

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2224 -2

REV: 11/03/87

ASSEMBLY : AFT PCA 3  
 P/N RI : MC477-0264-0002  
 P/N VENDOR:  
 QUANTITY : 2  
 : TWO  
 :

	VEHICLE	102	103	104
EFFECTIVITY:		X	X	X
PHASE(S):		PL X	LO X	OC 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. J. R. Bunker  
 REL Melvin C. Hove  
 QE P. J. R. Bunker  
 APPROVED BY (NASA):  
 SSM [Signature]  
 REL [Signature]  
 QE [Signature]  
 EPD&C was reviewed by [Signature] 12/10/87

ITEM:

HYBRID DRIVER CONTROLLER (HDC) TYPE IV - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVE, "OPEN/CLOSE" POWER GROUND CIRCUITS.

FUNCTION:

UPON COMMAND FROM THE MANUAL SWITCH OR GENERAL PURPOSE COMPUTER (GPC) INITIATED SIGNALS, THE DRIVER CONDUCTS AND COMPLETES THE CIRCUIT TO GROUND FOR BOTH THE "OPEN" AND "CLOSE" SOLENOID COILS, IN CONJUNCTION WITH OTHER SERIES ELEMENTS.  
 56V76A30AR (J2-A') AND (J2-L).

FAILURE MODE:

INADVERTENT OUTPUT, SHORT, INADVERTENTLY CONDUCTS

CAUSE(S):

PIECE PART FAILURE, MECHANICAL OR THERMAL SHOCK, VIBRATION.

EFFECT(S) ON:

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

(A) DEGRADATION OF REDUNDANCY AGAINST INADVERTENT SOLENOID COIL POWERING.

(B) NO EFFECT - OTHER SERIES ELEMENTS MUST BE CONDUCTING BEFORE THE VALVE SOLENOID COIL IS ENERGIZED TO CHANGE THE VALVE POSITION.

(C, D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO VALVE OVERHEATING AND PROPELLANT DECOMPOSITION BY CONTINUOUS SOLENOID COIL POWERING LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES 2 OTHER FAILURES (TYPE I "OPEN" DRIVER ON, TYPE III "OPEN" DRIVER ON). 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 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

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.