

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS

FMEA NO 05-6KF-2253 -1

REV: 11/03/87

ASSEMBLY : FWD MCA 3  
 P/N RI : JANTXVLN4246  
 P/N VENDOR:  
 QUANTITY : 4  
 : FOUR  
 :

	VEHICLE	102	103	104
CRIT. FUNC:				2R
CRIT. HDW:				2
EFFECTIVITY:	X	X	X	
PHASE(S):	PL X LO X	OO X DO X	LS X	

PREPARED BY:  
 DES D SOVEREIGN  
 REL J BEEKMAN  
 QE

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS  
 APPROVED BY: APPROVED BY (NASA):  
 DES D.S. Ruben SSM [Signature]  
 REL [Signature] REL [Signature]  
 QE [Signature] QE [Signature]

ITEM:

BLOCKING DIODE - FORWARD RCS FUEL AND OXIDIZER TANK ISOLATION VALVES 1/2 CONTROL CIRCUITS (LIMIT SWITCH).

FUNCTION:

PROVIDES BLOCKING BETWEEN DUAL STIMULI (FROM VALVE LIMIT SWITCHES AND MANUAL SWITCHES) TO HYBRID RELAY INHIBIT LOGIC INPUTS FOR THE CONTROL OF 3 PHASE AC VOLTAGE TO THE FUEL AND OXIDIZER TANK ISOLATION VALVE 1/2 DRIVE MOTORS.

83V76A113A1CR4, 6, 31, 32.

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 IN THE SELECTED (OPEN OR CLOSE) MANUAL SWITCH POSITION.

(B) "OPEN" SIDE - CONTINUOUS POWER WILL BE APPLIED TO THE AFFECTED ISOLATION VALVE COIL. "CLOSE" SIDE - NO EFFECT, REQUIRES SECOND RELAY TO BE ENERGIZED BEFORE CONTINUOUS POWER IS APPLIED TO VALVE COIL.

(C) NO EFFECT.

(D) NO EFFECT FIRST FAILURE - NEXT FAILURE COULD RESULT IN HAZARDOUS CONDITION.

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(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO CONTINUOUS MOTOR OPERATION IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES 1 OTHER FAILURE (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

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