

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2207 -1

REV: 11/03/87

ASSEMBLY : AFT MCA 2,3
 P/N RI : MC477-0261-0002
 P/N VENDOR:
 QUANTITY : 4
 : FOUR
 :

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

CRIT. FUNC: LR
 CRIT. HDW: 2

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

PREPARED BY:
 DES D SOVEREIGN
 REL J BEERMAN
 QE

APPROVED BY:
 DES D. J. R. Berman SSM
 REL W. J. ... REL ...
 QE ... QE ...
 EPD&C 204

ITEM:

HYBRID DRIVER CONTROLLER (HDC) TYPE I - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER TANK ISOLATION VALVE 3/4/5 A AND B EVENT INDICATOR CLOSE DRIVERS.

FUNCTION:

UPON RECEIVING STIMULI FROM TWO, VALVE "CLOSED" POSITION SWITCHES AND A SERIES HYBRID DRIVER, THE ASSOCIATED DRIVER CONDUCTS AND ENERGIZES THE CONNECTED EVENT INDICATOR AND RELAY INHIBIT LOGIC INPUT CIRCUITS. 55V76A115AR11,13, 54V76A114AR10,12.

FAILURE MODE:

LOSS OF OUTPUT, FAILS TO CONDUCT, INADVERTENTLY OPENS.

CAUSE(S):

PIECE PART FAILURE, MECHANICAL OR THERMAL SHOCK, VIBRATION.

EFFECT(S) ON:

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

(A) LOSS OF "TALKBACK" INDICATION AND "CLOSE" RELAY INHIBIT LOGIC INPUT.

(B) LOSS OF ISOLATION VALVE "CLOSE" RELAY INHIBIT LOGIC WHEN THE MANUAL SWITCH IS IN THE "CLOSE" POSITION. THIS ALLOWS THE ASSOCIATED VALVE DRIVE TO BE CONTINUOUSLY ENERGIZED.

(C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO VALVE CONTINUOUS POWER IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES 1 OTHER FAILURE (BELLOWS LEAK) BEFORE EFFECT IS MANIFESTED. A BELLOWS LEAK IS UNDETECTABLE EXCEPT BY PERFORMING A SNIFF CHECK OF THE VALVE'S ACTUATOR ON THE GROUND.

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DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER.

(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

IF VALVE IS CLOSED, REMOVE POWER FROM RELAY BY PLACING MANUAL SWITCH IN GENERAL PURPOSE COMPUTER (GPC) POSITION.