

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2319 -2 REV:06/16/88

ASSEMBLY : AFT LCA-2
 P/N RI : JANTXV1N5551
 P/N VENDOR:
 QUANTITY : 2
 : TWO
 :

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL	LO X OO	DO LS

CRIT. FUNC: 1R
 CRIT. HDW: 2

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <u>JMB</u> J BROWN	DES <u>J. Brown</u>	EPDC SSM <u>[Signature]</u> 5/17/88
REL <u>gdf</u> DEFENSOR	REL <u>J. Kamura</u> 6/27/88	MPS SSM <u>[Signature]</u> 6/23/88
QE <u>Dum</u> D MASAI	QE <u>J.J. Cameron</u> 6/27/88	EPDC REL <u>[Signature]</u> 6/27/88
		MPS REL <u>[Signature]</u>
		QE <u>[Signature]</u> 6/27/88

ITEM:
 DIODE, BLOCKING (3 AMP), LH2 HELIUM MANIFOLD REPRESSURIZATION VALVES
 (LV 42, 43), OPEN SWITCH SCAN.

FUNCTION:
 ISOLATES CONTROL BUSES IN THE "OPEN" SWITCH SCAN CIRCUIT.
 55V76A122J3(82), J3(84).

FAILURE MODE:
 SHORTS (END TO END).

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

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

(A) LOSS OF CONTROL BUS ISOLATION.
 (B,C,D) NO EFFECT - FIRST FAILURE.

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- (E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.
TIME FRAME - ASCENT.
1) DIODE SHORTS (END TO END).
2) CONTACT TO CONTACT SHORT OF PARALLEL SET OF "OPEN" CONTACTS
CAUSING TWO SERIES LH2 HELIUM MANIFOLD REPRESSURIZATION VALVES
(LV 42, 43) TO OPEN.

REPRESS REGULATOR (PR6) DOES NOT PROVIDE REDUNDANT HELIUM ISOLATION SINCE
REGULATOR CONTROLS TO A MANIFOLD PRESSURE OF 17-30 PSIG AND THE MANIFOLD
PRESSURE DURING ASCENT IS IN THIS RANGE. RESULTS IN HELIUM ENTERING THE
FEEDLINE MANIFOLD. THIS MAY CAUSE MULTIPLE UNCONTAINED ENGINE FAILURES
DUE TO HELIUM BUBBLE INGESTION AND TURBOPUMP CAVITATION. 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

COMPLETE ELECTRICAL VERIFICATION, V41AAG.100I,J EVERY FLIGHT.

(E) OPERATIONAL USE

PNEUMATIC ACTUATION HELIUM BOTTLE PRESSURE IS ON A DEDICATED DISPLAY IN
COCKPIT. CREW ACTION IS TO FOLLOW NORMAL LEAK ISOLATION PROCEDURE.
PRIOR TO MECO, ISOLATION VALVES (LV7, LV8) WILL BE REOPENED AND THE LEFT
ENGINE HELIUM CROSSOVER VALVE (LV10) WILL BE OPENED.

EFFECTIVE FOR OI-8D SOFTWARE, CR 89397B "MPS PNEUMATIC SYSTEM FDA AND
DISPLAY - BFS" ADDS PNEUMATIC TANK, REGULATOR, AND ACCUMULATOR PRESSURE
TO THE S/M ALERT FDA SYSTEM AND ADDS THE 3 PRESSURE MEASUREMENTS TO THE
BFS SYSTEM SUMMARY DISPLAY. THIS ALLOWS THE FLIGHT CREW TO RESPOND TO A
PNEUMATIC HELIUM SYSTEM LEAK INDEPENDENT OF GROUND CONTROL.