

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS FMEA NO 05-6L -2253 -1 REV:10/30/87

ASSEMBLY : AFT MCA 1,3 CRIT. FUNC: 1R
 P/N RI : JANTXVLN4246 CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 12 EFFECTIVITY: X X X
 : TWELVE PHASE(S): PL X LO X OO X DO X LS X
 : (THREE PER VALVE PAIR)

PREPARED BY: REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
 DES D SOVEREIGN APPROVED BY: APPROVED BY (NASA):
 REL F DEFENSOR DES P. S. R. Bussard SSM
 QE J COURSEN REL [Signature] 11-14-87 REL [Signature] 12-7-87
 QE [Signature] 11/27 QE [Signature]
 EPD&C SSM APPROVED FOR NASA LOGG

ITEM:

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

FUNCTION:

PROVIDES INPUT FROM THE "CLOSE" MANUAL SWITCH TO THE "CLOSE" HYBRID RELAY AND PROVIDES BLOCKING FROM THE "CLOSE" MDM COMMAND TO THE "CLOSE" 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. OV-102: VALVE A: RIGHT - 54V76A114A1CR25, 26, 109; LEFT - 54V76A114A1CR27, 28, 55. VALVE B: RIGHT - 56V76A116A2CR23, 24, 60; LEFT - 56V76A116A2CR27, 28, 32. OV-103 AND SUBSEQUENT: VALVE A: RIGHT - 54V76A114A1CR30, 31, A2CR48; LEFT - 56V76A114A3CR32, 33, 66. VALVE B: RIGHT - 56V76A116A2CR48, 49, A3CR33; LEFT - 56V76A116A3CR13, 39, 40.

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) FUNCTIONAL CRITICALITY

(A) LOSS OF ABILITY TO ENERGIZE THE AFFECTED AC "CLOSE" MOTOR VALVE DRIVE CIRCUIT.

(B) ASSOCIATED AC MOTOR VALVE DRIVE "CLOSE" CIRCUIT REQUIRES CLOSURE OF TWO SETS OF RELAY CONTACTS IN SERIES BEFORE THE DRIVE IS ENERGIZED. LOSS OF ABILITY TO CLOSE ONE OXIDIZER OR FUEL TANK ISOLATION VALVE A OR B OF ONE OMS POD WILL PRECLUDE PROPELLANT ISOLATION CAPABILITY THAT MAY LIMIT CROSSFEED OPERATIONS.

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(C,D) FIRST FAILURE HAS NO EFFECT.

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO FAILURE OF TANK ISOLATION VALVE TO CLOSE; MAY RESULT IN GAS INGESTION TO GOOD ENGINE DURING CROSSFEED OPERATION.

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/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.

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

(E) OPERATIONAL USE

NO ACTION FIRST FAILURE, VALVE IS NORMALLY OPEN. IF ENGINE FAILURE REQUIRES CROSSFEED, USE PROPELLANT FROM OPPOSITE POD FIRST TO AVOID GAS INGESTION.