

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS

FMEA NO 05-6KF-2255F -2

REV: 11/03/87

ASSEMBLY : FWD MCA 1, 2, 3
 P/N RI : JANTXVIN4246
 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: 15
 CRIT. HDW: 3

PREPARED BY:
 DES D SOVEREIGN
 REL J BEEKMAN
 QE

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 APPROVED BY:
 DES D.S. Quinn APPROVED BY (NASA):
 REL M. J. ... SSM
 QE ... REL ...
 FDDIC SSM

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:

SHORT, INTERNAL SHORT, LOW BACK RESISTANCE

CAUSE(S):

CONTAMINATION, THERMAL STRESS

EFFECT(S) ON:

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

(A) LOSS OF STIMULI ISOLATION CAPABILITY.

(B) VALVE "OPEN" LIMIT SWITCH OUTPUT IS NOT ISOLATED FROM THE MANUAL SWITCH "CLOSE" COMMAND CIRCUIT. NO EFFECT - THE "CLOSE" RELAY IS INHIBITED WHEN THE MANUAL SWITCH IS IN THE "OPEN" POSITION.

(C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO CONTINUOUS MOTOR OPERATION IN CONJUNCTION WITH A BELLOWS LEAK WHICH COULD LEAD TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES 2 OTHER FAILURES (MANUAL OPEN/CLOSE INHIBIT DIODE OPENS, 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.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - FWD-RCS

FMEA NO 05-6KF-2255F -2

REV:11/03/87

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.