

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2202 -2 REV: 11/04/97

ASSEMBLY : AFT LCA-1, 2, & 3 CRIT. FUNC: 1R
 P/N RI : MC477-0263-0002 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 6 EFFECTIVITY: X X X
 : SIX PHASE(S): PL X LO X OO DO LS
 : 2 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 EPDC REL [Signature]
 QE D MASAI QE DM. [Signature] MPS REL [Signature]
[Signature]

ITEM:
 HYBRID DRIVER CONTROLLER (HDC), TYPE III, LH2 PREVALVE 1, 2, & 3, CONTR. POWER FOR OPEN SOLENOID.

FUNCTION:
 PROVIDES GPC AND MANUAL CONTROL OF POWER TO OPEN SOLENOID FOR EACH LH2 PREVALVE 1, 2, & 3. HDC IS IN SERIES WITH A RPC. NOTE - HDC IDENTIFIED BY LCA INPUT PINS. 54V76A121AR-J3(38), (42); 55V76A122AR-J3(38), (42); 56V76A123AR-J3(38), (42).

FAILURE MODE:
 INADVERTENT OUTPUT, CONDUCTS PREMATURELY, INTERNAL SHORTS

CAUSE(S):
 PIECE PART FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS

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

(A) DEGRADATION OF REDUNDANCY AGAINST PREMATURE OPEN SOLENOID POWER.

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - SERIES RPC FAILS ON. THIRD FAILURE - SSME SHUTDOWN WITH UNCONTAINED DAMAGE REQUIRING LH2 PROPELLANT SUPPLY ISOLATION) DUE TO INABILITY TO CLOSE LH2 PREVALVE. FAILS B SCREEN BECAUSE SERIES/PARALLEL CIRCUIT REDUNDANCY.

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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.180A; 200A; 220A EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN

GROUND - IF A MAJOR LEAK IS DETECTED, CLOSE PREVALVES (PV4, 5, 6), LH2
17-INCH DISCONNECT (PD2), LH2 4-INCH RECIRC DISCONNECT (PD3), LH2
RECIRC VALVES (PV14-16); DRAIN MANIFOLD.

05-6J-314