

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2260 -1 REV: 11/19/87

ASSEMBLY : AFT LCA-1 CRIT. FUNC: 1R
 P/N RI : MC477-0263-0002 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 2 EFFECTIVITY: X X X
 : TWO PHASE(S): PL X LO OO DO LS
 : 2 PER LH2 INBOARD FILL/DRAIN VALVE

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES WBJ BROWN DES [Signature] EPDC SSM [Signature]
 REL [Signature] DEFENSOR REL [Signature] MPS SSM [Signature]
 QE D MASAI QE - PF [Signature] EPDC REL [Signature]
 MPS REL [Signature] QE [Signature]

ITEM:
 CONTROLLER, HYBRID DRIVER (HDC), TYPE III, LH2 INBOARD FILL/DRAIN VALVE
 OPEN SOLENOID CONTROL POWER.

FUNCTION:
 CONDUCTS MAIN BUS POWER TO OPEN SOLENOID OF LH2 INBOARD FILL/DRAIN
 VALVE. THE TWO HDCs ARE IN SERIES. 54V76A121 J3 (59), (60).

FAILURE MODE:
 LOSS OF OUTPUT, OPENS, INADVERTENTLY OPENS, FAILS TO CONDUCT.

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

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
 (A) LOSS OF POWER TO OPEN SOLENOID.
 (B) FIRST FAILURE - NO EFFECT. BISTABLE FEATURE MAINTAINS FILL/DRAIN
 VALVE IN OPEN POSITION.
 (C,D) FIRST FAILURE - NO EFFECT. POSSIBLE LOSS OF CREW AND VEHICLE
 AFTER SECOND FAILURE (PREMATURE ACTUATION OF CLOSE SOLENOID) RESULTING IN
 PREMATURE CLOSURE OF LH2 INBOARD FILL/DRAIN VALVE. TERMINATION OF
 PROPELLANT LOADING WHICH MAY CAUSE A PRESSURE SPIKE AND POSSIBLE RUPTURE
 OF ORBITER FILL LINE AND/OR GSE INTERFACE/FACILITY LINES. POSSIBLE AFT
 COMPARTMENT OVERPRESSURIZATION AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS
 OF ADJACENT CRITICAL FUNCTIONS DUE TO CRYO EXPOSURE.

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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

COPPER PATH VERIFICATION, V41ABO.121B EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

GROUND - TERMINATE LOADING.

05-6J-420