

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2073 -1 REV:11/04/87
 ASSEMBLY : AFT LCA-1, 2, & 3 CRIT. FUNC: 1R
 P/N RI : MC477-0261-0002 CRIT. HDW: 3
 P/N VENDOR:
 QUANTITY : 3 VEHICLE 103 103 104
 : THREE EFFECTIVITY: X X X
 : 1 PER PREVALVE 1, 2, & 3. PHASE(S): PL X LO X CO DO LS

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]* MPS SSM *[Signature]*
 QE D MASAI QE *[Signature]* EPDC REL *[Signature]*
 MPS REL *[Signature]*
 QE *[Signature]* QE *[Signature]*

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

FUNCTION:
 CONDUCTS MDM CLOSE COMMAND TO TYPE III HDC. LEFT OVER FROM PREVIOUS CIRCUIT CONFIGURATION, COULD BE REPLACED BY A WIRE AND DIODE. 54V76A121AR (J1-36), 55V76A122AR(J1-36), 56V76A123AR(J1-36).

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 CLOSE 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 CLOSE SOLENOID, REDUNDANT SOLENOID PERFORMS FUNCTION; THIRD FAILURE - FAILURE OF REDUNDANT SOLENOID) RESULTING IN UNCONTAINED ENGINE DAMAGE DUE TO FAILURE TO CLOSE LO2 PREVALVE AT MECO + 1.158 SECONDS. PREVALVE CLOSURE REQUIRED TO MAINTAIN NET POSITIVE SUCTION PRESSURE ON SSME HIGH PRESSURE OXIDIZER TURBOPUMP. FAILS B SCREEN BECAUSE REDUNDANT POWER PATH MASKS FAILURE.

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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, VALAEO.380L; 400L; 420L EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

GROUND - IF A MAJOR LEAK IS DETECTED, CLOSE PREVALVES (PV1, 2, 3), LO2
17-INCH DISCONNECT (PD1); DRAIN MANIFOLD.