

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS FMEA NO 05-6L -2260 -1 REV: 10/30/87

ASSEMBLY : AFT MCA 1,2,3
P/N RI : JANTXVIN4246
P/N VENDOR:
QUANTITY : 16
: SIXTEEN
: (TWO PER VALVE)

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

CRIT. FUNC: 1R
CRIT. HDW: 2

PREPARED BY:
DES D SOVEREIGN
REL F DEFENSOR
QE J COURSEN

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
APPROVED BY: APPROVED BY (NASA):
DES P.S. R. Burns SSM John Thomas
REL D. M. S. G. 11-14-87 REL 12-4-87
QE DM/STL QE 12-4-87
EPD&C SSM QBC/epc for LSC Staff

ITEM:

DIODE, BLOCKING (LAMP), OMS LEFT AND RIGHT, FUEL AND OXIDIZER CROSSFEED ISOLATION VALVE A AND B RELAY "OPEN" INHIBIT CONTROL CIRCUITS. ("OPEN" LIMIT SWITCH INHIBIT DIODE).

FUNCTION:

PROVIDES INHIBIT INPUT FROM THE "OPEN" LIMIT SWITCH TO THE "OPEN" HYBRID RELAY AND PROVIDES BLOCKING FROM THE "CLOSE" MANUAL SWITCH TO THE "OPEN" LIMIT SWITCH FOR THE CONTROL OF THREE PHASE AC MOTOR THAT ACTUATES THE OMS. LEFT AND RIGHT FUEL AND OXIDIZER CROSSFEED ISOLATION VALVE A AND B. FOR OV-102 - VALVE A; RIGHT - 56V76A116A2CR4, 40, 45, 46. LEFT- 54V76A114A1CR43, 44, 53, 75. VALVE B; RIGHT - 55V76A115A2CR3, 4, 7, 8. LEFT - 55V76A115A1CR43, 44, A2CR9, 10. FOR OV-103 AND SUBSEQUENT - VALVE A; RIGHT - 56V76A116A2CR10, 11, 64, 67. LEFT - 54V76A114A1CR43, 49, 56, 74. VALVE B; RIGHT - 55V76A115A1CR4, 18, 19, 36. LEFT- 55V76A115A1CR20, 21, 109, 110.

FAILURE MODE:

OPENS, FAILS TO CONDUCT, HIGH RESISTANCE. (COCKPIT SWITCH IN THE "OPEN" POSITION.)

CAUSE(S):

CONTAMINATION, THERMAL STRESS, MECHANICAL SHOCK, VIBRATION.

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) LOSS OF INHIBIT SIGNAL TO THE "OPEN" HYBRID DRIVER RELAY CAUSING THE ASSOCIATED AC MOTOR VALVE DRIVE "OPEN" CIRCUIT TO BE CONTINUOUSLY ENERGIZED.

(B) CONTINUOUS POWER IS APPLIED TO THE ASSOCIATED AC DRIVE MOTOR. THERMAL SWITCH IN VALVE INTERRUPTS POWER ON A CYCLIC BASIS.

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(C,D) FIRST FAILURE HAS NO EFFECT.

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO CONTINUOUS POWER APPLIED TO THE AC MOTOR VALVE IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO A POSSIBLE DETONATION CONDITION RESULTING IN VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES ONE OTHER FAILURE (BELLOWS LEAK) BEFORE THE EFFECT IS MANIFESTED. FAILURE IS 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, ITEM NO. 3 - DIODE.

(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 V43Z00.000 OR FOR ORBITER DISRUPTED COPPER PATHS.
FUNCTIONAL CHECKOUT OF AC MOTOR VALVE CONTROL CIRCUITS PER FIGURE
V43CAO.070-2.

V43CAO.072 - REDUNDANT CIRCUIT VERIFICATION; PERFORMED EACH FLIGHT
(AFTER FIRST FLIGHT). FUNCTIONAL CHECKOUT OF AC MOTOR VALVE 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.

(E) OPERATIONAL USE

REMOVE POWER FROM RELAY BY PLACING MANUAL SWITCH IN GENERAL PURPOSE
COMPUTER (GPC) POSITION.