

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2254E -1

REV: 11/03/87

ASSEMBLY : AFT MCA 1,2
P/N RI : JANTXVIN4246
P/N VENDOR:
QUANTITY : 4
: FOUR
:

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL X	LO X	OO X DO X LS X

CRIT. FUNC: 1R
CRIT. HDW: 3

PREPARED BY:
DES D SOVEREIGN
REL J BEEKMAN
QE

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
APPROVED BY:
DES D.S. R. B...
REL ...
QE ...

APPROVED BY (NASA):
SSM
REL ...
QE ...
EPD&C SSM
...
...

ITEM:

BLOCKING DIODE (1 AMP) - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER TANK ISOLATION VALVES 3/4/5 A AND B 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 VALVES 3/4/5 A AND B DRIVE MOTORS.

OV-102 - 54V76A114A2CR41,74. 55V76A115A1CR16,47.
OV-103 & SUBS - 54V76A114A2CR16,44. 55V76A115A2CR31. 55V75A115A1CR49.

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 INHIBIT THE AFFECTED VALVE DRIVE CLOSE RELAY.

(B) THE AFFECTED LOGIC INPUT CANNOT INHIBIT THE VALVE DRIVE "CLOSE" - CIRCUITRY - NO EFFECT. NO "CLOSE" COMMAND IS PRESENT TO INITIATE FURTHER MOTOR OPERATION.

(C,D) NO EFFECT.

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

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.