

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS

FMEA NO 05-GKF-2255F -1

REV: 11/03/87

ASSEMBLY : FWD MCA 1,2,3

P/N RI : JANXVIN4246

P/N VENDOR:

QUANTITY : 4

: FOUR

:

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL X	LO X	CO X
		DC X	LS X

CRIT. FUNC: 1R

CRIT. HDW: 3

PREPARED BY:

DES

D SOVEREIGN

REL

J BEEKMAN

QE

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

APPROVED BY:

DES

REL

QE

APPROVED BY (NASA):

SSM

REL

QE

ITEM:

BLOCKING DIODE - FORWARD RCS FUEL AND OXIDIZER MANIFOLDS 1, 2, 3, AND 4 ISOLATION VALVE CONTROL CIRCUIT (MANUAL CLOSE/OPEN INHIBIT).

FUNCTION:

PROVIDES BLOCKING BETWEEN DUAL STIMULI (FROM MANUAL SWITCH "CLOSE" CIRCUIT AND "OPEN" LIMIT SWITCHES) TO HYBRID RELAY INHIBIT LOGIC INPUTS FOR THE CONTROL OF 3 PHASE AC VOLTAGE TO THE FUEL AND OXIDIZER MANIFOLDS 1, 2, 3, AND 4 ISOLATION VALVE CONTROL CIRCUITS.

81V76A111A1CR13. 82V76A112A1CR1. 83V76A113A1CR7,16.

FAILURE MODE:

OPEN, FAILS TO CONDUCT, HIGH RESISTANCE

CAUSE(S):

THERMAL STRESS, MECHANICAL SHOCK, VIBRATION

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) LOSS OR DEGRADATION OF ABILITY TO ENERGIZE THE AFFECTED VALVE DRIVE "OPEN" INHIBIT LOGIC CIRCUITRY WHEN THE MANUAL SWITCH IS IN THE "CLOSE" POSITION.

(B) NO EFFECT SINCE NO "OPEN" COMMAND IS PRESENT.

(C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - VALVE WILL CHATTER OFF THE CLOSE STOP. POSSIBLE LOSS OF CREW/VEHICLE DUE TO CONTINUOUS MOTOR OPERATION IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES TWO OTHER FAILURES (MANUAL OPEN/CLOSE INHIBIT DIODE SHORTS, 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 F, ITEM NO. 3 - DIODE.

(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 RELAY BY PLACING MANUAL SWITCH IN GPC (GENERAL PURPOSE COMPUTER) POSITION.