

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE**

NUMBER: 05-6WD-4080 -X

SUBSYSTEM NAME: EPD&amp;C - ATCS/FCL

REVISION: 0

12/02/97

**PART DATA**

	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	: PANEL L2A1	V070-730273
SRU	:CAPACITOR, 0.56MF	M83421/01-4231M

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

CAPACITOR 0.56MF, MOTOR ISOLATION VALVE PORT (OR STARBOARD), FREON LOOP BYPASS VALVE CONTROL SUBSYSTEM.

**REFERENCE DESIGNATORS:** TB1A1C3,  
TB1A2C3,  
TB2A1C3,  
TB2A2C3

**QUANTITY OF LIKE ITEMS:** 4  
FOUR

**FUNCTION:**

CAPACITOR PROVIDES PROPER PHASING FOR REVERSING MOTORS IN ISOLATION VALVES.

**FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE**

NUMBER: 05-6WD-4080- 02

REVISION#: 0 12/02/97

SUBSYSTEM NAME: EPD&amp;C - ATCS/FCL

LRU: TB1

ITEM NAME: CAPACITOR, 0.56 MF

CRITICALITY OF THIS  
FAILURE MODE: 1R3**FAILURE MODE:**

FAILS SHORT (END-TO-END)

**MISSION PHASE:**LO LIFT-OFF  
OO ON-ORBIT**VEHICLE/PAYLOAD/KIT EFFECTIVITY:**102 COLUMBIA  
103 DISCOVERY  
104 ATLANTIS  
105 ENDEAVOUR**CAUSE:**PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING  
ANOMALY, THERMAL STRESS

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

**REDUNDANCY SCREEN**A) PASS  
B) FAIL  
C) PASS**PASS/FAIL RATIONALE:**

A)

B)

CANNOT ISOLATE THE FAIL SHORT OF THIS CAPACITOR WITH USING INTRUSIVE  
PROCEDURES.

C)

**- FAILURE EFFECTS -****(A) SUBSYSTEM:**

NONE FIRST FAILURE, WILL LOSE ONE OF TWO REDUNDANT ISOLATION VALVE MOTORS.

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**(B) INTERFACING SUBSYSTEM(S):**  
NONE FIRST FAILURE.

**(C) MISSION:**

PROBABLE LOSS OF MISSION AFTER 3 FAILURES: (1) CAPACITOR MOTOR ONE STARBOARD ISOLATION VALVE (OR CAPACITOR MOTOR ONE PORT ISOLATION VALVE) FAILS SHORT, (2) CAPACITOR MOTOR TWO STARBOARD ISOLATION VALVE (OR CAPACITOR MOTOR TWO PORT ISOLATION VALVE) FAILS CLOSED WILL CAUSE LOSS OF BOTH ISOLATION MOTORS FOR ONE COOLANT LOOP, AND (3) EXTERNAL LEAK RADIATOR ARRAY STARBOARD (OR PORT) CAUSES LOSS OF ONE COOLANT LOOP.

**(D) CREW, VEHICLE, AND ELEMENT(S):**

POSSIBLE LOSS OF CREW/VEHICLE AFTER 4 FAILURES: (1) CAPACITOR MOTOR ONE STARBOARD ISOLATION VALVE (OR CAPACITOR MOTOR ONE PORT ISOLATION VALVE) FAILS SHORT, (2) CAPACITOR MOTOR TWO STARBOARD ISOLATION VALVE (OR CAPACITOR MOTOR TWO PORT ISOLATION VALVE) FAILS SHORT, (3) EXTERNAL LEAK RADIATOR ARRAY STARBOARD (OR PORT) CAUSES LOSS OF ONE COOLANT LOOP AND (4) LOSS OF REDUNDANT COOLANT LOOP CAUSING LOSS OF ALL VEHICLE COOLING.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

PROBABLE LOSS OF MISSION AFTER 3 FAILURES: (1) CAPACITOR, MOTOR ONE STARBOARD ISOLATION VALVE (OR CAPACITOR, MOTOR ONE PORT ISOLATION VALVE) FAILS SHORT, (2) CAPACITOR, MOTOR TWO STARBOARD ISOLATION VALVE (OR CAPACITOR, MOTOR TWO PORT ISOLATION VALVE) FAILS SHORT OPEN CAUSES LOSS OF BOTH MOTORS FOR ISOLATION VALVE FOR ONE COOLANT LOOP, AND (3) EXTERNAL LEAK RADIATOR ARRAY STARBOARD (OR PORT) CAUSING LOSS OF ONE COOLANT LOOP SINCE CANNOT ISOLATE THAT RADIATOR ARRAY.

POSSIBLE LOSS OF CREW/VEHICLE AFTER 4 FAILURES: (1) CAPACITOR, MOTOR ONE STARBOARD ISOLATION VALVE (OR CAPACITOR, MOTOR ONE PORT ISOLATION VALVE) FAILS SHORT, (2) CAPACITOR, MOTOR TWO STARBOARD ISOLATION VALVE (OR CAPACITOR, MOTOR TWO PORT ISOLATION VALVE) FAILS SHORT CAUSES LOSS OF BOTH ISOLATION VALVE MOTORS FOR COOLANT LOOP, (3) EXTERNAL LEAK RADIATOR ARRAY STARBOARD (OR PORT) CAUSING LOSS OF ONE COOLANT LOOP SINCE ISOLATION VALVE CANNOT GO TO ISOLATION WITHOUT MOTORS AND (4) LOSS OF REDUNDANT COOLANT LOOP CAUSING LOSS OF ALL VEHICLE COOLING.

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**-DISPOSITION RATIONALE-**

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**(A) DESIGN:**  
REFER TO APPENDIX C, ITEM #1 - HYBRID RELAY.

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(B) TEST:

REFER TO APPENDIX C, ITEM #1 - HYBRID RELAY.

GROUND TURNAROUND TEST

TOGGLE SWITCH IS VERIFIED PRIOR TO EACH FLIGHT.

(C) INSPECTION:

REFER TO APPENDIX C, ITEM #1 - HYBRID RELAY.

(D) FAILURE HISTORY:

REFER TO APPENDIX C, ITEM #1 - HYBRID RELAY.

(E) OPERATIONAL USE:

NONE.

- APPROVALS -

SS & PAE MANAGER  
SS & PAE ENGINEER  
EPD&C ATC  
BNA SSM  
JSC MOD  
JSC RDE  
USA/Dsbiter

: D. F. MIKULA  
: K. E. RYAN  
: D. SOVEREIGN  
: R. L. PHAN  
:

*D.F. Mikula*  
*K.E. Ryan TLD*  
*D. Sovereign*  
*R. L. Phan*  
*H. Stankovich*  
Nineteenth Corner 11-74-98  
*Signature* 1-4-  
*1/19/99*