

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS FMEA NO 05-6L -2003 -1 REV: 03/14/88
ASSEMBLY : AFT MCA 1,2,3 CRIT. FUNC: 1R
P/N RI : RWR80S1211FR (OV-102 AND SUBSEQUENT) CRIT. HDW: 2
RLR42C12016M (OV-102 ONLY)
F/N VENDOR: VEHICLE 102 103 104
QUANTITY : 8 EFFECTIVITY: X X X
: EIGHT PHASE(S): PL X LO X CO X DO X LS X
: (ONE PER VALVE)

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
PREPARED BY: APPROVED BY: APPROVED BY (NASA):
DES D SOVEREIGN DES P. J. R. Burns SSM John Johnson 4/10/88
REL F DEFENSOR REL John Johnson 4/10/88
QE J COURSEN QE John Johnson 4/10/88
ETCC SSM of Camp J. U.S. 4/10/88
ETCC REL of J. Woodland 4/10/88

ITEM:
RESISTOR, CURRENT LIMIT, 1.21K OHM, 2 W, LEFT AND RIGHT OMS FUEL/OXIDIZE
CROSSFEED ISOLATION VALVE A AND B LOGIC AND POSITION INDICATION CIRCUIT.

FUNCTION:
PROVIDES CURRENT LIMITING/CIRCUIT PROTECTION FOR LOGIC AND POSITIVE
INDICATION CIRCUITS OF THE LEFT AND RIGHT OMS FUEL AND OXIDIZER CROSS
FEED ISOLATION A AND B VALVES. FOR OV-102: 54V76A114A4R5, 6
55V76A115A4R4, 5, 7, 8, 56V76A116A3R12, A4R12. FOR OV-103 AND
SUBSEQUENT: 54V76A114A3R9, 11, 55V76A115A3R10, 20, 24, 26
56V76A116A4R23, 24.

FAILURE MODE:
FAILS OPEN.
(COCKPIT SWITCH IN THE "OPEN/CLOSE" POSITION).

CAUSE(S):
STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, THERMAL STRESS.

EFFECT(S) ON:
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL
CRITICALITY

(A) LOSS OF POWER TO THE AFFECTED POSITION INDICATION AND RELAY LOGIC
INHIBIT COMMAND CIRCUITS.

(B) LOSS OF CROSSFEED ISOLATION VALVE POSITION INDICATION AND RELAY
LOGIC INHIBIT COMMAND. THE "OPEN/CLOSE" MOTOR VALVE DRIVE CIRCUIT IS
CONTINUOUSLY ENERGIZED. POSITION INDICATION "TALKBACK" WILL SHOW "NULL
OR BARBER POLES" INDICATION. THERMAL SWITCHES IN VALVE WILL INTERRUPT
POWER ON A CYCLIC BASIS.

(C,D) FIRST FAILURE HAS NO EFFECT.

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SUBSYSTEM :EPD&C - OMS

FMEA NO 05-6L -2083 -1 REV:03/14/83

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE LOSS OF ELECTRICAL POWER NECESSARY FOR COMPLETION OF FUNCTION. REQUIRES ONE OTHER FAILURE (BELLOWS LEAK) BEFORE THE EFFECT IS MANIFESTED. CONTINUOUS POWER APPLIED TO THE AC MOTOR VALVE MAY RESULT TO VALVE OVERHEATING AND PROPELLANT DECOMPOSITION LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. BELLOWS LEAK FAILURE NOT DETECTABLE IN FLIGHT. RESISTOR FAILED OPEN IN FLIGHT IS DETECTABLE THROUGH THE POSITION INDICATION TALKBACK.

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE

REFER TO APPENDIX E, ITEMS NO. 1 - RESISTOR, FILM AND NO. 3 - RESISTOR, WIRE WOUND.

(B) GROUND TURNAROUND TEST

V43CAO.070 - REDUNDANT CIRCUIT VERIFICATION (PERIODIC) - ORB/POS PERFORMED FOR FIRST FLIGHT AND AT FIVE FLIGHT INTERVALS OR FOR LRU RETEST PER FIGURE V43Z00.000 OR FOR ORBITER DISCONNECTED COPPER PATHS. FUNCTIONAL CHECKOUT OF AC MOTOR VALVE CONTROL CIRCUITS PER FIGURE V43CAO.070-2.

V43CAO.072 - REDUNDANT CIRCUIT VERIFICATION; PERFORMED EACH FLIGHT (AFTER FIRST FLIGHT). FUNCTIONAL CHECKOUT OF AC MOTOR CONTROL CIRCUITS PER FIGURE V43CAO.070-2.

V43CBO.165 - AC MOTOR VALVE ACTUATOR SNIFF CHECK; PERFORMED EACH FLIGHT ALL AC MOTOR VALVE ACTUATORS CHECKED FOR PRESENCE OF PROPELLANT VAPORS.

V43CFO.010 - PROPELLANT SERVICING TO FLIGHT LOAD; PERFORMED EACH FLIGHT ALL AC MOTOR VALVES CYCLED DURING LOADING OPERATION.

(E) OPERATIONAL USE

PLACE SWITCH IN GENERAL PURPOSE COMPUTER (GPC) POSITION TO REMOVE CONTINUOUS POWER FROM VALVE RELAY.