

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PRCP. FMEA NO 05-6J -2079 -1 REV:11/19/87

ASSEMBLY : AFT LCA-1, 2, & 3 CRIT. FUNC: 1R
 P/N RI : MC477-0261-0002 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 3 EFFECTIVITY: X X X
 : THREE PHASE(S): PL X LO X OO DO LS
 : 1 PER PREVALVE 1, 2, & 3

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

PREPARED BY: DES J BROWN *JTB* APPROVED BY: DES *[Signature]* APPROVED BY (NASA):
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ITEM:

CONTROLLER, HYBRID DRIVER (HDC), TYPE I, LO2 PREVALVE 1, 2, & 3, CONTROL POWER FOR OPEN SOLENOID.

FUNCTION:

CONDUCTS MDM OPEN COMMAND TO TYPE III HDC. LEFT OVER FROM PREVIOUS CIRCUIT CONFIGURATION, COULD BE REPLACED BY A WIRE AND DIODE. 54V76A121AR (J1-33), 55V76A122AR (J1-33), 56V76A123AR (J1-33).

FAILURE MODE:

LOSS OF OUTPUT, FAILS OPEN, FAILS TO CONDUCT.

CAUSE(S):

PIECE PART FAILURE, CONTAMINATION, THERMAL STRESS, MECHANICAL SHOCK, VIBRATION.

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

(A) LOSS OF ONE OF TWO POWER PATHS TO OPEN SOLENOID.

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

(E) POSSIBLE LOSS OF CREW AND VEHICLE AFTER THE 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 B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER.

(B) GROUND TURNAROUND TEST

MDM COMMAND REDUNDANCY, V41AEO.380B; 400B; 420B EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.