

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS

FMEA NO 05-6L -2028 -2

REV:10/30/87

ASSEMBLY : PANEL 08

P/N RI : ME452-0102-7206

P/N VENDOR:

QUANTITY : 4

: FOUR

: (TWO FOR EACH POD)

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

CRIT. FUNC: 1R

CRIT. HDW: 3

PREPARED BY:

DES D SOVEREIGN

REL F DEFENSOR

QE J COURSEN

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

APPROVED BY:

DES *D.S. [Signature]*

REL *[Signature]* 11-12-87

QE *[Signature]* 1-2/87

APPROVED BY (NASA):

SSM *[Signature]*

REL *[Signature]* 12-4-87

QE *[Signature]*

EPD&C Orbiter for S.S. Stagg

ITEM:

SWITCH, TOGGLE, 2 POLES, 3 POSITIONS (OPEN, GPC, CLOSE), LEFT AND RIGHT OMS CROSSFEED VALVE A AND B.

FUNCTION:

PROVIDES THE CREW THE CAPABILITY TO CHOOSE GENERAL PURPOSE COMPUTER (GPC) CONTROL OF THE LEFT AND RIGHT OMS CROSSFEED VALVES A AND B OR TO OPEN OR CLOSE THE VALVES MANUALLY THROUGH THE PANEL SWITCH OPERATION. 33V73A8S26, S27, S28, S29.

FAILURE MODE:

INADVERTENTLY TRANSFERS TO CLOSE, PREMATURE TRANSFER TO CLOSE, FAILED IN THE "CLOSE" POSITION (BOTH CONTACT SETS).

CAUSE(S):

CONTAMINATION, MECHANICAL SHOCK, VIBRATION, PIECE PART STRUCTURAL FAILURE.

EFFECT(S) ON:

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

(A) OVERRIDES EXISTING GPC COMMAND DURING ASCENT IF DIFFERENT AND ENERGIZES ASSOCIATED CIRCUIT RELAYS. LOSS OF REDUNDANCY.

(B) IF SWITCH FAILS IN THE "CLOSE" POSITION, ASSOCIATED CROSSFEED VALVE IS ENERGIZED CLOSE. THIS FAILURE HAS NO EFFECT SINCE THE PARALLEL CROSSFEED VALVE CAN COMPLETE THE FUNCTION. GPC WILL SELECT ALTERNATE VALVE DURING AN ABORT DUMP.

(C) NO EFFECT ON THE FIRST FAILURE.

(D) NO EFFECT ON THE FIRST FAILURE.

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(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF CONTROL OF ELECTRICAL POWER NECESSARY FOR THE OPERATION OF CROSSFEED VALVES. INABILITY TO CROSSFEED PROPELLANT COULD RESULT IN INABILITY TO UTILIZE OR DEplete PROPELLANT FROM OMS POD. REQUIRES TWO OTHER FAILURES (PARALLEL CROSSFEED VALVE FAILS CLOSED, LOSS OF OTHER OMS ENGINE) BEFORE THE EFFECT IS MANIFESTED. ONE POLE OF THE TOGGLE SWITCH THAT CONTROLS THE OPERATION OF THE FUEL CROSSFEED VALVE A OR B IS NOT DETECTABLE IN FLIGHT DUE TO LACK OF MONITORING SWITCH SCAN MEASUREMENTS.

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

(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

USE REDUNDANT FLOW PATH. IF REDUNDANT PATH FAILS, EARLY MISSION TERMINATION IS REQUIRED.