

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS FMEA NO 05-6KA-2261 -1 REV:11/03/87

ASSEMBLY : AFT MCA 1,3 CRIT. FUNC: 1R
P/N RI : JANTXVIN4246 CRIT. HEW: 2
P/N VENDOR: VEHICLE 102 103 104
QUANTITY : 32 EFFECTIVITY: X X X
:THIRTY-TWO PHASE(S): PL 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. J. R. B... SSM [Signature]
REL J BEEKMAN REL [Signature]
QE QE [Signature] EPP&C SSM [Signature]

ITEM:
BLOCKING DIODE - LEFT AND RIGHT AFT RCS FUEL CROSSFEED ISOLATION VALVE
1/2 AND 3/4/5 RELAY CONTROL CIRCUITS (LIMIT SWITCHES).

FUNCTION:
PROVIDES BLOCKING BETWEEN DUAL LOGIC INPUTS FROM VALVE LIMIT SWITCHES AND
MANUAL SWITCHES TO RELAYS SWITCHING THE AFT RCS LEFT AND RIGHT FUEL AND
OXIDIZER CROSSFEED ISOLATION VALVE 1/2 AND 3/4/5 CIRCUITS.

OV-102 - 54V76A114A1CR2,4,40,41,45,46,101,102.
54V76A114A5CR8,9,15,16,20,21,23,27. 56V76A116A1CR1,2,3,4,43,44,
47,48,53,63,64,67,75,104. 56V76A116A2CR51,75.
OV-103 & SUBS - 54V76A114A4CR6,8,11,12,24,25,26,27.
54V76A114A1CR6,8,46,47,50,51,115,116.
56V76A116A1CR1,6,7,8,48,49,52,53,56,74,80,81,84,116. 56V76A116A3CR7,41.

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) THE ASSOCIATED VALVE DRIVE CIRCUIT IS ENERGIZED CONTINUOUSLY IN THE
SELECTED (OPEN OR CLOSE) MANUAL SWITCH POSITION.

(B) "OPEN" SIDE - CONTINUOUS POWER WILL BE APPLIED TO THE AFFECTED
ISOLATION VALVE COIL. "CLOSE" SIDE - NO EFFECT, REQUIRES SECOND RELAY TO
BE ENERGIZED BEFORE CONTINUOUS POWER IS APPLIED TO VALVE COIL.

(C,D) NO EFFECT.

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(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO VALVE CONTINUOUS POWER IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES 1 OTHER FAILURE (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

REMOVE POWER FROM RELAY BY PLACING MANUAL SWITCH IN GPC POSITION.