AT MECO. RESULTS IN UNCONTAINED ENGINE DAMAGE, AFT COMPARTMENT OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF CREW/VEHICLE.

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

COMPLETE ELECTRICAL VERIFICATION, V41AAO.160 EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

05-6J-243