

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS

FMEA NO 05-6KA-2210A -1

REV:11/03/87

ASSEMBLY :AFT LCA 3
 P/N RI :MC477-0262-0002
 P/N VENDOR:
 QUANTITY :2
 :TWO
 :

CRIT. FUNC: 1R
 CRIT. HDW: 3
 VEHICLE 102 103 104
 EFFECTIVITY: X X X
 PHASE(S): PL X LO X OO X DO X LS X

PREPARED BY:
 DES D SOVEREIGN
 REL J BEEKMAN
 QE

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 APPROVED BY: APPROVED BY (NASA):
 DES *D. A. Buene* SSM
 REL *M. J. Cl. Hore 11-14-87* REL *At 12:45 PM Per 12-7-87*
 QE *W. J. ...* QE *...*

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

FUNCTION:
 UPON RECEIVING PROPER STIMULI FROM THE ASSOCIATED SET OF LEFT AND RIGHT AFT 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.
 56V76A123AR (J8-48,71).

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 (TALKBACK) 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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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.