

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS FMEA NO 05-6KF-2255E -2 REV:11/03/87

ASSEMBLY : FWD MCA 1,2,3				CRIT. FUNC: 1R
P/N RI : JANTXV1N4246				CRIT. HDW: 3
P/N VENDOR:		VEHICLE	102 103 104	
QUANTITY : 4		EFFECTIVITY:	X X X	
: FOUR		PHASE(S):	PL X LO X OO X DO X LS X	
:				

PREPARED BY:		REDUNDANCY SCREEN:	A-PASS B-FAIL C-PASS
DES D SOVEREIGN	APPROVED BY:		APPROVED BY (NASA):
REL J BEEKMAN	<i>D. J. Quinn</i>	DES	SSM
QE	<i>M. J. Quinn 11-14-87</i>	REL	<i>RELAY</i>
	<i>11/17/87</i>	QE	<i>QE</i>

EDD&C SSM

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

FUNCTION:
PROVIDES BLOCKING BETWEEN DUAL STIMULI (FROM MANUAL SWITCH "OPEN" CIRCUIT AND "CLOSE" LIMIT SWITCHES) TO HYBRID RELAY 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.
82V76A111A1CR5. 82V76A112A2CR6. 83V76A113A1CR34,35.

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 OR DEGRADATION OF STIMULI ISOLATION CAPABILITY.

(B) LOSS OF ISOLATION BETWEEN THE VALVE "CLOSE" LIMIT SWITCH CIRCUIT AND MANUAL SWITCH "OPEN" COMMAND CIRCUIT - NO EFFECT, SINCE "OPEN" RELAYS ARE INHIBITED WHEN THE MANUAL SWITCH IS IN THE "CLOSE" POSITION. ALSO, SWITCH IS NORMALLY IN THE "OPEN" POSITION THROUGHOUT FLIGHT - TRANSFER TO "CLOSE" WOULD OCCUR WHEN ISOLATION IS REQUIRED.

(C,D) NO EFFECT.

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(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 CLOSE/OPEN 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.

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.