

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2163 -4 REV:06/14/88

ASSEMBLY : D & C PANEL R2 CRIT. FUNC: 1R  
 P/N RI : ME452-0102-7201 CRIT. HDW: 2  
 P/N VENDOR: VEHICLE 102 103 104  
 QUANTITY : 1 EFFECTIVITY: X X X  
 : ONE PHASE(S): PL 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 DEF DEFENSOR REL J Kamura 6/27/88 MPS SSM [Signature]  
 QE DMM D MASAI QE [Signature] EPDC REL [Signature]  
 QE [Signature] MPS REL [Signature]

ITEM:  
 SWITCH, TOGGLE, (TWO POLES, THREE POSITIONS, LEVER LOCKED), PROPELLANT DUMP BACKUP VALVE CONTROL CIRCUIT.

FUNCTION:  
 PROVIDES MANUAL CONTROL OF PROPELLANT DUMP BACKUP LH2 VALVE CONTROL CIRCUIT. 32V73A2S2.

FAILURE MODE:  
 CONTACT-TO-CONTACT SHORT (BOTH "CLOSE" POLES).

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) INADVERTENT MANUAL "CLOSE" COMMAND TO PROPELLANT DUMP BACKUP LH2 VALVE CONTROL CIRCUIT.
- (B) FAILURE PREVENTS DUMPING LH2 THROUGH THE RTLS LINE.
- (C,D) NO EFFECT - FIRST FAILURE.

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SUBSYSTEM : EPDEC - MAIN PROP. FMEA NO 05-6J -2163 -4 REV:06/14/88

- (E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.  
TIME FRAME - POST MECO, PRIOR TO DUMP.  
1) CONTACT-TO-CONTACT SHORT (BOTH "CLOSE" POLES), PREVENTING LH2  
DUMP THROUGH RTLS LINE.  
2) LH2 MANIFOLD RELIEF SYSTEM FAILS TO RELIEVE.

LH2 REMAINING IN MANIFOLD CANNOT BE RELIEVED. RESULTS IN  
OVERPRESSURIZATION AND RUPTURE OF THE FEEDLINE MANIFOLD CAUSING LH2  
LEAKAGE INTO THE AFT COMPARTMENT, OVERPRESSURIZATION AND FIRE/EXPLOSION  
HAZARD. POSSIBLE LOSS OF CRITICAL ADJACENT FUNCTIONS 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

PROP DUMP BACKUP LH2 VLV SW VERIF V41AFO.250A EVERY FLIGHT.

(E) OPERATIONAL USE

LH2 MANIFOLD PRESSURE IS ON CAUTION AND WARNING.

POST MECO/PRE DUMP: START MPS PROPELLANT DUMP AS SOON AS POSSIBLE.

POST DUMP: OPEN THE LH2 FILL/DRAIN VALVES.

05-6J-272