

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2288 -1 REV:11/19/87

ASSEMBLY : AFT BAY 5 DIODE BOX CRIT. FUNC: 1R  
 P/N RI : JANTXV1N5551 CRIT. HDW: 2  
 P/N VENDOR: VEHICLE 102 103 104  
 QUANTITY : 1 EFFECTIVITY: X X X  
 : ONE PHASE(S): PL X LO CO DO LS  
 : 1 PER LO2 INBOARD FILL/DRAIN VALVE

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS  
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):  
 DES J BROWN DES [Signature] EPDC SSM [Signature]  
 REL F DEFENSOR REL [Signature] 12-5-87 MPS SSM [Signature]  
 QE D MASAI QE [Signature] EPDC REL [Signature]  
 MPS REL [Signature] QE [Signature]  
 1/4/88

ITEM:  
 DIODE, BLOCKING (3 AMP), LO2 INBOARD FILL/DRAIN VALVE, GROUND OPEN COMMAND OUTPUT.

FUNCTION:  
 ISOLATES MANUAL SWITCH OPEN COMMAND FROM GROUND OPEN COMMAND, CONDUCTS GROUND OPEN COMMAND TO ONE OF THE TWO SERIES HDCs FOR CONTROL OF POWER TO THE OPEN SOLENOID AND PROVIDES INHIBIT TO CLOSE SOLENOID HDC OF THE LO2 INBOARD FILL/DRAIN VALVE. 55V76A208A2CR20.

FAILURE MODE:  
 OPEN, 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  
 (A) LOSS OF CLOSE SOLENOID INHIBIT DUE TO LOSS OF GROUND OPEN COMMAND. DEGRADATION OF REDUNDANCY AGAINST PREMATURE DEACTUATION OF OPEN SOLENOID AND PREMATURE ACTUATION OF CLOSE SOLENOID.  
 (B,C,D) FIRST FAILURE - NO EFFECT. POSSIBLE LOSS OF CREW AND VEHICLE AFTER SECOND FAILURE (ROLLER/SPRING OF THE MANUAL SWITCH BREAKS AND SHORTS ACROSS A SET OF CLOSE CONTACTS INHIBITING THE OPEN SOLENOID AND PREMATURELY ACTUATING THE CLOSE SOLENOID) RESULTING IN PREMATURE CLOSURE OF FILL/DRAIN VALVE. TERMINATION OF PROPELLANT LOADING WHICH MAY CAUSE A PRESSURE SPIKE AND POSSIBLE RUPTURE OF ORBITER FILL LINE AND/OR GSE INTERFACE/FACILITY LINES. POSSIBLE AFT COMPARTMENT OVERPRESSURIZATION AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF ADJACENT CRITICAL FUNCTIONS DUE TO CRYO EXPOSURE.

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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 NUMBER 4 - DIODE.

(B) GROUND TURNAROUND TEST

MDM COPPER/COMMAND PATH VERIFICATION, V4LAB0.101B EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

GROUND - TERMINATE LOADING.

05-6J-481