

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2189 -2 REV:11/04/8

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 : 12 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-PAS:
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES J BROWN DES [Signature] EPDC SSM [Signature]
 REL F DEFENSOR REL [Signature] 12-5-87 EPDC REL [Signature]
 QE D MASAI QE [Signature] MPS REL [Signature]

ITEM:

DIODE BLOCKING (3 AMP), OPEN SWITCH, MAINSTAGE COMMAND, LO2 PREVALVE 1, 2, & 3.

FUNCTION:

DIODE ISOLATES MDM MAINSTAGE COMMAND FROM MANUAL SWITCH, CONDUCTS SWITCH COMMAND TO INHIBIT THE CLOSING HYBRID DRIVER CONTROLLER FOR CONTROL OF REDUNDANT POWER TO CLOSE SOLENOID FOR LO2 PREVALVE OPERATION. AV BAY 4, P140(92), (97); AV BAY 5, P140(87), (97); AV BAY 6, P140(100), (112); 56V76A123-J3(46), (52); 55V76A122-J3(46), (52); 54V76A121-J3(46), (52).

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 MAINSTAGE MDM COMMAND THROUGH SWITCH GROUNDING DIODE, RESULTING IN DEGRADATION OF REDUNDANCY AGAINST PREMATURE CLOSURE OF LO2 AND LH2 PREVALVES.

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

05-6J-295

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(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER FOURTH FAILURE (SECOND FAILURE - HDC I FAILS ON, SERIES RPC PREVENTS PREMATURE COMMAND TO CLOSE SOLENOID. THIRD FAILURE - RPC FAILS ON RESULTING IN PREMATURE COMMAND TO CLOSE SOLENOID, OPEN SOLENOID MAINTAINS PREVALVE IN OPEN POSITION. FOURTH FAILURE - PREMATURE DEACTUATION OF OPEN SOLENOID) RESULTING IN PREMATURE LO2 PREVALVE CLOSURE WHILE ENGINE IS RUNNING. UNCONTAINED ENGINE DAMAGE DUE TO STARVATION CUTOFF. FAILS B SCREEN BECAUSE MAINSTAGE COMMANDS ARE NOT INSTRUMENTED. NOTE - BISTABLE FEATURE NOT DEMONSTRATED BY TEST (CERTIFIED BY ANALYSIS). A FULL FLOW DETENT VERIFICATION TEST IS SCHEDULED FOR GFY 1988.

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
PREVALVE CLOSE INHIBIT REDUNDANCY VERIFICATION AGO.070A-D, 80A-D,
90A-D EVERY FLIGHT.

(E) OPERATIONAL USE
NO CREW ACTION CAN BE TAKEN.

05-6J-296