SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2191 -1 REV:11/04/87

ASSEMBLY :D & C PANEL R4 CRIT. FUNC: 1R
P/N RI :JANTXV1N4246 CRIT. HDW: 3
P/N VENDOR:
QUANTITY :12
:TWELVE
:4 PER PREVALVE 1, 2,& 3

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL X LO X CO DO LS

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

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

APPROVED BY:
DES
REL 12-5-87
QE 11/5/87

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

ITEM:
DIODE BLOCKING (1 AMP), SWITCH GROUND DIODE (CLOSE SIDE), LO2 PREVALVES 1, 2, & 3.

FUNCTION:
ISOLATES CLOSE POLES FROM CENTER POLE (GPC), WHICH IS GROUNDED, IN THE LO2 PREVALVES 1, 2, & 3 CONTROL AND POWER CIRCUITS. PROTECT AGAINST INADVERTENT CLOSE COMMANDS. (SWITCHES S11, S12, & S13). 32V73A4 - P1(34), (36), (38), - P2(34), (36), (38), - P3(34), (36), (38), - P5(17), (19), (21).

FAILURE MODE:
OPENS, FAILS OPEN, FAILS TO CONDUCT

CAUSE(S):
CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS.

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

(A) LOSS OF CAPABILITY TO GROUND INADVERTENT CLOSE COMMAND. DEGRADATION OF REDUNDANCY AGAINST PREMATURE CLOSURE OF LO2 PREVALVE.

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - ROLLER/SPRING BREAKS. ONE PARTICLE BRIDGES CLOSE CONTACTS OF POLE WITH FAILED DIODE. SECOND PARTICLE BRIDGES CLOSE CONTACTS OF FAILED POLE. THIS RESULTS IN TWO INADVERTENT CLOSE COMMANDS INHIBITING OPEN SOLENOID POWER, MAINSTAGE COMMAND INHIBITS COMMAND TO CLOSE SOLENOID. THIRD FAILURE - LOSS OF MAINSTAGE COMMAND) RESULTING IN PREMATURE LO2 PREVALVE CLOSURE WHILE ENGINE IS RUNNING. UNCONTAINED ENGINE DAMAGE DUE TO STARVATION CUTOFF. FAILS A AND B SCREENS BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE - REQUIRES INVASIVE TESTING. NOTE - BISTABLE FEATURE NOT DEMONSTRATED BY TEST (CERTIFIED BY ANALYSIS). A FULL FLOW DETENT VERIFICATION TEST IS SCHEDULED FOR GFY 1988.

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.

(B) GROUND TURNAROUND TEST
UNDETECTABLE - REQUIRES INVASIVE TESTING.

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