

SHUTTLE CRITICAL ITEMS LIST - ORBITER

1593

SUBSYSTEM : EW&I/MPS

FMEA NO 05-7J -2001 -1 REV:07/16/90
ABORT: RTLS, TAL

LOCATION : MID PCA-1

CRIT.FUNC: 1R

P/N RI QUANTITY

CRIT. HDW: 2

1. NB6GE24-61XXXX 1

VEHICLE	102	103	104	105
EFFECTIVITY	X	X	X	X

PHASE(S): PL LO X OO DO LS

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

PREPARED/APPROVED BY:

REL ENGR T K KIMURA

REL SUPV M L HOVE

DES ENGR J L PECK

DES SUPV G M ANDERSON

QUAL ENGR D J NIELSEN

QUAL SUPV J T COURSEN

APPROVED BY (NASA):

EW&I SSM *William M. Gasta 10/28/90*

EW&I REL *M. Salem Search for Wood 10/23/90*

SSM *[Signature] 10/17/90*

REL *[Signature] 10/18/90*

QE *[Signature] 8/21/90*

ITEM:

CONNECTOR, PLUG, 61 #20 CONTACTS - LH2 RELIEF SHUTOFF VALVE CIRCUIT

FUNCTION:

PROVIDES MATE/DEMATE CAPABILITY FOR WIRING WHICH CONTAINS CIRCUITS FOR ENERGIZING THE LH2 RELIEF SHUTOFF VALVE CLOSE SOLENOID. 40V77W49P805

FAILURE MODE:

PIN-TO-PIN SHORT (HOT)

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 EFFECT:

(A) A PIN-TO-PIN SHORT BETWEEN PINS s AND W WILL APPLY +28V TO THE LH2 RELIEF VALVE CLOSE SOLENOID RESULTING IN THE LOSS OF CAPABILITY TO DE-ENERGIZE THE CIRCUIT.

(B) LOSS OF CAPABILITY TO OPEN LH2 RELIEF SHUTOFF VALVE (PV8). NO EFFECT FOR NOMINAL MISSION. LH2 MANIFOLD PRESSURE WILL NOT RISE TO RELIEF PRESSURE BEFORE DUMP START.

(C,D) NO EFFECT FOR NOMINAL MISSION. POSSIBLE LOSS OF CREW/VEHICLE DURING RTLS/TAL ABORT.

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- (E) LR2, ONE SUCCESS PATH AFTER FIRST FAILURE. TIME FRAME: ASCENT
- 1) PIN TO PIN SHORT BETWEEN PINS E AND W WILL APPLY +28V TO THE LH2 RELIEF VALVE CLOSE SOLENOID RESULTING IN THE LOSS OF CAPABILITY TO DE-ENERGIZE THE CIRCUIT.
 - 2) ONE OF TWO RTLS DUMP VALVES (PV 17, 18) FAILS TO OPEN/REMAIN OPEN FROM MECO +10 TO MECO +90 SECONDS.

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

CRIT 1/1 FOR RTLS/TAL ABORTS. ENOUGH RESIDUALS REMAIN IN THE LH2 MANIFOLD DURING AN RTLS/TAL ABORT TO CAUSE THE LH2 MANIFOLD PRESSURE TO RISE TO RELIEF PRESSURE. FAILURE RESULTS IN LACK OF RELIEF CAPABILITY. POSSIBLE RUPTURE OF THE LH2 MANIFOLD CAUSING LH2 LEAKAGE INTO THE AFT COMPARTMENT, OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF ADJACENT CRITICAL COMPONENTS DUE TO CRYOGENIC EXPOSURE. POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCE CIL 05-6J-2060-2

DISPOSITION & RATIONALE:

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

(A, B, C, D) DISPOSITION AND RATIONALE

REFER TO APPENDIX K, ITEM NO. 1 - TYPE NB CONNECTOR, CIRCULAR, MINIATURE

(B) TEST

GROUND TURNAROUND TEST

- V4LAB0.080 - FVS MDM/SWITCH ELECTRICAL VERIFICATION (EVERY FLIGHT)
- V4LAB0.085 - FVS D AND C BUS REDUNDANCY VERIFICATION (EVERY FIFTH FLIGHT)
- V41BIO.080 - FVS RELIEF SHUTOFF VALVE RESPONSE TIME (EVERY FLIGHT - OR AFTER LRU RETEST)

(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.