

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2281 -2 REV: 11/19/87

ASSEMBLY : AV 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 OO 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] 11-5-87 MPS SSM [Signature]
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 MPS REL [Signature] QE [Signature]

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

FUNCTION:
 DIODE ISOLATES GROUND OPEN COMMAND FROM THE MANUAL SWITCH GROUND,
 CONDUCTS MANUAL SWITCH OPEN COMMAND TO ONE OF TWO HDC ILS FOR CONTROL OF
 POWER TO OPEN SOLENOID OF LO2 INBOARD FILL/DRAIN VALVE. 55V76A208A2CR13.

FAILURE MODE:
 SHORT, INTERNAL SHORT, CURRENT LEAKAGE

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

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

(A) GROUNDING OF GROUND OPEN COMMAND RESULTING IN THE LOSS OF THE CLOSE
 SOLENOID INHIBIT. DEGRADATION OF REDUNDANCY AGAINST PREMATURE POWER TO
 CLOSE SOLENOID.

(B) NO EFFECT - FIRST FAILURE.

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(C,D) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER THE SECOND FAILURE (ROLLER/SPRING OF MANUAL SWITCH BRIDGES ACROSS CLOSE CONTACT PROVIDING INADVERTENT CLOSE COMMAND AND OPEN INHIBIT COMMAND) 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. NOTE - DURING VACUUM INERT THIS FAILURE MODE IS 1R3 (FIVE SUCCESS PATHS AFTER FIRST FAILURE) AND FAILS THE B SCREEN SINCE GROUND OPEN COMMAND IS OFF DURING FLIGHT.

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 COMMAND/COPPER PATH VERIFICATION, V41ABO.101B EVERY FLIGHT

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

GROUND - TERMINATE LOADING.

05-6J-467