

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE  
NUMBER: 05-6WD-4010 -X**

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

REVISION: 0 12/02/97

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**PART DATA**


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	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	: PANEL L4	V070-730273
SRU	: CIRCUIT BREAKER	MC454-0026-2030

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**  
CIRCUIT BREAKER (3 AMP), FREON LOOP BYPASS VALVE CONTROL SUBSYSTEM.

**REFERENCE DESIGNATORS:** 31V73A4CB137

**QUANTITY OF LIKE ITEMS:** 1  
ONE

**FUNCTION:**  
CB 137 PROVIDES SINGLE-PHASE AC POWER TO MOTOR ONE OF THE TWO REDUNDANT MOTORS USED TO ACTUATE THE PORT AND STARBOARD ISOLATION VALVES.

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

NUMBER: 05-6WD-4010-01

REVISION#: 0 12/02/97

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

LRU: PANEL L4

ITEM NAME: CIRCUIT BREAKER

CRITICALITY OF THIS

FAILURE MODE: 1R3

**FAILURE MODE:**

FAILS OPEN, FAILS TO CONDUCT, FAILS TO CLOSE

**MISSION PHASE:**

OO ON-ORBIT

DO DE-ORBIT

**VEHICLE/PAYLOAD/KIT EFFECTIVITY:**

102	COLUMBIA
103	DISCOVERY
104	ATLANTIS
105	ENDEAVOUR

**CAUSE:**STRUCTURAL FAILURE, MECHANICAL SHOCK, THERMAL STRESS, VIBRATION,  
CONTAMINATION, PROCESSING ANOMALY**CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO****REDUNDANCY SCREEN**

A) PASS

B) N/A

C) PASS

**PASS/FAIL RATIONALE:**

A)

B)

NSTS 22205 PARAGRAPH 3.4.4.A.2 STATES: CB'S, SWITCHES, RELIEF VALVES, ETC.  
CONSIDERED STANDBY REDUNDANT THEREFORE SCREEN B IS N/A.

C)

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

AFTER FIRST FAILURE LOSS OF ISOLATION VALVE MOTOR REDUNDANCY.

## FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE

NUMBER: 05-6WD-4010-01

**(B) INTERFACING SUBSYSTEM(S):**

NONE FIRST FAILURE.

**(C) MISSION:**

PROBABLE LOSS OF MISSION AFTER 3 FAILURES: (1) CB137 FAILS OPEN, (2) CB138 FAILS OPEN CAUSING LOSS ABILITY OF ISOLATION VALVE TO GO TO RAD BYPASS, (3) EXTERNAL LEAK IN ASSOCIATED RADIATOR ARRAY.

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

POSSIBLE LOSS OF CREW/VEHICLE AFTER FOUR ASSOCIATED FAILURES: (1) CB137 FAILS OPEN, (2) CB138 FAILS OPEN CAUSING LOSS OF ABILITY OF ISOLATION VALVE TO GO TO RAD BYPASS, (3) EXTERNAL LEAK IN ASSOCIATED RADIATOR ARRAY, AND (4) LOSS OF REDUNDANT COOLANT LOOP.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

FAILURE SCENARIO FOR CB137

PROBABLE LOSS OF MISSION AFTER 3 FAILURES: (1) CIRCUIT BREAKER 137 FAILS OPEN, (2) CIRCUIT BREAKER 138 FAILS OPEN CAUSING LOSS OF ABILITY OF ISOLATION VALVE TO GO TO RAD BYPASS, AND (3) EXTERNAL LEAK IN RADIATOR OF ASSOCIATED RADIATOR. POSSIBLE LOSS OF CREW/VEHICLE AFTER FOUR ASSOCIATED FAILURES: (1) CIRCUIT BREAKER 137 FAILS OPEN, (2) CIRCUIT BREAKER 138 FAILS OPEN CAUSING LOSS OF ABILITY OF ISOLATION VALVE TO GO TO RAD BYPASS, AND (3) EXTERNAL LEAK IN RADIATOR OF ASSOCIATED RADIATOR, AND (4) LOSS OF REDUNDANT COOLING LOOP CAUSING LOSS OF ALL VEHICLE COOLING.

**- APPROVALS -**

SS & PAE MANAGER	: D. F. MIKULA
SS & PAE ENGINEER	: K. E. RYAN
EPD&C ATC	: D. SOVEREIGN
BNA SSM	: R. L. PHAN
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