

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2301 -2 REV:06/15/88

ASSEMBLY : AFT LCA 1 & 22 CRIT. FUNC: 1R
 P/N RI : MC477-0263-0002 CRIT. HDW: 2
 P/N VENDOR: VEHICLE: 102 103 104
 QUANTITY : 2 EFFECTIVITY: X X X
 : TWO PHASE(S): PL LO X OO DO LS
 :

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

PREPARED BY: APPROVED BY: APPROVED BY (NASA);
 DES *J Brown* J BROWN DES *J Brown* EPDC SSM *Approved pending for a.c. study 6/27/88*
 REL *J F DEFENSOR* DEFENSOR REL *J Kamura 6/27/88* MPS SSM *Approved 6/28/88*
 QE *DNM D MASAI* D MASAI QE *Ed. Lawson 6/27/88* EPDC RPT *Approved 7/1/88*
 MPS RPT *Approved 6/30/88*

ITEM:
 CONTROLLER, HYBRID DRIVER (HDC), TYPE III, PNEUMATIC HELIUM SUPPLY ISOLATION VALVES NO. 1 AND 2 (LV7/8) CONTROL CIRCUIT.

FUNCTION:
 CONDUCTS POWER TO CONTROL SOLENOID OF PNEUMATIC HELIUM SUPPLY ISOLATION VALVE. 54V76A12LJ3(80), 55V76A122J3(80).

FAILURE MODE:
 INADVERTENT OUTPUT, FAILS "ON", FAILS TO TURN "OFF".

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

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY
 (A) CONTINUOUS POWER TO ONE OF TWO PARALLEL PNEUMATIC HELIUM SUPPLY ISOLATION VALVE SOLENOIDS.
 (B,C,D) NO EFFECT - FIRST FAILURE.

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(E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.
TIME FRAME - ASCENT.

- 1) HELIUM LEAK BETWEEN ISOLATION VALVE AND DOWNSTREAM CHECK VALVE
(ASSUMES LEAK RATE IS NOT LARGE ENOUGH TO OVERPRESSURIZE AFT
COMPARTMENT BEFORE CREW CAN RESPOND).
- 2) HDC FAILS "ON".

RESULTS IN NON-ISOLATABLE LEAKAGE FROM THE PNEUMATIC HELIUM SUPPLY.
POSSIBLE OVERPRESSURIZATION OF AFT COMPARTMENT SINCE ISOLATION OF THE
LINE CANNOT BE ACHIEVED WITHIN THE AVAILABLE RESPONSE TIME. POSSIBLE
LOSS OF CREW/VEHICLE.

FAILS B SCREEN BECAUSE FAILURE IS NOT DETECTABLE DURING CRITICAL PERIOD
(ENGINE OPERATION) WHILE HDC IS COMMANDED "ON".

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

COMPLETE ELECTRICAL VERIFICATION, V41AAO.070A EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.