

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS FMEA NO 05-6L -2079A -2 REV:10/30/87

ASSEMBLY : APT MCA 1,3  
P/N RI : RWR80S1211FR (OV-102 AND SUBSEQUENT) CRIT. FUNC: 1R  
: RLR42C12016M (OV-102 ONLY) CRIT. HDW: 2  
P/N VENDOR:  
QUANTITY : 4 VEHICLE 102 103 104  
EFFECTIVITY: X X X  
: FOUR PHASE(S): PL X LO X OO X DO X LS X  
: (ONE PER VALVE PAIR)

PREPARED BY: REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS  
DES D SOVEREIGN APPROVED BY: APPROVED BY (NASA):  
REL F DEFENSOR DES D. J. R. Brown SSM John W. ...  
QE J COURSEN REL E. J. ... 11-12-87 REL ... 12-4-87  
QE ... 4/7/87 QE ...  
EPSC 51.0 C/A Tampa For W.C. Stang

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

FUNCTION:  
PROVIDES CURRENT LIMITING/CIRCUIT PROTECTION FOR RELAY LOGIC CIRCUITS OF THE LEFT AND RIGHT OMS FUEL AND OXIDIZER TANK ISOLATION A AND B VALVES. FOR OV-102 - 54V76A114A3R1, A4R11. 56V76A116A3R3, A4R3. FOR OV-103 AND SUBSEQUENT - 54V76A114A3R2, 21. 56V76A116A4RS, 6.

FAILURE MODE:  
FAILS OPEN.

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 INDICATION AND RELAY LOGIC INHIBIT COMMAND CIRCUITS.  
(B) LOSS OF TANK ISOLATION VALVE TELEMETRY POSITION INDICATION TO MDM AND RELAY LOGIC INHIBIT COMMAND. THE "OPEN/CLOSE" MOTOR VALVE DRIVE CIRCUIT IS CONTINUOUSLY ENERGIZED. FIRST FAILURE HAS NO EFFECT. THERMAL SWITCHES IN VALVE WILL INTERRUPT POWER ON A CYCLIC BASIS.  
(C,D) FIRST FAILURE HAS NO EFFECT.

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(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 IN VALVE OVERHEATING AND PROPELLANT DECOMPOSITION LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. FAILURE NOT DETECTABLE IN FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS. BELLOWS FAILURE NOT DETECTABLE IN FLIGHT.

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/POD; PERFORMED FOR FIRST FLIGHT AND AT FIVE FLIGHT INTERVALS OR FOR LRU RETEST PER FIGURE V43200.000 OR FOR ORBITER DISRUPTED COPPER PATHS. FUNCTIONAL CHECKOUT OF AC MOTOR VALVE CONTROL CIRCUITS PER FIGURE V43CAO.070-2.

V43CAO.072 - REDUNDANT CIRCUIT VERIFICATION; VAF2-90. FUNCTIONAL CHECKOUT OF AC MOTOR VALVE CONTROL CIRCUITS PER FIGURE V43CAO.070-2.

V43CBO.165 - AC MOTOR VALVE ACTUATOR SNIFF CHECK; VAF1-90;C. SNIFF CHECK OF VALVE ACTUATOR CAVITY FOR PRESENCE OF PROPELLANT VAPORS.

(E) OPERATIONAL USE

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