SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2145 -2 REV:06/16/88

ASSEMBLY :MID PCA-1, 2, 3
P/N RI :JANTXV1N4246
P/N VENDOR:
QUANTITY :6
:SIX
:

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 J Kamura 6/27/88
QE 90. Conner 6/27/88

APPROVED BY (NASA):
EPDC SSM
MPS SSM
EPDC REL
MPS REL
QE

ITEM:
DIODE, BLOCKING (1 AMP), MANUAL SWITCH "IN OPEN" COMMAND, HELIUM INTERCONNECT IN VALVE OPEN SOLENOID (LV59, 61, 63).

FUNCTION:
ISOLATES MANUAL SWITCH "IN OPEN" COMMAND FROM MDM "IN OPEN" COMMAND. 40V76A25A6CR3, CR6. 40V76A26A5CR3, CR6. 40V76A27A5CR3, CR6.

FAILURE MODE:
SHORT (END TO END).

CAUSE(S):
STRUCTURAL FAILURE (MECHANICAL STRESS, 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 ISOLATION BETWEEN MANUAL SWITCH "IN OPEN" COMMAND AND MDM "IN OPEN" COMMAND.

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

(E) 1R/3, 3 SUCCESS PATHS AFTER FIRST FAILURE.
TIME FRAME - ASCENT.
1) DIODE SHORTS (END TO END).
2) ASSOCIATED CONTACTS SHORT TO GROUND, RESULTING IN LOSS OF ONE OF TWO POWER PATHS TO OPEN SOLENOID.
3) LOSS OF PARALLEL POWER PATH TO OPEN SOLENOID, CAUSING IN VALVE TO CLOSE.
4) ENGINE HELIUM SYSTEM LEAK (ASSUMES RATE SUCH THAT DEPLETION OCCURS SIMULTANEOUS WITH MECO).

RESULTS IN INTERRUPTION OF ENGINE HELIUM PURGE AND FAILURE 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.

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. 3 - DIODE, AXIAL LEAD.

(B) GROUND TURNAROUND TEST
HE INTCN VLVS COMPLETE CMD VERIF, V41AA0.020B,C V41AA0.040B,C V41AA0.060B,C EVERY FLIGHT.

(E) OPERATIONAL USE
NO CREW ACTION CAN BE TAKEN.