

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS FMEA NO 05-6KF-2210A -1 REV: 11/03/87

ASSEMBLY : FWD LCA 3 CRIT. FUNC: 1R
 P/N RI : MC477-0262-0002 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 1 EFFECTIVITY: X X X
 : ONE PHASE(S): PL X LO X CO X DC X LS X
 :

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA)
 DES D SOVEREIGN DES D. S. R. Bunn SSM [Signature]
 REL J BEEKMAN REL [Signature] 11-14-87 REL [Signature]
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 EPD/CSS [Signature]

ITEM:
 HYBRID DRIVER CONTROLLER (HDC) TYPE II - FORWARD RCS FUEL AND OXIDIZER
 MANIFOLD 5 ISOLATION VALVE (EVENT INDICATOR "CLOSE" CIRCUIT).

FUNCTION:
 UPON RECEIVING PROPER STIMULI FROM THE ASSOCIATED SET OF FORWARD RCS FUEL
 AND OXIDIZER MANIFOLD 5 ISOLATION VALVE POSITION SWITCHES, THE DRIVER
 CONDUCTS AND ENERGIZES THE CONNECTED EVENT INDICATOR "CLOSE" INPUT AND
 THE "CLOSE" INHIBIT LOGIC CIRCUITRY. 83V76A18AR (J4-53).

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

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

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
 (A) LOSS OF FUNCTION.
 (B) LOSS OF EVENT INDICATOR (TALKEACK) INDICATION AND INHIBIT LOGIC INPUT
 TO THE "CLOSE" SOLENOID COIL CIRCUIT DRIVER. INHIBIT LOSS REDUCES
 REDUNDANCY AGAINST AN INADVERTENT SOLENOID COIL POWERING.
 (C,D) NO EFFECT.
 (E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO
 VALVE OVERHEATING AND PROPELLANT DECOMPOSITION BY CONTINUOUS SOLENOID
 COIL POWERING LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES
 2 OTHER FAILURES (SWITCH SHORT, TYPE IV OPEN/CLOSE DRIVER ON) BEFORE
 EFFECT IS MANIFESTED. THE FAILURE STRING COULD BE UNDETECTABLE AFTER THE
 FIRST FAILURE DUE TO LACK OF MEASUREMENT INDICATIONS FOR THE TYPE III AND
 TYPE IV HYBRID DRIVERS.

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FMEA NO 05-6KF-2210A -1

REV: 11/02/87

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.

(B) GROUND TURNAROUND TEST

COMPONENT CHECKED OUT EVERY FLIGHT DURING GROUND TURNAROUND. THE TESTING CONSISTS OF CYCLING VALVE MANUAL SWITCHES AND/OR SENDING GENERAL PURPOSE COMPUTER (GPC) COMMANDS TO CYCLE VALVES OR HEATERS WHILE MONITORING VEHICLE INSTRUMENTATION TO DETERMINE IF COMPONENTS HAVE FAILED.

(E) OPERATIONAL USE

NO ACTION FOR FIRST FAILURE - NOT DETECTABLE. IF CONTINUOUS POWER SITUATION EXISTS, REMOVE POWER FROM GROUND DRIVER BY PULLING CIRCUIT BREAKER. CIRCUIT BREAKER WILL BE RESET WHEN THE VALVE IS TO BE MOVED.