SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS FMEA NO 05-6RA-2213 -2 REV:11/03/87

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

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL X LO X OO X DO X LS X

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

PREPARED BY:
DES D SOVEREIGN
REL J BEERMAN
QE

APPROVED BY:
DES
REL
QE

APPROVED BY (NASA):
SSM
REL
QE

ITEM:
HYBRID DRIVER CONTROLLER (HDC) TYPE III - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVES, "CLOSE" POWER CIRCUITS.

FUNCTION:
UPON A GENERAL PURPOSE COMPUTER (GPC) OR CREW INITIATED (MANUAL SWITCH) COMMAND, THE DRIVERS, IN CONJUNCTION WITH OTHER SERIES ELEMENTS, CONDUCTS AND CONTROLS THE "CLOSE" COIL CURRENT TO THE FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVE SOLENOIDS. 56V76A123AR (J12-Q',N').

FAILURE MODE:
INADVERTENT OPERATION, SHORT, INADVERTENTLY CONDUCTS.

CAUSE(S):
PIECE PART FAILURE, CONTAMINATION, MECHANICAL AND 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 - REQUIRES ADDITIONAL FAILURES BEFORE SOLENOID CIRCUIT CAN BE ENERGIZED CONTINUOUSLY.

(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 TWO OTHER FAILURES (REMOTE POWER CONTROLLER FAILS 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.