SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS FMEA NO 05-6KA-2211 -2 REV:11/03/87

ASSEMBLY :AFT LCA 3 CRIT. FUNC: 1R
P/N RI :MC477-0261-0002 CRIT. HDW: 3
P/N VENDOR: VEHICLE 102 103 104
QUANTITY :2 EFFECTIVITY: X X X
:TWO PHASE(S): PL X LO X OO X DO X LS X
:

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

PREPARED BY:
DES D SOVEREIGN
REL J BEEKMAN
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APPROVED BY:
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ITEM:
HYBRID DRIVER CONTROLLER (HDC) TYPE I - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVES ("OPEN" COMMANDS).

FUNCTION:
UPON COMMAND FROM THE ASSOCIATED SOURCE (GENERAL PURPOSE COMPUTER (GPC) OR MANUAL SWITCH), THE SELECTED DRIVER CONDUCTS, SENDING A STIMULUS TO A RELATED REMOTE POWER CONTROLLER TO ENERGIZE THE "OPEN" SOLENOID COILS OF THE LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVES. 56V76A123AR(J8-56,70).

FAILURE MODE:
INADVERTENT OUTPUT, SHORTS, CONDUCTS PREMATURELY.

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

EFFECT(S) ON:
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE

(A) THE ASSOCIATED REMOTE POWER CONTROLLER IS ENABLED TO CONDUCT.

(B) NO EFFECT - OTHER COMPONENTS IN THE SOLENOID CIRCUIT MUST CONDUCT BEFORE THE CIRCUIT IS ENERGIZED AND VALVE FAILS OPEN.

(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 TWO OTHER FAILURES (TYPE III OPEN DRIVER ON, 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.