

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE**  
**NUMBER: 05-6-2293B-X**

**SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION AND CONTROL**  
**REVISION: 1 03/22/94**

	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
{	LRU : AFT PCA 5	VO70-765280
	SRU : FUSE, 100 AMP	ME451-0016-0100

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**PART DATA**

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**  
 FUSE, 100 AMP, HIGH CURRENT - MAIN DC BUS B, AFT PCA 5 TO AFT LCA 2

**REFERENCE DESIGNATORS: 55V76A135F6**

**QUANTITY OF LIKE ITEMS: 1**  
 ONE, APCA 5

**FUNCTION:**  
 CONDUCTS CIRCUIT CURRENT AND PROVIDES OVERCURRENT PROTECTION FOR  
 MAIN DC BUS B BETWEEN AFT POWER CONTROLLER ASSEMBLY NO. 5 AND AFT LOAD  
 CONTROLLER ASSEMBLY NO. 2.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – CRITICAL FAILURE MODE**  
**NUMBER: 05-6-2293B-01**

REVISION# 1 03/22/94

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION AND CONTROL

LRU: AFT PCA 5

CRITICALITY OF THIS

ITEM NAME: FUSE, 100 AMP

FAILURE MODE: 1R2

FAILURE MODE:  
FAILS OPEN

MISSION PHASE:  
LO LIFT-OFF

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA  
 103 DISCOVERY  
 104 ATLANTIS  
 105 ENDEAVOUR

CAUSE:  
STRUCTURAL FAILURE, CONTAMINATION, THERMAL STRESS, MECHANICAL SHOCK,  
VIBRATION, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? YES  
 RTLS RETURN TO LAUNCH SITE  
 TAL TRANS ATLANTIC ABORT

REDUNDANCY SCREEN A) PASS  
 B) PASS  
 C) PASS

PASS/FAIL RATIONALE:  
 A)  
 B)  
 C)

**- FAILURE EFFECTS -**

(A) SUBSYSTEM:  
LOSS OF MAIN DC BUS B POWER TO AFT LOAD CONTROLLER ASSEMBLY NO. 2.

(B) INTERFACING SUBSYSTEM(S):  
LOSS OF MAIN DC BUS B AFT LCA-2 (55V76A122) LOADS.

(C) MISSION:  
NO EFFECT - FIRST FAILURE

(D) CREW, VEHICLE, AND ELEMENT(S):  
NO EFFECT - FIRST FAILURE

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL FAILURE MODE  
NUMBER: 05-6-22938-01

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

POSSIBLE LOSS OF CREW/VEHICLE AFTER TWO FAILURES:

(1) FUSE FAILS OPEN CAUSING THE LOSS OF MAIN DC BUS B POWER TO AFT LCA 2 LOADS - INADVERTENT OPENING OF ONE GH2 FLOW CONTROL VALVE DUE TO LOSS OF POWER.

(2) THE PARALLEL GH2 FLOW CONTROL VALVE FAILS OPEN RESULTING IN EXCESSIVE LH2 ULLAGE PRESSURE CAUSING ET VENT VALVE TO RELIEVE EXCESS PRESSURE. POTENTIAL FIRE/EXPLOSION HAZARD EXTERIOR TO THE VEHICLE AND POSSIBLE VIOLATION OF THE ET MAXIMUM STRUCTURAL CAPABILITY REQUIREMENTS.

CRITICALITY 1/1 DURING RTLS AND TAL ABORTS. LOSS OF MAIN DC BUS B POWER TO AFT LCA 2 WILL CAUSE THE INABILITY TO OPEN ONE OF TWO SERIES LH2 HELIUM MANIFOLD REPRESSURIZATION VALVES. FAILURE RESULTS IN LOSS OF LH2 MANIFOLD REPRESSURIZATION (MANDATORY TO PRECLUDE FLAMMABLE CONCENTRATIONS IN THE LH2 PROPELLANT SYSTEM) CAUSING FIRE/EXPLOSION HAZARD IN THE LH2 PROPELLANT SYSTEM.

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-DISPOSITION RATIONALE-

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**(A) DESIGN:**

REFER TO APPENDIX D, ITEM NO. 3 - FUSE, HIGH CURRENT

**(B) TEST:**

REFER TO APPENDIX D, ITEM NO. 3 - FUSE, HIGH CURRENT

**GROUND TURNAROUND TEST**

ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

**(C) INSPECTION:**

REFER TO APPENDIX D, ITEM NO. 3 - FUSE, HIGH CURRENT

**(D) FAILURE HISTORY:**

FAILURE HISTORY IS TRACKED IN THE PRACA SYSTEM.

**(E) OPERATIONAL USE:**

NONE

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- APPROVALS -

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PAE MANAGER : K. PRESTON  
 PRODUCT ASSURANCE ENGR : T. KIMURA  
 DESIGN ENGINEERING : J. GULSBY  
 NASA SSMA :  
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