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PRINT DATE: 04/13/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE
 NUMBER: 05-6KF-2178 -X

SUBSYSTEM NAME: EPD&C - FORWARD REACTION CONTROL (03-2A)
 REVISION: 1 02/06/95

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: FWD FCA 3	V070-763360
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-1050
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-2050
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-3050
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-4050

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

REMOTE POWER CONTROLLER (5 AMP) - FORWARD RCS FUEL AND OXIDIZER
 MANIFOLD 5 ISOLATION VALVES "OPEN" SERIES POWER CIRCUITS.

REFERENCE DESIGNATORS: 83V76A24RPC29

QUANTITY OF LIKE ITEMS: 1
 ONE

FUNCTION:

UPON RECEIVING A STIMULUS FROM THE ASSOCIATED HYBRID DRIVER, THE REMOTE
 POWER CONTROLLER CONDUCTS AND CONTROLS "OPEN" COIL CURRENT TO THE FUEL
 AND OXIDIZER MANIFOLD 5 ISOLATION VALVE SOLENOIDS IN CONJUNCTION WITH
 OTHER SERIES ELEMENTS. THE COILS CAN BE ENERGIZED THROUGH SEPARATE
 CIRCUITS COMMANDED FROM THE GENERAL PURPOSE COMPUTER (GPC) OR A
 MANUAL SWITCH.

- APPROVALS -

PAE MANAGER : K. L. PRESTON
 PRODUCT ASSURANCE ENGR : N. HAFEZIZADEH
 DESIGN ENGINEERING : D. SOVEREIGN
 NASA EPD&C SUBSYS MGR :
 NASA SUBSYS MGR :
 NASA EPD&C SSMA :
 NASA SSMA :

K.L. Preston 4/12/95
N. Hafezizadeh
D. Sovereign
D. Sovereign - F. ALAOUIS 3/16/95
 N/A
D. Sovereign 3-16-95
 N/A

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS

FMEA NO 05-SKF-2178 -2

REV: 11/03/8

ASSEMBLY : FWD PCA 3
 P/N RI : MC450-0017-1050
 P/N VENDOR:
 QUANTITY : 1
 : ONE
 :

CRIT. FUNC: 1R
 CRIT. HDW: 3
 VEHICLE 102 103 104
 EFFECTIVITY: X X X
 PHASE(S): PL X LO X OO X DO X LS X

PREPARED BY:
 DES D SOVEREIGN
 REL J BEEKMAN
 QE

REDUNDANCY SCREEN: A-PASS B-FAIL C-PAS
 APPROVED BY: APPROVED BY (NASA):
 DES D. S. R. B... SSM [Signature]
 REL Moham... 11-14-87 REL [Signature]
 QE [Signature] QE RJ [Signature]
 epd&c sec [Signature]
 Feb 11, 1988

ITEM:

REMOTE POWER CONTROLLER (5 AMP) - FORWARD RCS FUEL AND OXIDIZER MANIFOLD ISOLATION VALVES "OPEN" SERIES POWER CIRCUITS.

FUNCTION:

UPON RECEIVING A STIMULUS FROM THE ASSOCIATED HYBRID DRIVER, THE REMOTE POWER CONTROLLER CONDUCTS AND CONTROLS "OPEN" COIL CURRENT TO THE FUEL AND OXIDIZER MANIFOLD ISOLATION VALVE SOLENOIDS IN CONJUNCTION WITH OTHER SERIES ELEMENTS. THE COILS CAN BE ENERGIZED THROUGH SEPARATE CIRCUITS COMMANDED FROM THE GENERAL PURPOSE COMPUTER (GPC) OR A MANUAL SWITCH. 83V76A24RPC29.

FAILURE MODE:

INADVERTENT OUTPUT, 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,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. REQUIRE 2 OTHER FAILURES (TYPE III 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.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS

FMEA NO 05-6KF-2178 -2

REV:11/03/87

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. 2 - REMOTE POWER CONTROLLER.

(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 SERIES "CLOSE" DRIVER FAILS ON, MINIMIZE POSSIBILITY OF CONTINUOUS POWER BY PULLING CIRCUIT BREAKER. CIRCUIT BREAKER WILL BE RESET WHEN THE VALVE IS TO BE MOVED.