

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2183 -1 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  
QUANTITY : 9 EFFECTIVITY: X X X  
:NINE PHASE(S): PL X LO X OO DO LS  
:3 PER PREVALVE 1, 2, & 3

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

PREPARED BY: APPROVED BY: APPROVED BY (NASA):  
DES J BROWN DES *J. Brown* EPDC SSM *J. Brown*  
REL F. DEFENSOR REL *F. Defensor* MPS SSM *F. Defensor*  
QE D MASAI QE *D. Masai* EPDC REL *D. Masai*  
MPS REL *D. Masai*

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

FUNCTION:  
DIODE ISOLATES MANUAL SWITCH COMMAND FROM MDM, CONDUCTS MDM COMMAND TO HYBRID DRIVER CONTROLLER FOR CONTROL OF REDUNDANT POWER TO CLOSE SOLENOIDS FOR LO2 PREVALVE OPERATION. AV BAY 4, P140(72) & (103); BAY 5 P140(51) & (98); BAY 6, P140(120) & (98); 56V76A123-J1(38), 54V76A121-J1(38), 55V76A122-J1(38)

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 ONE OF TWO POWER PATHS TO CLOSE SOLENOIDS.  
(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, V41AEO.380L,P; 400L,P; 420L,P EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

GROUND - IF A MAJOR LEAK IS DETECTED, CLOSE PREVALVES (PV1, 2, 3), LO2  
17-INCH DISCONNECT (PD1); DRAIN MANIFOLD.

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