

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2187 -2 REV:11/04/87

ASSEMBLY : AFT LCA-1, 2, & 3, AV BAYS-4, 5, & 6 DIODE BOX CRIT. FUNC: 1R
 P/N RI : JANTXVIN5551 CRIT. HDW: 3
 P/N VENDOR:
 QUANTITY : 12 VEHICLE 102 103 104
 EFFECTIVITY: X X X
 : TWELVE PHASE(S): PL X LO X OO DO LS
 : 4 PER PREVALVE 1, 2, & 3

REDUNDANCY SCREEN: A-PASS B-FAIL 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]* 1/5/87 MPS REL *[Signature]*
 QE *[Signature]* 1/5/87

ITEM:

DIODE, BLOCKING (3 AMP), OPEN SWITCH, HYBRID DRIVER CONTROLLER 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 OPEN SOLENOIDS FOR LO2 PREVALVE OPERATION. 54V76A121 J3(46), (52); 55V76A122 J3(46), (52); 56V76A123 J3(46), (52); AV BAY 4 P140 (78), (108); AV BAY P140 (54), (95); AV BAY 6 P140 (64), (81).

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 OPEN COMMAND THROUGH SWITCH GROUNDING DIODE RESULTING IN THE LOSS OF ONE OF TWO POWER PATHS TO OPEN 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 OPEN SOLENOID, BISTABLE FEATURE MAINTAINS PREVALVE IN OPEN POSITION. THIRD FAILURE - PREMATURE ACTUATION OF CLOSE SOLENOID) RESULTING IN PREMATURE LO2 PREVALVE CLOSURE WHILE ENGINE IS RUNNING. UNCONTAINED ENGINE DAMAGE DUE TO STARVATION CUTOFF. FAILS B SCREEN BECAUSE REDUNDANT POWER PATH MASKS FAILURE. NOTE - BISTABLE FEATURE NOT DEMONSTRATED BY TEST (CERTIFIED BY ANALYSIS). A FULL FLOW DETENT VERIFICATION TEST IS SCHEDULED FOR GFY 1988.

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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.380B,F,H,J; 400B,F,H,J; 420B,F,H,J
EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

05-6J-292