

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2038 -1 REV: 04/25/88

ASSEMBLY : D & C PANEL R4 CRIT. FUNC: 1R
 P/N RI : ME452-0102-7356 CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 1 EFFECTIVITY: X X X
 : ONE PHASE(S): PL LO X OO DO IS
 :

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES J. BROWN DES A. Brown EPDC SSM isidell Adams J. Brown 5-6-88
 REL F DEFENSOR gd REL Michael P. H. 5-6-88 MPS SSM 5-17-88
 QE D. Masai QE J. Coulsen 5-6-88 EPDC REL 5-17-88
 MPS REL 5-17-88
 QE Y. Masai

ITEM:
 TOGGLE SWITCH (THREE POLES, THREE POSITIONS, LEVER LOCKED), LH2 INBOARD FILL/DRAIN, TOPPING, AND HIGH POINT BLEED VALVES. (PV12, 13, 22).

FUNCTION:
 PROVIDES MANUAL CONTROL OF POWER TO LH2 INBOARD FILL/DRAIN, TOPPING, AND HIGH POINT BLEED VALVES. 32V73A4S9.

FAILURE MODE:
 FAILS OPEN, SHORT-TO-CASE (GROUND) - "OPEN" COMMAND CONTACTS.

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

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

- (A) LOSS OF SWITCH TRANSFER FUNCTION.
- (B) LOSS OF MANUAL CAPABILITY TO CONTROL FILL/DRAIN, TOPPING, AND HIGH POINT BLEED VALVES. NOTE - SEQUENCING DURING VACUUM INERT IS BY MANUAL SWITCH COMMAND.
- (C,D) FIRST FAILURE - NO EFFECT.

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- (E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.
TIME FRAME - LH2 VACUUM INERT.
1) SWITCH FAILS OPEN OR SHORT-TO-CASE (GROUND) CAUSING INABILITY TO OPEN INBOARD FILL/DRAIN VALVE (PV12).
2) RELIEF SHUTOFF VALVE (PVB) FAILS TO OPEN/REMAIN OPEN.

RESULTS IN LACK OF RELIEF CAPABILITY. POSSIBLE RUPTURE OF THE LH2 MANIFOLD CAUSING LH2 LEAKAGE INTO AFT COMPARTMENT, OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF CRITICAL ADJACENT COMPONENTS DUE TO CRYOGENIC EXPOSURE. POSSIBLE LOSS OF CREW VEHICLE.

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE:

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

(B) GROUND TURNAROUND TEST

COPPER PATH VERIFICATION V41ABO.121D,F; V41ABO.131C,D EVERY FLIGHT.

(E) OPERATIONAL USE

FOR OPS 1 VACUUM INERT OPERATIONS, THE CREW WOULD BE DIRECTED TO OPEN THE RTLS DUMP VALVES ON GROUND CALL.