

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2127 -1

REV: 11/03/87

ASSEMBLY : AFT MCA 1,2  
 P/N RI : MC455-0135-0001  
 P/N VENDOR:  
 QUANTITY : 8  
 : EIGHT  
 :

ABORT,	CRIT. FUNC:	2
RTLS, TAL	CRIT. HDW:	2
VEHICLE	102	103 104
EFFECTIVITY:	X	X X
PHASE(S):	PL	LO X CO X DO LS

PREPARED BY:  
 DES D SOVEREIGN  
 REL J BEEKMAN  
 QE

REDUNDANCY SCREEN: A- B- C-  
 APPROVED BY: APPROVED BY (NASA):  
 DES *[Signature]* SSM *[Signature]*  
 REL *[Signature]* REL *[Signature]*  
 QE *[Signature]* QE *[Signature]*

ITEM:

HYBRID RELAY - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER TANK ISOLATION VALVES 3/4/5 A AND B DRIVER POWER "CLOSE" RELAY.

FUNCTION:

UPON RECEIVING THE PROPER STIMULI (FROM EITHER THE GENERAL PURPOSE COMPUTER (GPC) OR THE CREW), THE HYBRID RELAYS OPERATE TO ENERGIZE TANK ISOLATION VALVES 3/4/5 A AND B. UNIQUE TO INTACT ABORT.  
 54V76A114K25,27,29,31. 55V76A115K25,26,27,31.

FAILURE MODE:

FAILS TO TRANSFER, FAILS TO CONDUCT, FAILS TO CLOSE.

CAUSE(S):

CONTAMINATION, PIECE PART FAILURE, VIBRATION, THERMAL STRESS, MECHANICAL SHOCK.

EFFECT(S) ON:

- (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
- (A) LOSS OR DEGRADATION OF ABILITY TO ENERGIZE THE AFFECTED VALVE DRIVE CIRCUIT.
- (B) LOSS OF ABILITY TO CLOSE ONE PROPELLANT TANK ISOLATION VALVE 3/4/5 A AND B. LOSS OF TANK ISOLATION CAPABILITY. LOSS OF ABILITY TO PERFORM CROSSFEED OPERATIONS.
- (C) LOSS OF SOME MISSION OBJECTIVES.
- (D) NO EFFECT ON CREW/VEHICLE SAFETY FOR NOMINAL MISSION - CRITICALITY INCREASED TO 1/1 DURING RTLS AND TAL ABORT. VALVE UTILIZED BY MCA OPTIMIZATION SOFTWARE IN "LANDING HEAVY" CONDITION. WILL ALSO RESULT IN CONTROL PROBLEMS DURING ENTRY. RESULTS IN LOSS OF 12 AFT RCS THRUSTERS BEING USED DURING THE OMS DUMP.

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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 C, ITEM NO. 1 -  
HYBRID RELAY.

(B) GROUND TURNAROUND TEST

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

(E) OPERATIONAL USE

AVOID CROSSFEED/INTERCONNECT TO AFFECTED LEG. LOSS OF INTERCONNECT  
CAPABILITY MAY RESULT IN MISSION MODIFICATION. —