

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2261E -1

REV: 11/03/87

ASSEMBLY : AFT MCA 1,3  
 P/N RI : JANTXV1N4246  
 P/N VENDOR:  
 QUANTITY : 16  
 : SIXTEEN  
 :

	VEHICLE	102	103	104
CRIT. FUNC:				1R
CRIT. HDW:				3
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. J. A. Burns SSM [Signature]  
 REL [Signature] 11-14-87 REL [Signature]  
 QE [Signature] QE [Signature]  
 EPD&C

ITEM:

BLOCKING DIODE - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER CROSSFEED - ISOLATION VALVES 1/2 AND 3/4/5 (MANUAL OPEN/CLOSE INHIBIT).

FUNCTION:

PROVIDES BLOCKING BETWEEN DUAL STIMULI (FROM MANUAL SWITCH OPEN CIRCUIT AND CLOSE LIMIT SWITCHES) TO HYBRID RELAY INHIBIT LOGIC INPUTS FOR THE CONTROL OF 3 PHASE AC VOLTAGE TO THE FUEL AND OXIDIZER CROSSFEED VALVES 1/2 AND 3/4/5 DRIVE MOTORS.

OV-102 - 54V76A114A1CR16,29,87,88. 54V76A114A5CR13,14,24,25.  
 56V76A116A1CR56,61,77,78,81,90. 56V76A116A2CR55,61.  
 OV-103 & SUBS - 54V76A114A4CR2,15,17,21. 54V76A114A1CR23,34,100,101.  
 56V76A116A1CR62,67,89,90,93,104. 56V76A116A3CR16,28.

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 DRIVES, INHIBIT LOGIC CIRCUITRY.

(B) THE AFFECTED LOGIC INPUT CANNOT INHIBIT THE VALVE DRIVE "CLOSE" CIRCUITRY - NO EFFECT.

(C,D) NO EFFECT.

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(E) FUNCTION CRITICALITY EFFECT - VALVE WILL CHATTER OFF THE OPEN 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 THREE OTHER FAILURES ("OPEN INHIBIT" DIODE SHORT, SECOND "CLOSE" RELAY FAIL ON, 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 POSITION.