

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE  
NUMBER: 05-6N-2074A-X**

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

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

	<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	: CONTROLLER, HYBRID DRIVER	MC477-0263-0002

**PART DATA**

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**  
CONTROLLER, HYBRID DRIVER, HOC TYPE 3 - AUXILIARY POWER UNIT (APU) HEATERS,  
FUEL PUMP/LINE 1, 2 AND 3 POWER CIRCUITS

**REFERENCE DESIGNATORS:** 54V76A121AR(J7-30)  
54V76A121AR(J7-56)  
54V76A121AR(J10-m)  
54V76A121AR(J10-CC)

55V76A122AR(J7-30)  
55V76A122AR(J7-56)  
55V76A122AR(J10-m)  
55V76A122AR(J10-CC)

56V76A123AR(J7-30)  
56V76A123AR(J7-56)  
56V76A123AR(J10-m)  
56V76A123AR(J10-CC)

**QUANTITY OF LIKE ITEMS: 12  
TWELVE**

**FUNCTION:**  
CONDUCTS POWER TO THE APU 1, 2, AND 3 FUEL PUMP AND LINE HEATERS.

SHOULDER CRITICAL ITEMS LIST - CABINER

S050260M  
ATTACHMENT -  
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SUBSYSTEM : EPD&C - AUXILIARY PWR FMEA NO 05-6N -2074A -1 REV:01/07/91

ASSEMBLY : AFT LCA 1,2,3				CRIT. FUNC: 1R
P/N RI : MC477-0263-0002				CRIT. HDW: 2
P/N VENDOR:	VEHICLE	102	103	104
QUANTITY : 12	EFFECTIVITY:	X	X	X
: TWELVE	PHASE(S):	PL	LO	CO X DO LS

PREPARED BY:		REDUNDANCY SCREEN: A-PASS B-PASS C-PASS	
DES	T NGUYEN	APPROVED BY:	APPROVED BY (NASA):
REL	T KIMURA	<i>J.M. Anderson 1-21-91</i>	SSM <i>John W. ... for 41 Sept 2 3-3</i>
QE	W R HIGGINS	<i>Michael G. ... 1-23-91</i>	REL <i>Michael G. ... 1-23-91</i>
		<i>J.R. ... 1-23-91</i>	QE <i>K.C. ... 1/28/91</i>
			EPDC Rel <i>John W. ... 1-23-91</i>
			EPDC SSM <i>John W. ... 1-23-91</i>

ITEM:  
CONTROLLER, HYBRID DRIVER, HDC TYPE 3 - AUXILIARY POWER UNIT (APU)  
HEATERS, GAS GENERATOR/FUEL PUMP 1, 2, AND 3 POWER CIRCUITS

FUNCTION:  
CONDUCTS MAIN BUS POWER TO THE APU 1, 2, AND 3 FUEL PUMP/LINE/VALVE HEATERS.  
54V76A121AR(J7-30), (J7-56), (J10-B), (J10-CC);  
55V76A122AR(J7-30), (J7-56), (J10-B), (J10-CC);  
56V76A123AR(J7-30), (J7-56), (J10-B), (J10-CC)

FAILURE MODE:  
LOSS OF OUTPUT, FAILS TO CONDUCT, FAILS TO TURN "ON"

CAUSE(S):  
PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK,  
PROCESSING ANOMALY, THERMAL STRESS

EFFECT(S) ON:  
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL  
CRITICALITY EFFECT:

(A) LOSS OF CAPABILITY TO CONDUCT MAIN BUS POWER TO THE HEATERS.  
(B) LOSS OF ONE OF TWO LINE/PUMP/VALVE HEATERS TO ONE APU.  
(C,D) NO EFFECT - FIRST FAILURE  
(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (LOSS OF OUTPUT OF  
HDC IN REDUNDANT HEATER CIRCUIT) WHICH RESULTS IN LOSS OF FUEL  
PUMP/LINE/VALVE HEATERS TO THE SAME APU CAUSING FUEL (HYDRAZINE) FREEZING  
AND LINE RUPTURE UPON THAWING.

SUBSYSTEM : EPD&C - AUXILIARY FWR FMEA NO 05-6N -2074A -1 REV:01/07/91

**DISPOSITION & RATIONALE:**

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE:

**(A-D) DISPOSITION AND RATIONALE**

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER

**(B) TEST**

APU 1/2/3 HEATER TEST BY COCKPIT COMMAND PERFORMED IN FLIGHT EVERY FLOW OF AFTER CIG RETEST. ADDITIONALLY, BOTH 'A' AND 'B' GAS GENERATOR/FUEL PUMP HEATER SYSTEMS ARE VERIFIED TO BE FUNCTIONING NORMALLY PRIOR TO LAUNCH AND AFTER ART COMPARTMENT

**(E) OPERATIONAL USE**

FIRST FAILURE - SELECT ALTERNATE HEATER

ELASOAT.

DWY  
2-13-91