

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS

FMEA NO 05-6KF-2127 -2

REV: 11/03/87

ASSEMBLY : FWD MCA 1
 P/N RI : MC455-0135-0001
 P/N VENDOR:
 QUANTITY : 4
 : FOUR
 :

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL X	LO X	OO X DO X LS X

CRIT. FUNC: 12
 CRIT. HDW: 3

PREPARED BY:	DES D SOVEREIGN	REL J BEEKMAN	QE	REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
APPROVED BY:	DES <i>D. J. L. K...</i>	REL <i>M. C. ... 11-14-87</i>	QE <i>...</i>	APPROVED BY (NASA):
				SSM
				REL <i>...</i>
				QE <i>...</i>

EPD&C 3346 *...*
 REL - 11-27-87

ITEM:

HYBRID RELAY - FORWARD RCS FUEL AND OXIDIZER TANK ISOLATION VALVES 3/4/5 DRIVER POWER (CLOSE RELAY).

FUNCTION:

UPON RECEIVING THE PROPER STIMULI (FROM EITHER THE GENERAL PURPOSE COMPUTER (GPC) OR THE MANUAL SWITCH) THE HYBRID RELAYS OPERATE TO ENERGIZE THREE PHASE AC DRIVE MOTORS TO CLOSE THE FUEL AND OXIDIZER TANK ISOLATION VALVES 3/4/5. 81V76A111K4, 5, 7, 8.

FAILURE MODE:

INADVERTENT OPERATION, INADVERTENTLY TRANSFERS.

CAUSE(S):

PIECE PART FAILURE, VIBRATION, MECHANICAL SHOCK.

EFFECT(S) ON:

- (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
- (A) AC CONTACTS OF ONE HYBRID RELAY CLOSE.
- (B) "CLOSE" RELAY, NO EFFECT - A SECOND RELAY IS REQUIRED BEFORE VALVE IS ENERGIZED
- (C, D) NO EFFECT.
- (E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO CONTINUOUS DRIVE MOTOR OPERATION IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES TWO OTHER FAILURES (SECOND CLOSE RELAY FAILS ON, BELLOWS LEAK) BEFORE EFFECT IS MANIFESTED. A BELLOWS LEAK IS UNDETECTABLE EXCEPT BY PERFORMING A SNIFF CHECK OF THE VALVE'S ACTUATOR ON THE GROUND. ALSO, POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE INABILITY TO PERFORM EXTERNAL TANK SEPARATION BECAUSE OF FAILED CLOSED VALVE IN CONJUNCTION WITH OTHER TANK ISOLATION VALVE FAILED CLOSED.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS

FMEA NO 05-6KF-2127 -2

REV: 11/03/87

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE A

(A-D) FOR DISPOSITION AND RATIONALE REFER TO APPENDIX C, ITEM NO. 1 - HYBRID RELAY.

(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. IF CONTINUOUS POWER SITUATION EXISTS, REMOVE POWER TO RELAY BY PULLING APPROPRIATE CIRCUIT BREAKERS. CIRCUIT BREAKERS WILL BE RESET WHEN VALVES ARE TO BE MOVED AND DURING TIME CRITICAL RECONFIGURATION RESPONSE PERIODS.