

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS

FMEA NO 05-6KF-2032 -2

REV: 11/03/87

ASSEMBLY : PANEL 08
 P/N RI : ME452-0102-7210
 P/N VENDOR:
 QUANTITY : 1
 : ONE
 :

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 J BEEKMAN
 QE

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 APPROVED BY:
 DES P. S. DeBueno
 REL Alfred C. Smith 11-14-87
 QE W. L. Smith

APPROVED BY (NASA):
 SSM [Signature]
 REL [Signature]
 QE [Signature]

ITEM:

MOMENTARY TOGGLE SWITCH (2P3T) HERMETIC SEAL - FORWARD RCS FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVE MANUAL CONTROL.

FUNCTION:

PROVIDES THE CREW WITH THE CAPABILITY TO SELECT GENERAL PURPOSE COMPUTER (GPC) OR MANUAL (OPEN, CLOSE) CONTROL OF THE FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVES. 33V73A8S34.

FAILURE MODE:

SHORT, INTERNAL SHORTS

CAUSE(S):

PIECE PART STRUCTURAL FAILURE, MECHANICAL SHOCK, VIBRATION, FRACTURED ROLLER, RETAINER (LOOSE ROLLER AND SPRING).

EFFECT(S) ON:

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

(A) INTERNAL CONTACT SHORTING MAY ENERGIZE SOME SERIES ELEMENTS IN THE CIRCUIT. HOWEVER, IT WOULD REQUIRE ADDITIONAL FAILURES FOR CONTINUOUS SOLENOID POWERING.

(B) LOSS OF CAPABILITY TO REPOSITION VALVE THROUGH SWITCH OPERATION.

(C, D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO VALVE OVERHEATING LEADING TO FUEL DECOMPOSITION AND VALVE RUPTURE. REQUIRES TWO ADDITIONAL FAILURE (OPEN SWITCH DIODE FAILS OPEN, TYPE III OPEN DRIVER FAILS ON) BEFORE EFFECT IS MANIFESTED. THE FAILURE STRING COULD BE UNDETECTABLE AFTER THE FIRST FAILURE DUE TO LACK OF MEASUREMENT INDICATIONS FOR THE TYPE III AND TYPE IV HYBRID DRIVERS.

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DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION & RATIONALE REFER TO APPENDIX A, ITEM NO. 1 -
TOGGLE SWITCH.

(B) GROUND TURNAROUND TEST

COMPONENT CHECKED OUT EVERY FLIGHT DURING GROUND TURNAROUND. THE TESTING
CONSISTS OF CYCLING VALVE MANUAL SWITCHES AND/OR SENDING GENERAL PURPOSE
COMPUTER (GPC) COMMANDS TO CYCLE VALVES OR HEATERS WHILE MONITORING
VEHICLE INSTRUMENTATION TO DETERMINE IF COMPONENTS HAVE FAILED.

(E) OPERATIONAL USE

NO ACTION FOR FIRST FAILURE - NOT DETECTABLE. IF CONTINUOUS POWER
SITUATION EXISTS, REMOVE POWER FROM GROUND DRIVER BY PULLING CIRCUIT
BREAKER. CIRCUIT BREAKER WILL BE RESET WHEN THE VALVE IS TO BE MOVED.