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PRINT DATE: 01/13/94

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE  
NUMBER: 05-6N-2025-X**

**SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT**

**REVISION: 2 01/13/94**

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	<b>PART NAME VENDOR NAME</b>	<b>PART NUMBER VENDOR NUMBER</b>
LRU	: AFT LCA 1	MC450-0057-0001
LRU	: AFT LCA 2	MC450-0058-0001
LRU	: AFT LCA 3	MC450-0059-0001
SRU	: DIODE	JANTXV1N5551

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**PART DATA**

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

DIODE, GROUND MDM ISOLATION (3 AMP) - AUXILIARY POWER UNIT (APU) FUEL ISOLATION CONTROL CIRCUIT

**REFERENCE DESIGNATORS: ASSEMBLY NO. 1:**

54V76A207A2CR17  
54V76A207A2CR18  
54V76A207A3CR17  
54V76A207A3CR18

**ASSEMBLY NO. 2:**

55V76A208A2CR16  
55V76A208A2CR19  
55V76A208A2CR19

**ASSEMBLY NO. 3:**

56V76A209A1CR19  
56V76A209A1CR20  
56V76A209A2CR16  
56V76A209A2CR17

**AFT LCA-2:**

55V76A208(J9-99)

**QUANTITY OF LIKE ITEMS: 12**

**TWELVE**

**FUNCTION:**

TO ISOLATE GROUND MDM FROM APU FUEL ISOLATION VALVE DRIVER.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – CRITICAL FAILURE MODE  
NUMBER: 05-6N-2025-02**

REVISION# 2 01/13/94

SUBSYSTEM NAME: EPD&amp;C - AUXILIARY POWER UNIT

LRU: AFT LCA 1, 2, 3

ITEM NAME: DIODE

CRITICALITY OF THIS

FAILURE MODE: 1R3

**FAILURE MODE:**

SHORT (END-TO-END)

**MISSION PHASE:**

OO ON-ORBIT

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

**CAUSE:**

STRUCTURAL FAILURE, (MECHANICAL STRESS, VIBRATION), CONTAMINATION,  
ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY

**CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO**

**REDUNDANCY SCREEN**      A) PASS  
   B) FAIL  
   C) PASS

**PASS/FAIL RATIONALE:**

A)

B)

FIRST FAILURE NOT DETECTABLE IN FLIGHT SINCE THE SHORT FAILURE MODE OF  
THIS DIODE DOES NOT AFFECT THE FUNCTIONAL OPERATION OF THE SYSTEM  
UNLESS THERE ARE ADDITIONAL ASSOCIATED FAILURES.

C)

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

LOSS OF MDM ISOLATION AND REDUNDANT CIRCUIT ISOLATION.

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

NO EFFECT - FIRST FAILURE

**(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: 05-6N-2025-02**

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

POSSIBLE LOSS OF CREW/VEHICLE AFTER THREE OTHER FAILURES (TWO OF FOUR SWITCH CONTACT SETS FAIL CLOSE, INABILITY TO MECHANICALLY OPEN CIRCUIT BREAKER) WHICH COULD ALLOW SOLENOID ENERGIZING AND OVERHEATING ON ORBIT WHEN APU FUEL FLOW COOLING IS ABSENT. PROBABLE FUEL (HYDRAZINE) DECOMPOSITION AND VALVE/LINE RUPTURE.

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**-DISPOSITION RATIONALE-**

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**(A) DESIGN:**

REFER TO APPENDIX F, ITEM NO. 4 - DIODE

**(B) TEST:**

REFER TO APPENDIX F, ITEM NO. 4 - DIODE

GROUND TURNAROUND TEST - FUEL ISOLATION VALVE GROUNDING CIRCUIT TESTS PERFORMED EVERY FIFTH FLOW.

**(C) INSPECTION:**

REFER TO APPENDIX F, ITEM NO. 4 - DIODE

**(D) FAILURE HISTORY:**

REFER TO APPENDIX F, ITEM NO. 4 - DIODE

**(E) OPERATIONAL USE:**

NONE

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**- APPROVALS -**

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EDITORIALLY APPROVED : RI  
EDITORIALLY APPROVED : JSC  
TECHNICAL APPROVAL : VIA CR

*Sumit*  
*Sumit*  
: *Sumit*  
CRB/003 5502702  
1/20/94