

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2255E -1

REV: 11/03/87

ASSEMBLY : AFT MCA 1,2,3

CRIT. FUNC: 1R

P/N RI : JANTXV1N4246

CRIT. HDW: 3

P/N VENDOR:

VEHICLE 102 103 104

QUANTITY : 8

EFFECTIVITY: X X X

: EIGHT

PHASE(S): FL X LO X OO X DO X LS X

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY:

APPROVED BY:

APPROVED BY (NASA):

DES D SOVEREIGN

DES *D.S. [Signature]*

SSM

REL J BEEKMAN

REL *[Signature] 11-14-87*

REL *[Signature] 11-14-87*

QE

QE *[Signature]*

QE *[Signature]*

EPD&C [Signature]
7-22-11-11-87

ITEM:

BLOCKING DICDE - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER MANIFOLDS
1,2,3,4 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 INHIBIT LOGIC INPUTS FOR THE CONTROL OF 3 PHASE AC VOLTAGE TO THE FUEL AND OXIDIZER MANIFOLDS 1,2,3,4 ISOLATION VALVE CONTROL CIRCUITS.

OV-102 - 54V76A114A2CR13,17. 55V76A115A2CR40,66.

56V76A116A1CR107,109,111. 56V76A116A5CR27.

OV-103 & SUBS - 54V76A114A1CR2,3. 55V76A115A1CR2,A2CR10.

56V76A116A1CR1,3,107,120.

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 CIRCUIT.

(B) THE AFFECTED LOGIC INPUT CANNOT INHIBIT THE VALVE DRIVE "CLOSE" CIRCUITRY.

(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 OPERATIONS IN CONJUNCTION WITH A BELLOWS LEAK AND LEADING TO VALVE RUPTURE AND PROPPELLANT RELEASE. REQUIRES TWO OTHER FAILURES (MANUAL CLOSE/OPEN INHIBIT DIODE SHORT, 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.