SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - FWD-RCS　　FMEA NO 05-6KF-2126A -2　　REV:11/03/87

ASSEMBLY :FWD MCA 3　　CRIT. FUNC: 1R
P/N RI :MC455-0135-0001　　CRIT. HDW: 3
P/N VENDOR:

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X

QUANTITY :4
:FOUR
:

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	R BURNS	DES	D.S. R Burns	SSM	
REL	J BEEKMAN	REL	11-14-87	REL	
QE		QE		QE	
				EPD&C SSM	

ITEM:
HYBRID RELAY - FORWARD RCS FUEL AND OXIDIZER TANK ISOLATION VALVE 1/2 DRIVER POWER (CLOSE RELAY).

FUNCTION:
UPON RECEIVING THE PROPER STIMULI (FROM THE GENERAL PURPOSE COMPUTER OR MANUAL SWITCHES), THE HYBRID RELAYS OPERATE TO ENERGIZE THREE PHASE AC DRIVE MOTORS TO CLOSE THE FUEL AND OXIDIZER TANK ISOLATION VALVES 1/2. 83V76A113K2,3,5,6.

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) NO EFFECT - "CLOSE" CIRCUITRY FOR VALVE DRIVES REQUIRE CLOSURE OF TWO SETS OF RELAY CONTACTS IN SERIES BEFORE THE DRIVE IS ENERGIZED.

(C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO VALVE CONTINUOUS POWER IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES 2 OTHER FAILURE (SECOND "CLOSE" RELAY OPERATES, 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.

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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 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.