SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2188 -2 REV:11/04/87

ASSEMBLY :AFT LCA-1, 2,& 3, AV BAY 4, 5,& 6 DIODE BOX CRIT. FUNC: 1R
P/N RI :JANTXV1N5551 CRIT. HDW: 3
P/N VENDOR:

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X

QUANTITY :12
:TWELVE
:4 PER PREVALVE 1, 2,& 3

PHASE(S): PL X 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 12-5-87
QE DM 4/5/

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

ITEM:
DIODE, BLOCKING (3 AMP), CLOSE SWITCH, HYBRID DRIVER COMMAND, LO2 PREVALVE 1, 2, & 3.

FUNCTION:
DIODE ISOLATES MDM COMMAND FROM MANUAL SWITCH, CONDUCTS SWITCH COMMAND TO HYBRID DRIVER CONTROLLER FOR CONTROL OF REDUNDANT POWER TO CLOSE SOLENOID FOR LO2 PREVALVE OPERATION. AV BAY 4, P140(74), (120); AV BAY 5, P140(60), (110); AV BAY 6, P140(103), (110); 56V76A123-J3(51), (48); 54V76A121-J3(48), (51); 55V76A122-J3(51), (48).

FAILURE MODE:
SHORTS, INTERNAL SHORTS, CURRENT LEAKAGE

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

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

(A) GROUNDING OF MDM CLOSE COMMAND THROUGH SWITCH GROUNDING DIODE RESULTING IN THE LOSS OF ONE OF TWO POWER PATHS TO CLOSE SOLENOID.

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - LOSS OF SECOND POWER PATH TO CLOSE SOLENOID, REDUNDANT CLOSE SOLENOID PERFORMS FUNCTION. THIRD FAILURE - FAILURE OF REDUNDANT CLOSE SOLENOID) RESULTING IN UNCONTAINED ENGINE DAMAGE DUE TO FAILURE TO CLOSE LO2 PREVALVE AT MECO + 1.158 SECONDS. PREVALVE CLOSURE REQUIRED TO MAINTAIN NET POSITIVE SUCTION PRESSURE ON SSME HIGH PRESSURE OXIDIZER TURBOPUMP. FAILS B SCREEN BECAUSE REDUNDANT POWER PATH MASKS FAILURE.

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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.

(B) GROUND TURNAROUND TEST
MDM COMMAND REDUNDANCY, V41AE0.380L, P, S; 400L, P, S; 420L, P ,S
EVERY FLIGHT.

(E) OPERATIONAL USE
FLIGHT - NO CREW ACTION CAN BE TAKEN.
GROUND - IF A MAJOR LEAK IS DETECTED, CLOSE PREVALVES (PV1, 2, 3), LO
17-INCH DISCONNECT (PD1); DRAIN MANIFOLD.

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