

# **Chapter 24**

## **Electrical Power**

## TABLE OF CONTENTS

Chapter	Title	
<b>24-00-00</b>	<b>GENERAL</b> .....	<b>3</b>
<b>24-30-00</b>	<b>DC-GENERATION</b> .....	<b>4</b>
<b>24-31-00</b>	<b>MAINTENANCE PRACTICES</b> .....	<b>6</b>
24-31-01	Battery .....	6
24-31-02	Master Relay .....	6
<b>24-60-00</b>	<b>DC ELECTRICAL LOAD DISTRIBUTION</b> .....	<b>8</b>
<b>24-61-00</b>	<b>MAINTENANCE PRACTICES</b> .....	<b>9</b>
24-61-01	Combined Switch and Circuit Breaker .....	9
24-61-02	Lever Switch .....	10
24-61-03	Subminiature Pushbutton Switch .....	10

## **24-00-00**

## **GENERAL**

This Chapter describes the electrical power system and its operation. This covers the battery system and the alternator system.

The battery system consists of the dryfit A200G (A212/24G) battery (Sonnenschein GmbH, Büdingen, Germany), the master relay and the associated wiring. The battery is located at the left engine side of the firewall; the master relay at the left cockpit side of the firewall.

The alternator system consists of the alternator (ALX8421, Electrosystems) with integrated DC converter and the B-00371-25 Lamar alternator control box which contains an voltage regulator adjusted to 13.8 Volts and an overvoltage trip cutting the circuit at 16 volts. The alternator is mounted at the right front of the engine. The alternator control box is located at the upper left of the firewall (engine side).

## 24-30-00

## DC-GENERATION

(Refer to Chapter 91) Power for the electrical system is provided by an alternator and/or the battery. The alternator serves as the main component to power the electrical system and charge the battery during normal conditions. The battery is used for starting the engine and powering the electrical system when alternator power is not available (engine not running). The battery also powers the electrical system in case of alternator failure.

A rocker type master switch is used for energizing the master relay, which connects power to the electrical system.

The voltage regulator, receiving power from the battery via the master switch in combination with the field circuit breaker/switch, energizes the alternator field. With the alternator field energized, the operating alternator will produce an output to the electrical system. The voltage regulator varies the output voltage of the alternator to meet the requirements of the electrical system loads. An ammeter is installed into the system to provide an indication of current flow from or to the battery.

The negative side of the battery is connected to the aircraft steel tube design (negative ground). This provides a ground for the system through use of the steel tube design. The positive side of the battery is connected to the coil of the master relay. This relay remains in relaxed state until the master switch is placed to the ON-position. Placing the master switch in the ON-position provides a ground for the master relay energizing this relay. With the master relay energized, a circuit exists from the battery through an ammeter to the bus bar.

The bus bar powers the electrical equipment and accessories furnished on the aircraft. The energized master relay will also allow power from the battery to the starter relay.

Placing the 5 amp field circuit breaker/switch to the ON-position likewise will provide a circuit from the bus bar through a 40 amp alternator circuit breaker to the voltage regulator. The voltage regulator will supply and regulate voltage to the alternator field and protects circuit against

overvoltage. With the alternator operating (engine running) and the field energized, the alternator will develop electrical power. The alternator supplies power to the bus bar through the 40 amp alternator circuit breaker. With the alternator power available, the battery will be charged from the bus bar. The ammeter, which is in series with the battery and the bus bar will indicate the current flow to the battery. When the battery reaches a state of full charge, the ammeter will show an indication near "0".

## 24-31-00

## MAINTENANCE PRACTICES

### **I M P O R T A N T**

**If replacement of wiring passing the firewall is necessary, renew the sealing of the bushing grooves and gaps at the engine side of the firewall. Use PRC-812 (Products Research & Chemical Corporation, USA) firewall sealant.**

## 24-31-01

### **Battery**

#### **Removal/Installation**

### **C A U T I O N**

**Ensure the master switch is in Off-position.**

- 1 Remove the engine cowlings as per Chapter 51-00-01.
- 2 Disconnect the electrical wiring.
- 3 Remove the 4 attachment nuts (LN9348-06) and the top attachment frame.
- 4 Lift the battery out of its bottom frame and then remove.
- 5 Install in reverse sequence of removal.

## 24-31-02

### **Master Relay**

#### **Removal/Installation**

### **C A U T I O N**

**Ensure the master switch is in Off-position.**

- 1 Remove the upper engine cowling and main fuselage cover as per Chapter 51-00-01.
- 2 Disconnect electrical wiring.
- 3 Remove the DIN933 M5x12 attachment bolts, the DIN9021 M5x20 washers and the LN9348-05 stopnuts.

- 4 Remove the master relay.
- 5 Install in reverse sequence of removal.

## **24-60-00**

## **DC ELECTRICAL LOAD DISTRIBUTION**

(Refer to Chapter 91) From the main bus the electrical load is distributed through switches, circuit breakers and combined switch/circuit breakers.

The switches and / or circuit breakers are located at the rear instrument panel so as the lever switches. Subminiature pushbutton switches are mounted on the control sticks and the throttle controls.



## 24-61-00

## MAINTENANCE PRACTICES

### **I M P O R T A N T**

If replacement of wiring passing the firewall is necessary, renew the sealing of the bushing grooves and gaps at the engine side of the firewall. Use PRC-812 (Products Research & Chemical Corporation, USA) firewall sealant.

## 24-61-01

## Combined Switch and Circuit Breaker

### Removal/Installation

### **C A U T I O N**

#### Disconnect battery

- 1 Remove the instrument panel cover per Ch. 31.
- 2 Disconnect the tubings from the resp. instruments.
- 3 Remove the instrument panel attachment screws.
- 4 Turn down the panel.
- 5 Loosen the bus bar attachment screws and remove bus bar if necessary.
- 6 Disconnect wiring.
- 7 Remove the attachment nut at the front side of the instrument panel.
- 8 Remove the combined switch and circuit breaker.
- 9 Install in reverse sequence of removal.

## 24-61-02

### Lever Switch

#### Removal/Installation

#### CAUTION

#### Disconnect battery

- 1 Remove the instrument panel cover per Ch. 31.
- 2 Disconnect the tubings from the resp. instruments.
- 3 Remove the instrument panel attachment screws.
- 4 Turn down the panel.
- 5 Disconnect wiring.
- 6 Remove the attachment nut at the front side of the instrument panel.
- 7 Remove the combined switch and circuit breaker.
- 8 Install in reverse sequence of removal.

## 24-61-03

### Subminiature Pushbotton Switch

#### Removal/Installation

#### CAUTION

#### Disconnect battery

- 1 Remove the attachment nut.
- 2 Tie out the switch some centimeters.
- 3 Loosen the soldered connections.
- 4 Remove the switch.
- 5 Install in reverse sequence of removal