

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2198 -2 REV: 11/04/87
 ASSEMBLY : D & C PANEL R4 ABORT: ALL
 P/N RI : ME452-0102-7354 CRIT. FUNC: 1R
 P/N VENDOR: CRIT. HDW: 2
 QUANTITY : 3 VEHICLE 102 103 104
 : THREE EFFECTIVITY: X X X
 : 1 PER PREVALVE 1, 2, & 3 PHASE(S): PL X LO X OO DO LS

REDUNDANCY SCREEN: A-PASS B-PASS 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]*

ITEM:
 TOGGLE SWITCH, 3 POLE/3 POSITION, CENTER LEVER LOCK, LH2 PREVALVES 1, 2 & 3 MANUAL CONTROL POWER.

FUNCTION:
 PROVIDES MANUAL CONTROL OF LH2 PREVALVE. SOFTWARE CONTROLS NORMAL PREVALVE FUNCTIONS. 32V73A4S14, 15, 16.

FAILURE MODE:
 FAILS CLOSED, INTERNAL PIECE PART FAILURE, OPEN POSITION CONTACTS FAIL CLOSED, POLE-TO-POLE SHORT

CAUSES:
 PIECE PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
 (A) ROLLER/SPRING BRIDGES TWO OPEN CONTACTS PROVIDING TWO INADVERTENT OPEN COMMANDS AND TWO CLOSE INHIBITS, RESULTING IN PREMATURE POWER TO OPEN SOLENOID OF LH2 PREVALVE.
 (B) LOSS OF CAPABILITY TO CLOSE LH2 PREVALVE.
 (C,D) FIRST FAILURE (NOMINAL MISSION), NO EFFECT. POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (SSME SHUTDOWN WITH UNCONTAINED DAMAGE REQUIRING PROPELLANT SUPPLY ISOLATION) DUE TO INABILITY TO ISOLATE PROPELLANT SUPPLY. CRITICALITY 1/1 FOR ENGINE-OUT ABORTS - POSSIBLE LOSS OF CREW/VEHICLE DUE TO FAILURE TO ISOLATE PROPELLANT SUPPLY FROM FAILED MAIN ENGINE (INITIATING ABORT).

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DISPOSITION AND 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 TESTING

COPPER PATH VERIFICATION, V4LAB0.040A, 050A, 060A 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.