

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2213A -2

REV:11/03/87

ASSEMBLY : AFT PCA 3
 P/N RI : MC477-0263-0002
 P/N VENDOR:
 QUANTITY : 2
 : TWO
 :

	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: APPROVED BY (NASA):
 DES D.S. R. Berman SSM
 REL M. J. ... 11-14-87 REL
 QE ... QE

ITEM:

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

FUNCTION:

UPON RECEIVING PROPER LOGIC INPUTS, THE DRIVERS, IN CONJUNCTION WITH OTHER SERIES ELEMENTS, CONDUCT AND CONTROL "OPEN" COIL CURRENT TO THE FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVE SOLENOIDS IN RESPONSE TO THE MANUAL SWITCH OR GENERAL PURPOSE COMPUTER (GPC) COMMANDS. 56V76A30AR(J8-Z) AND (J8-V).

FAILURE MODE:

INADVERTENT OUTPUT, SHORT, INADVERTENTLY CONDUCTS

CAUSE(S):

PIECE PART FAILURE, CONTAMINATION, 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 IV OPEN/CLOSE DRIVER 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 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.