

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS . FMEA NO 05-6KA-2253E -2 REV: 11/03/87

ASSEMBLY : AFT MCA 3	ABORT,	CRIT. FUNC:	1R
P/N RI : JANTXV1N4246	RTLS, TAL	CRIT. HDW:	3
P/N VENDOR:	VEHICLE	102	103 104
QUANTITY : 8	EFFECTIVITY:	X	X X
: EIGHT	PHASE(S):	PL X LO X OO X DO X LS X	
:			

PREPARED BY:	D SOVEREIGN	APPROVED BY:	REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
DES	J BEEKMAN	DES	APPROVED BY (NASA):
REL		REL	SSM
QE		QE	REL

[Handwritten signatures and dates: 11-14-87, 11/17/87, etc.]

ITEM: BLOCKING DIODE (1 AMP) - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER TANK ISOLATION VALVES 1/2 CONTROL CIRCUITS (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 TANK ISOLATION VALVE 1/2 DRIVE MCTORS.

OV-102 - 56V76A116A1CR19, 20, 87, 88, 91, 92. 56V76A116A2CR63, 64.
 OV-103 & SUBS - 56V76A116A1CR60, 61, 101, 102, 105, 106. 56V76A116A2CR52, A3CR50.

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 "CLOSE" LIMIT SWITCH OUTPUT IS NOT ISOLATED FROM THE MANUAL SWITCH "OPEN" COMMAND CIRCUIT.

(C) NO EFFECT

(D) NO EFFECT FOR NOMINAL MISSION - CRITICALITY INCREASED TO 1/1 DURING RTLS AND TAL ABORT. GENERAL PURPOSE COMPUTER (GPC) COMMAND UTILIZED BY MCA OPTIMIZATION SOFTWARE IN "LANDING HEAVY" CONDITION. WILL ALSO RESULT IN CONTROL PROBLEMS DURING ENTRY. RESULTS IN LOSS OF 12 AFT RCS THRUSTERS BEING USED DURING THE OMS DUMP.

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(E) FUNCTION CRITICALITY EFFECT - VALVE WILL CHATTER OFF THE CLOSE STOP. POSSIBLE LOSS OF CREW/VEHICLE DUE TO VALVE CONTINUOUS POWER IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES 2 OTHER FAILURES (DIODE OPEN, 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 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.