SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2314 -2 REV:06/17/88

ASSEMBLY :AFT LCA-3
P/N RI :JANTXV1N5551
P/N VENDOR:
QUANTITY :2
:TWO
:

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL LO X OO DO LS

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

PREPARED BY:
DES J BROWN
REL F DEFENSOR
QE D MASAI

APPROVED BY:
DES
REL 6/29/88
QE 6/27/88

APPROVED BY (NASA):
EPDC SSM 6/27/88
MPS SSM
EPDC REL 6/27/88
MPS REL
QE

ITEM:
DIODE, BLOCKING (3 AMP), LO2 HELIUM MANIFOLD REPRESSURIZATION VALVES (LV 40, 41), OPEN SWITCH SCAN.

FUNCTION:
ISOLATES CONTROL BUSES IN THE "OPEN" SWITCH SCAN CIRCUIT. 56V76A123J3(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.

(E) 1R/3, 2 SUCCESS PATHS 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 LO2 HELIUM MANIFOLD REPRESSURIZATION VALVES (LV 40, 41) TO OPEN.
3) LO2 REPRESS REGULATOR (PR5) FAILS WIDE OPEN (MAXIMUM FLOW).

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, V41AA0.090I,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.