

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS FMEA NO 05-6KF-2255 -1 REV: 11/03/87

ASSEMBLY : FWD MCA 1,2,3 CRIT. FUNC: 1R
 P/N RI : JANTXVIN4246 CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 8 EFFECTIVITY: X X X
 : EIGHT PHASE(S): PL X LG X CG X DG X LS X
 :

PREPARED BY: DES D SOVEREIGN APPROVED BY: REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 REL J BEEKMAN DES *T. S. R. Burns* APPROVED BY (NASA) SSM
 QE *M. J. ...* REL *...* QE *...*

ITEM:

BLOCKING DIODE - FORWARD RCS FUEL AND OXIDIZER MANIFOLDS 1, 2, 3, AND 4 ISOLATION VALVE CONTROL CIRCUIT (LIMIT SWITCH).

FUNCTION:

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

81V76A111A1CR6,12. 81V76A112A1CR2,5. 83V76A113A1CR8,15,29,38.

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) THE ASSOCIATED VALVE DRIVE CIRCUIT IS ENERGIZED CONTINUOUSLY WHEN THE MANUAL SWITCH IS IN THE "OPEN" OR "CLOSE" POSITION.

(B) CONTINUOUS POWER WILL BE APPLIED TO THE AFFECTED MANIFOLD ISOLATION VALVE DRIVE MOTOR.

(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 1 OTHER FAILURE (BELLOWS LEAK) BEFORE THE 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

REMOVE POWER FROM RELAY BY PLACING MANUAL VALVE IN GPC (GENERAL PURPOSE COMPUTER) POSITION.