SHUTTLE CRITICAL ITEMS LIST - ORBITER

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

ASSEMBLY :FWD LCA 3
P/N RI :MC477-0262-0002
P/N VENDOR:
QUANTITY :1
:ONE
:

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL X LO X OO X DO X LS X

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

PREPARED BY:		APPROVED BY:	APPROVED BY (NASA)
DES	D SOVEREIGN	DES	SSM
REL	J BEEKMAN	REL	REL
QE		QE	QE

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

FUNCTION:
UPON RECEIVING PROPER STIMULI FROM THE ASSOCIATED SET OF FORWARD RCS FUE OXIDIZER MANIFOLD 5 ISOLATION VALVE POSITION SWITCHES, THE DRIVER CONDUCTS AND ENERGIZES THE CONNECTED EVENT INDICATOR AND "OPEN" INHIBIT LOGIC CIRCUITRY. 83V76A18AR(J4-54,55).

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 INPU TO THE "OPEN" 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 TWO OTHER FAILURES (SWITCH SHORT, TYPE IV OPEN/CLOSE DRIVER ON) BEFORE EFFECT IS MANIFESTED. THE FAILURE STRING COULD BE UNDETECTABLE AFTER TH FIRST FAILURE DUE TO LACK OF MEASUREMENT INDICATIONS FOR THE TYPE III AN 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.