

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS

FMEA NO 05-6L -2256B -2

REV: 10/30/87

ASSEMBLY : APT MCA 1,3
 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: 3

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

REDUNDANCY SCREEN:
 APPROVED BY:
 DES *D. J. R. Berman*
 REL *D. J. R. Berman*
 QE *D. J. R. Berman*

APPROVED BY (NASA):
 SSM *John Thomas for JH*
 REL *John Thomas for JH*
 QE *John Thomas for JH*
EPDC SSM Approval for use stage

ITEM:

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

FUNCTION:

PROVIDES INHIBIT INPUT FROM THE "OPEN" MANUAL SWITCH TO THE "CLOSE" HYBRID RELAY AND PROVIDES BLOCKING FROM THE "CLOSE" LIMIT SWITCH TO THE "OPEN" MANUAL SWITCH FOR THE CONTROL OF THREE PHASE AC MOTOR THAT ACTIVATES THE OMS LEFT AND RIGHT FUEL AND OXIDIZER TANK ISOLATION VALVE A AND B. FOR OV-102: VALVE A; RIGHT - 54V76A114A1CR89, 90, 101, 108. LEFT - 54V76A114A1CR57, 58, 91, 92. VALVE B; RIGHT - 56V76A116A2CR53, 57, 87, 88. LEFT - 56V76A116A2CR19, 20, 83, 90. FOR OV-103 AND SUBS: VALVE A; RIGHT - 54V76A114A1CR96, 97, 102, 103. LEFT - 54V76A114A1CR69, 70, 104, 105. VALVE B; RIGHT - 56V76A116A2CR31, 32, A3CR30, 43. LEFT - 56V76A116A3CRB, 9, 57, 60.

FAILURE MODE:

SHORTS, INTERNAL SHORT, LOW BACK RESISTANCE.
 (COCKPIT SWITCH IN THE "OPEN" POSITION.)

CAUSE(S):

CONTAMINATION, THERMAL STRESS, MECHANICAL SHOCK, VIBRATION.

EFFECT(S) ON:

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

(A) LOSS OF ISOLATION BETWEEN MANUAL "OPEN" SWITCH AND "CLOSE" LIMIT SWITCH FOR "CLOSE" RELAY INHIBIT CIRCUIT.

(B) NO EFFECT.

(C) NO EFFECT.

(D) NO EFFECT.

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(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE CHATTERING ACTION OF ASSOCIATED AC MOTOR VALVE ABOUT THE "OPEN" POSITION OF THE VALVE BECAUSE OF THE CYCLIC OPENING AND CLOSING OF THE "OPEN" CONTACTS OF THE LIMIT SWITCH. CYCLIC ENERGIZING OF THE AC MOTOR VALVE DRIVE IN CONJUNCTION WITH BELLOWS LEAK MAY LEAD TO A POSSIBLE DETONATION CONDITION. REQUIRES TWO OTHER FAILURES ("OPEN" INHIBIT DIODE FROM MANUAL "CLOSE" SWITCH FAILS OPEN, BELLOWS LEAK) BEFORE THE EFFECT IS MANIFESTED. FAILURE IS NOT DETECTABLE IN FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS. BELLOWS LEAK 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 F, ITEM NO. 3 - DIODE.

(B) GROUND TURNAROUND TEST

V43CAO.070 - REDUNDANT CIRCUIT VERIFICATION (PERIODIC) - CRB/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.