

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - APT-RCS

FMEA NO 05-6KA-2219 -1

REV: 11/03/87

ASSEMBLY : AFT LCA 1,2
 P/N RI : MC477-0261-0002
 P/N VENDOR:
 QUANTITY : 4
 : FOUR
 :

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

CRIT. FUNC: 1R
 CRIT. HDW: 2

PREPARED BY:

DES D SOVEREIGN
 REL J BEEKMAN
 QE

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

APPROVED BY:

DES D. S. R. Berman
 REL Melvin P. Chinn 11-16-87
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ITEM:

HYBRID DRIVER CONTROLLER (HDC) TYPE I - LEFT AND RIGHT APT RCS FUEL TANK ISOLATION VALVE 3/4/5 A AND B LIMIT SWITCH TALKBACK AND LOGIC CIRCUITS.

FUNCTION:

NORMALLY OPEN TANK ISOLATION VALVES ARE CLOSED FOR RTLS ABORT AND SOME CROSSFEED OPERATIONS. UPON RECEIVING PROPER STIMULI FROM THE ASSOCIATED LEFT AND RIGHT FUEL TANK ISOLATION VALVE "CLOSED" LIMIT SWITCH, THE DRIVER CONDUCTS AND PROVIDES LOGIC INPUT TO AN ASSOCIATED DRIVER FOR PANEL TALKBACK INDICATION AND AN ASSOCIATED HYBRID RELAY FOR MOTOR VALVE END OF TRAVEL CUTOFF. 54V76A121AR (J4-5, 115). 55V76A122AR (J4-5, 115).

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 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.