SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS FMEA NO 05-6KA-2261E -2 REV:11/03/87

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

CRIT. FUNC: 1R
CRIT. HDW: 3

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

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

PREPARED BY:
DES D SOVEREIGN
REL J BEEKMAN
QE

APPROVED BY:
DES
REL
QE

APPROVED BY (NASA):
SSM
REL
QE

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:
SHORT, INTERNAL SHORT, LOW BACK 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 STIMULI ISOLATION CAPABILITY.

(B) LOSS OF ISOLATION BETWEEN VALVE "CLOSE" LIMIT SWITCH CIRCUIT AND MANUAL SWITCH "OPEN" COMMAND CIRCUIT.

(C,D) NO EFFECT.

(E) FUNCTION CRITICALITY EFFECT - VALVE WILL CHATTER OFF THE CLOSE 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 TWO OTHER FAILURES ("OPEN INHIBIT" 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.

ISPOSITION & 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.