



Section IV

Electrical Systems

There are actually two interrelated electrical systems used in your motorhome: the 12-volt dc supply system; and the 120-volt ac supply system. The 12-volt dc supply system is divided into several branches, or zones, each functioning from the common 12-volt battery source. One branch provides the 12 volts required for the automotive starting, ignition and lighting systems; remaining branches supply those motorhome circuits and appliances which require 12 volts dc for operation.

The 120-volt ac system includes those motorhome appliances which require 120-volts for their operation, supplied from either the internal generator; or from the external 120-volt ac (or a split 240-volt ac) supply, via the shoreline hookup; or from the battery-powered 120-volt motor generator unit.

12-Volt DC Supply System

Wiring diagrams of the 12-volt supply and distribution system are included in Section X.

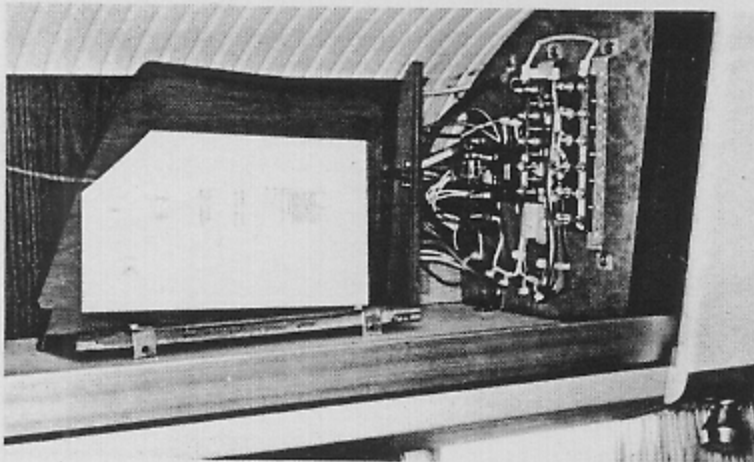


Figure 4-1. Typical Load Center

The 12 volts supplied to all motorhome appliances, outlets and accessories is routed from the batteries through a main 12-volt master switch and routed through busses to the individual branches, or zones, that are serviced from this supply. Circuit breakers are located behind the access panel at the top front left side of the coach, lower front load

center (behind left headlight panel) and at each of the zones. The circuits supplied and fuse- or circuit-breaker-protection at each zone are shown on a diagram attached to each zone panel. Copies of these diagrams are included in Section X for reference purposes. A typical load center is shown in figure 4-1.

Battery Heaters

120 volt ac battery heater pads provide faster engine starts during cold weather conditions by increasing the available cold cranking power. Heaters operate only from the ac supply line via the **Battery Heater** switch located on the living room sofa front (behind pilot's seat).

Note

To avoid premature deterioration of the batteries, heaters should be used only when the temperature is below 32°F.

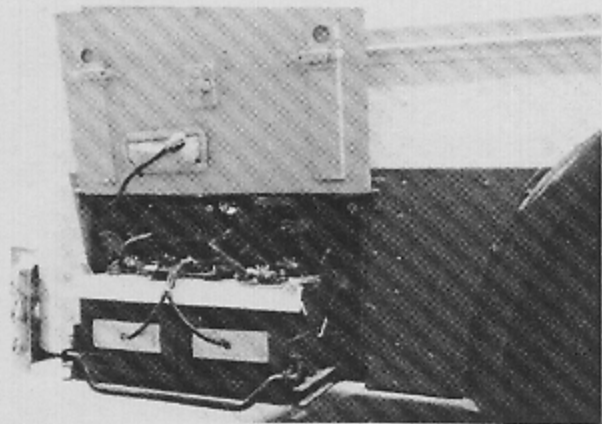


Figure 4-2. Battery Compartment

Battery Chargers

The 12-volt engine battery supply, figure 4-2, and the generator battery are maintained fully-charged by either the engine alternator (when engine operates); or by two 50-ampere battery charger/converters. These automatic electronic battery chargers operate whenever a source of 120 volts ac is supplied to the coach circuits. The two chargers furnish a total of 100 amperes of ser-



vice to the 12v. d.c. motorhome circuits. Chargers are in left (road) side compartment in front of rear wheels.

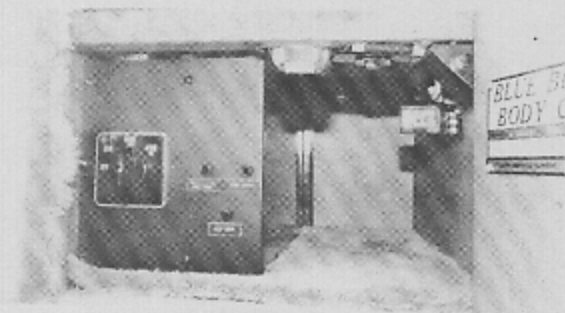


Figure 4-3. Stepwell Compartment

Batteries can become discharged because of coach 12-volt loads, while parked, without a 120-volt ac source. For overnight stops this presents no problem, with judicious use of 12v. service, because the engine alternator will recharge the batteries rapidly during the next day's travel. When operating from shoreline or generator power, the batteries obtain the major portion of the charge during "sleeping" time, while coach loads are low, so that the battery chargers can "top off" the batteries.

If it is planned to leave the coach parked without exterior power for a week or longer turn off the **Electronic Master** switch in overhead cabinet adjacent to left front load center. This will ensure that there is no drain from the circuits which remain on when the **Master** (under dash) switch is **Off** (clock, memory and LPG leak detector).

DC Supply Monitors

The **ENG. AMP. METER**, located on the lower dash, indicates the total current flow from the charging source (engine alternator or battery chargers).

The **CHARGE** ammeter, located on the upper right auxiliary dash, shows the current flow into the

coach batteries.

The **DISCHARGE** ammeter, also located on the upper right auxiliary dash, shows the load drawn by coach circuits.

ENG. VOLT METER, located on lower dash, shows voltage at **Master** switch behind lower dash.

While in transit, this should reflect an alternator regulated setting of 14v. When parked, with 120v. source supplied, this should read between 12.5 and 14.0v. depending upon load. When parked, without 120v. source, do not permit voltage to drop below 11.5.

After a trip, **CHARGE** ammeter will show some discharge reading, even when 120v. source is supplied, if there is a load on the 12v. coach circuits. The **Float** type battery chargers allow a voltage of 12.5-13 when there is a load.

AC Supply System

Motorhome ac-operated appliances are supplied from either an external shoreline hookup or from the on-board generator. Selection of shoreline or generator power source is determined by a four-position ac power selector switch located in the stepwell compartment, figure 4-3. Set this switch to either **Gen**, **Shore 50A**, **Shore 30A** or **Off**, depending on the power source availability. Leave this switch in **Off** position to completely disconnect the motorhome 120-volt ac circuits normally supplied by these inputs.

Power Line Monitors

A dual power line monitor is located on the galley wall to monitor the voltage in both legs of the ac shoreline supply (or generator supply). Each monitor has polarity and ground detector circuits to indicate possible electrical hazards due to incorrect hookups.

AC Circuit Breaker Panels

Two main ac circuit breaker panels are located within the curb-side closet adjacent to the galley closet. Refer to figures 4-4 and 4-5 for identification and location of load center distribution panel board and 30 A. shoreline circuit breakers, respectively.

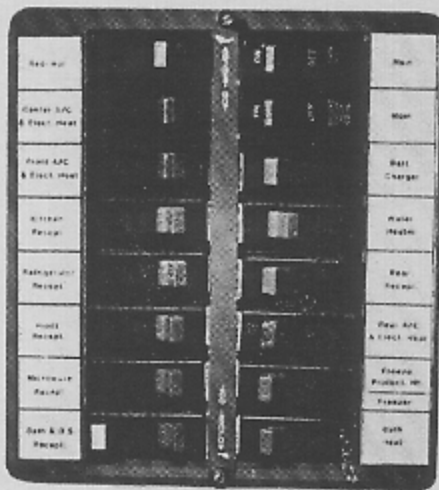


Figure 4-4. Load Center Circuit Breakers

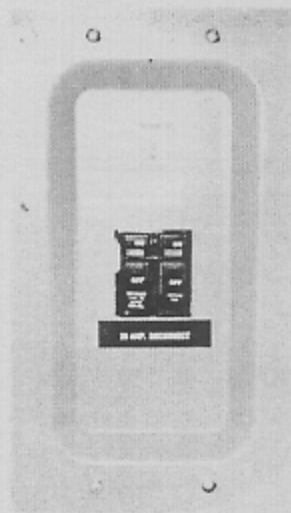


Figure 4-5. 30A. Shoreline Circuit Breakers

Generator Operation

The generator plant has its own 12-volt starting battery so that it can be started independently of the coach 12-volt batteries.

The generator can be started and stopped from either of two locations within the coach: at the driver's instrument panel; or at the systems Monitor Panel. In addition, the generator can also be started in the generator compartment.

To start the generator, push the **Generator** switch to the **Start** position and hold until the generator starts, as indicated by the generator **On** indicator light. **Do not hold switch on for longer than 15 seconds at a time!** If the

generator does not start the first time, wait a minute and try again. Release the switch when the indicator light in the switch glows. The generator may be stopped at any time, from either of the two locations in the coach, or with the **Start-Stop** switch in the generator compartment, figure 4-6, by holding the switch to the **Stop** position until the generator stops (light in switch extinguishes).

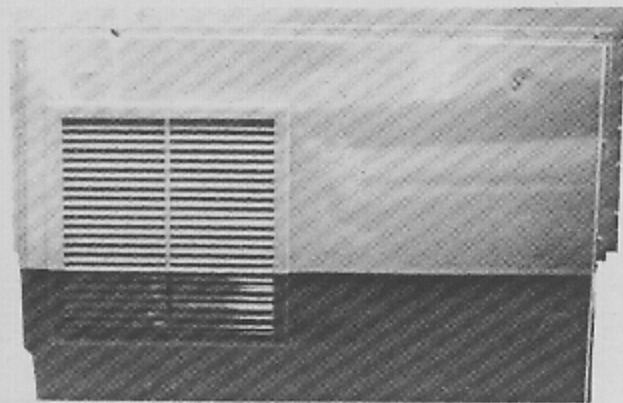


Figure 4-6. Generator Tray

It is not advisable to start the generator under a heavy load, especially with the high current demands made by the air conditioners. This may cause hard starting and possible damage to the generator electrical system. It is a good practice to remember to set the **Main Selector** switch to **Off** (figure 4-3) before turning on the generator so there will be no electrical load on the line. Also, remember to set the selector switch to **Gen** position when the generator is being used; and to reset the switch to either **Off** or **Shore** position, as appropriate.

The generator is housed within an air operated extendable tray which is normally locked into place by a hand-latch located underside, figure 4-6. To open, unlock the latch by moving forward and extend the tray outward by operating the **Out-In Gen. Tray** switch in the stepwell compartment, figure 4-3. **Note: Latch handle for 7.5 K.W. generator is on door exterior and upward movement will unlatch.** If the ignition switch is turned **On** while the generator tray is still in the extended position, or if the tray is not locked properly, the Digitell unit will continuously announce — **Secure door on APU.**



Caution

The generator tray is **heavy** and moves in and out with a great deal of force. **Keep Hands Off Tray When Operating Switch!**

Shoreline Operation (Commercial Power)

Set the power selector switch, figure 4-4, to **Off** position **before** the motorhome electrical system and external supply are joined.

Caution

Your motorhome has been wired in accordance with the National Electrical Code. All 120-volt ac wiring is two-wire service with ground; all 240-volt wiring is three-wire service with ground. If the motorhome is connected to an external hookup which has only a two-wire circuit, ground the third wire on the adapter to the external supply metal junction box or conduit. For personal safety, check the polarity detector indicators on the power line monitors to be sure that lines are properly connected and grounded.

For purposes of safety, observe all precautions when making these connections. First, connect the shoreline to the coach (**rotate plug clockwise to assure firm connections**) (the coach receptacles are located in the same compartment as the water hookups, in the rear pilot's side, figure 5-1); then connect it to the power source. Set the power selector switch to the appropriate **Shore** position. Poor grounding or incorrectly-wired receptacles can cause personal harm as well as equipment damage or fire hazards. Check power line monitors on Systems Monitor Panel to verify correct supply voltage, polarity and grounding of hookup.

In many instances, the shoreline hookups will not be rated to operate all electrical appliances in your coach. Check with facility personnel to determine the maximum current capability of the hookup. Sometimes, only one air conditioner may be operated. The current ratings for appliances designated for standard or optional (identified by *) usage in your coach are listed in table 4-1.

Table 4-1. Electrical Ratings for Motorhome Appliances

| Item | Current Rating (Amperes) |
|--|--------------------------|
| Air Conditioners | |
| 14,500 BTU | (Start) 19.0 |
| Water Heater | 10.0 |
| Television Receivers | |
| Black-and-white | .5 |
| Color | 1.0 |
| Battery Chargers (depends on battery condition/load) | 0 to 12.0 |
| Engine Block Heater | 10.0 |
| Electric Heaters | |
| "Cheater Heater" | 12.5 |
| Battery Heaters | 1.2 |
| Heat Tapes | 3 watts/ft |
| *Microwave Oven | 14.0 |
| Food Center | 4.0 |
| Vacuum Cleaner System | 9.0 |
| Refrigerator | 2.5 |
| *Ice-Maker | 2.5 |
| *Washing Machine/Dryer | 25.0 |
| Instant Hot Water | 6.5 |
| | *Optional item |

Shoreline Operation — Troubleshooting

Your coach is designed and tested to make sure the 120v. ac **Neutral** (white) wire and the **Ground** (bare copper or green) are not tied together (no continuity). This will prevent any danger of a "hot skin" if the source of power has reversed polarity (red LED lit).

Problem

- Probable Cause
- Corrective Action

Green LEDs lit - Normal (desired)

Red LEDs lit

- Reversed Polarity at power source.
 - Convince park management to correct or change lot assignment.

Neither red or green LED lights

- No ground connection with park service
 - Use jumper lead from ground pin on shore cord to service box.



Power source (park) circuit breaker trips.

- Reversed polarity in park and coach neutral and ground tied together.
- Use on-board generator until qualified electrician can correct coach problem. (Generator polarity is correct).

Green LED's lit plus Red LED's glow when additional load is turned on (Air Conditioner or Water Heater).

- Poor ground connection at park (floating ground).
- Make sure shoreline plug is fully engaged twist locked (clockwise) at coach.

Safeline Alarm

Your coach is equipped with a shoreline disconnect alarm, which is located on the upper left auxiliary dash. This device will provide an audible or visual alarm whenever the shoreline is left connected to the coach at the same time that the ignition switch is turned **On**. This assures that the coach is not inadvertently driven away while still connected to the shoreline hookup. In addition to the Safeline-originated alarm, the Digitell unit will announce continuously that the shoreline is still connected.

Electronic Filter

12v. d.c. power for electronic equipment is supplied directly from the coach batteries through an electronic filter to the audio-video systems and monitoring panel. This eliminates electrical noise interference.

Electronic Master Switch

Most of the electronic circuits are de-energized when the main **Master** switch (behind dash) is turned **Off** (relay action). Circuits that still receive power when the **Master** switch is off serve the monitor panel, clocks, radio memory, and LPG leakage detector. If coach is to be stored for a week or more without external power, the **Electronic Master** switch in overhead adjacent to left front load center should be turned off.

Battery Jumper Terminals

For your convenience and safety when jump starting (usually someone else's vehicle), terminal posts are provided at the top front of the battery compartment, figure 4-2. Utilization of these terminal posts is described in Section VIII.