

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS FMEA NO 05-6L -2260A -1 REV:03/14/8
ASSEMBLY : AFT MCA 1,2,3 CRIT. FUNC: 1F
P/N RI : JANTXVIN4246 CRIT. HDW: 3
P/N VENDOR:
QUANTITY : 16 VEHICLE 102 103 104
EFFECTIVITY: X X X
: SIXTEEN PHASE(S): PL X LO X OO X DO X LE
: (TWO PER VALVE)

REDUNDANCY SCREEN: A-PASS B-FAIL C-PAS
PREPARED BY: DES D SOVEREIGN APPROVED BY: DES *P. J. R. B...* APPROVED BY (NASA):
REL F DEFENSOR REL *[Signature]* REL *[Signature]*
QE J COURSEN QE *[Signature]* QE *[Signature]*
SPEC 554 *[Signature]* for WC
EPD&C REL *[Signature]* 2/14/80

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

FUNCTION:
PROVIDES INHIBIT INPUT FROM "CLOSE" MANUAL SWITCH TO THE "OPEN" HYBRID RELAY AND PROVIDES BLOCKING FROM THE "OPEN" LIMIT SWITCH TO THE "CLOSE" MANUAL 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 - 56V76A116A2CR18, 30, 35, 36; LEFT - 54V76A114A1CR32, 33, 56, 61. VALVE B: RIGHT - 55V76A115A2CR15, 16, 120; LEFT - 55V76A115A1CR55, 56, A2CR21, 22. FOR OV-103 AND SUBS: VALVE A: RIGHT - 56V76A116A2CR21, 22, 65, 68; LEFT - 54V76A114A1CR36, 37, 66, 68. VALVE B: RIGHT - 55V76A115A1CR12, 24, 28, 29; LEFT - 55V76A115A1CR30, 31, 95, 96.

FAILURE MODE:
OPENS, FAILS TO CONDUCT, HIGH RESISTANCE.
(COCKPIT SWITCH IN THE "CLOSE" POSITION.)

CAUSE(S):
CONTAMINATION, THERMAL STRESS, MECHANICAL SHOCK, VIBRATION.

EFFECT(S) ON:
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTION CRITICALITY
(A) DISABLES "OPEN" INHIBIT SIGNAL FROM "CLOSE" MANUAL SWITCH.
(B) NO EFFECT.
(C) NO EFFECT.
(D) NO EFFECT.

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

(B) GROUND TURNAROUND TEST

V43CAO.070 - REDUNDANT CIRCUIT VERIFICATION (PERIODIC) - ORB/PO
PERFORMED FOR FIRST FLIGHT AND AT FIVE FLIGHT INTERVALS OR FOR 1
RETEST PER FIGURE V43200.000 OR FOR ORBITER DISRUPTED COPPER PATH
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
(GPC) POSITION.