

# Service Tips from the Pros



## Auto Transfer / Line Switches

Have you ever noticed that “land yachts” actually share a variety of equipment and terminology commonly found on their floating cousins. Motorhomes have “Captains Seats,” both are equipped with deep-cycle Marine (house) battery installations that power the onboard 12-volt loads... and, in some cases, with inverters for standby 120V power. A Shore Cord is employed to connect your land yacht to 120VAC Shore Power when parked... and those docking lamps are certainly useful at night when backing. The cook can usually be found in the “Galley” at dinner time! The ATS switch is another one of those applications adopted by RV manufacturers and it made its debut some 24 years ago on the 1992 Winnebago Elante® models. Since that time, the ATS has become a popular and commonly found piece of equipment on a high percentage of the Winnebago® lineup.

The typical ATS switch – sometimes referred to as a line switch, is connected to the shore cord and to the generator’s wiring on the input side of the switch... and to the 120-volt breaker panel/load distribution panel on the output side of the switch. Ref. Figure-1.

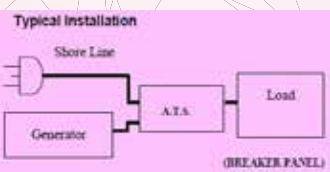


Figure-1

Arguably, the ATS switch is a simple convenience item. What it does is eliminate unnecessary handling of the shoreline cord. Visualize pulling

into a Wal-Mart parking lot on a rainy day... and starting the generator so the microwave oven can be used to make lunch. No longer will you need to run outside to the shore cord compartment and plug the shore cord into a receptacle powered by the generator, because you’re already connected!

When an ATS equipped coach is connected to an external shore source, power on the cord is connected to and passes through a set of contacts/switches inside the ATS switch enroute to the 120VAC distribution panel. The ATS switch serves as a convenient connection point between the shore cord and the load center. A typical ATS only goes to work when the generator is operating and providing power, even if the shore cord is connected to a shore power source. Simply, when

the ATS recognizes power on the generator side of the ATS switch, a timing circuit inside the ATS begins a countdown of approximately 20 to 30 seconds prior to latching/connecting the generator’s power output to the load distribution center. This delay is intentional and allows the generator to start and run briefly under a no-load condition - and also allows power output from the generator to stabilize. The “transfer” or latching process is very quick..... i.e., we’re talking microseconds. Ref. Figure-2 for wiring detail.

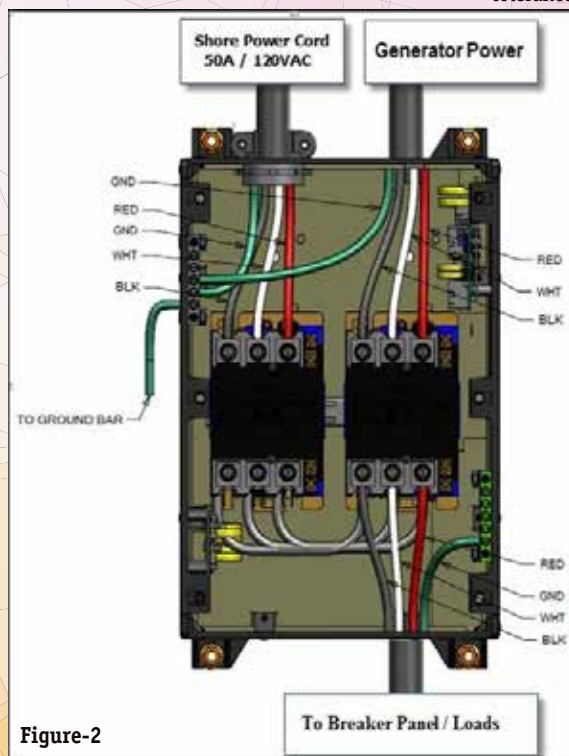


Figure-2

The design of the ATS has evolved to keep pace with the technology and power demands of the larger coaches being built today. Dishwashers, washer/dryers, 2,000W inverter/chargers, and central A/C power demands has mandated heavy-duty power cords and larger generators... and higher capacity ATS switches, too. The 1995 Luxor® was the first 50-amp. coach built by Winnebago Industries®



Figure-3

The TRC® Surge Guard™ automatic transfer switch shown in Figure-3 provides basic surge protection of 2,600 joules at 76,400 amps. Additional features include protection from shore power electrical faults such as open neutrals and reverse polarity. This ATS switch uses

“contactors” versus relays for switching purposes. A contactor is a “normally open” switch and requires power to activate/close the contacts – i.e., a 120V DC powered coil is responsible for making this occur. Have you ever heard a “humming noise” resonating from your ATS – the source is the coil... and the frequency/pitch of the noise will vary with the voltage at the coil.

### Enemies of the ATS

Most electrical switches (relays, contactors, solenoids, etc.) experience a certain amount of arcing as the contacts are being closed (turned on) or opened (shut off). Electrical engineers understand this and target specific designs based on the intended applications of their switch – including tolerances for poor voltage/high amperage and the forecasted duty cycles the switch will typically experience. A switch will certainly experience a significantly shorter service life if carrying high amperage or high voltage at the time the contacts are opening or closing. This is where the “operator” of the equipment can make a difference!

### Inspect the Shore Source:

- Assess the campgrounds shore power service. Ensure the receptacle is in pristine condition prior to plugging your shore cord into the receptacle.
- Verify the voltage at the shore power source. Purchase an inexpensive voltmeter and qualify power prior to plugging the shore cord into the receptacle. (125 volts is a bit high and 105 volts is low voltage and should be avoided.)
- Turn off the circuit breakers prior to connecting the shore cord to the shore receptacle. Turn off the shore power breakers prior to disconnecting the shore cord from the shore receptacle.

### Inspect the Shore Cord:

- Assess the condition of the shore cord and avoid usage of a cord showing any sign of loose terminals or signs of heat damage. The same cautions apply if using an extension cord or a “cheater/adaptor.”
- Insert the shore cord terminals into the shore receptacle squarely. The terminals vary in length and this isn’t by accident. The connection must be tight!
- Always “depower”/turn off electrical loads inside the coach prior to connecting or disconnecting from shore power... or prior to starting/shutting down the generator.