BASIC OPERATION GUIDE

This guide provides basic operational instructions pertaining to the components, devices, or equipment that may be installed on your motorhome. Please refer to the component manufacturer owner's manual for safety, troubleshooting, maintenance, and more detailed operating information.

THOR MOTOR COACH

Made to fit.

Generator

COMPONENT MANUFACTURER: Cummins/Onan

BASIC OPERATION

⚠ DANGER

OPERATING THE GENERATOR CREATES EXHAUST GASES THAT CONTAIN CARBON MONOXIDE. CARBON MONOXIDE IS POISONOUS AND CAN CAUSE UNCONSCIOUSNESS AND DEATH.

- **THE GENERATOR PRODUCES DANGEROUS FUMES WHEN IT IS RUNNING. SEVERE PERSONAL INJURY, DEATH, AND EQUIPMENT DAMAGE CAN RESULT FROM OPERATING THE GENERATOR IN A GARAGE, BUILDING, OR A CONFINED SPACE. WHENEVER THE MOTORHOME IS PARKED OR STORED IN A GARAGE OR CONFINED SPACE, DISABLE THE AGS SYSTEM TO PREVENT THE GENERATOR FROM AUTOMATIC OPERATION.**
- **TO AVOID EXHAUST GAS ENTRY INTO THE MOTORHOME, KEEP WINDOWS CLOSED WHEN THE CHASSIS OR GENERATOR ENGINES ARE RUNNING.**
- **Test the CO/LP detector installed in your motorhome frequently to ensure protection from carbon monoxide and/or LP gas leaks. If an alarm sounds, immediately shut off the generator and all gas and electric appliances and evacuate the motorhome. Turn off the main battery disconnect switch and main gas valve at the LP tank. Seek medical assistance if necessary. Have all necessary repairs to equipment made by a qualified technician before continuing use.**
- **Disable the AGS system when sleeping in the motorhome. The potential of carbon monoxide poisoning is present when the generator is operating and the alarm may not awake you to the hazard.**
- **When parked, be sure that the generator's exhaust is clear of any obstructions, such as underbrush, rocks, and snow. Follow all generator safety guidelines provided by TMC in your owner's manual and the instruction manual provided by the generator's manufacturer.**

⚠ CAUTION

Read and understand the generator owner's manual before operating the generator. Follow all operating instructions and warnings, as well as all recommended maintenance schedules and procedures.

Typical Cummins-Onan RV Generator

The on-board generator provides 120 volts AC energy when shore power is unavailable. Most generators are designed to operate whether the motorhome is stationary or in-motion, therefore, it is a convenient source of 120 volts AC power. As when connected to shore power, the generator also works in unison with the converter (See Converter Section) to also supply 12 volts DC to the motorhome, thus conserving house battery usage.

Always be mindful that exhaust gas produced by the generator contains deadly carbon monoxide gas! **NEVER sleep in the motorhome with the generator running.** Before you start and use the generator, inspect the exhaust system. Do not use the generator if the exhaust system is damaged. Test the carbon monoxide detector every time you use the motorhome. Know the symptoms of carbon monoxide poisoning:

If you or any of your traveling companions experiences these physical symptoms, move the person to fresh air immediately. If the physical symptoms persist, seek medical attention! Shut the generator down and do not operate it until it has been inspected and repaired by a professional technician.

- Dizziness
- Vomiting
- Nausea
- Muscular twitching
- Intense headache
- Throbbing in the temples
- Weakness and sleepiness
- Inability to think coherently

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Generator Safety Guidelines

Always follow these generator safety guidelines:

- NEVER store anything in the generator compartment. Always keep the compartment clean and dry.
- DO NOT operate the generator in an enclosed building or in a partly enclosed area, such as a garage.
- READ and follow all safety precautions for fuel and exhaust fumes found in your owner's manual.
- READ and be familiar with the instructions, cautions and warnings associated with the generator that are provided in the manufacturer's owner's guide.
- DO NOT operate the generator when the motorhome is parked in high grass or brush. Heat from the exhaust could cause a fire in dry conditions.
- NEVER operate the chassis or generator engine, or the engine of any vehicle, longer than necessary when the vehicle is parked.
- DO NOT simultaneously operate generator and a ventilator which could result in the entry of exhaust gas.
- When parked, position the motorhome so that the wind will carry the exhaust away from the motorhome. DO NOT open nearby windows, ventilators, or doors into the passenger compartment, particularly those which can be 'down wind,' even part of the time.
- DO NOT operate the generator when parked in close proximity to vegetation, snow, buildings, vehicles, or any other object which could deflect the exhaust under or into the motorhome.
- DO NOT touch the generator when running, or immediately after shutting OFF. Heat from the generator can cause burns. Allow the generator to cool before attempting maintenance or service.
- Before using the generator, inspect the exhaust system. Do not use it if the exhaust system is damaged. Test the carbon monoxide alarm every time you use the motorhome. If the CO alarm sounds, immediately move everyone to fresh air and ventilate the motorhome. Shut the generator OFF, and do not operate it until it has been inspected and repaired by a qualified technician.

Generator Power Rating

Every generator has a power capacity rating, stated in watts or kilowatts:

1,000 watts = 1 kW

Most Class C gasoline motorhomes are equipped with generators ranging from 3.2 kW to 4.0 kW. Some Class C diesel models have 6.0 kW generators. Class A motorhomes are supplied with generators ranging from 4.0 kW to 6.0 kw and up to 10.0 kW for the larger diesel models.

Often, this power rating is referred to as the generator's 'size,' which does not refer to the generator's physical dimensions, but its power-generating capacity The 'size' of the generator supplied with your motorhome was determined by the supply amperage of the motorhome, 30 amps or 50 amps, and the number of electrical circuits and features of the motorhome. Larger motorhomes typically require more power than smaller models, due to additional electrical features. It is important to know the generating capacity of your motorhome's generator and have a good knowledge of the power demands of the devices contained within the motorhome, both built-in features and the extra electrical devices you bring along with your travels. Typically, devices that use a significant amount of electrical energy are those that contain motors, compressors and electrical heating elements.

The generator has built-in overload protection, which will turn off electrical power if the demand exceeds what the generator can safely supply. This overload protection device, similar to a circuit breaker, is located on the generator's control panel. Typically, this is not a remotely mounted device. It is important not to exceed the power-generating capacity of the generator by attempting to operate too many appliances at the same time.

Starting and Stopping Procedures

Your generator can be started and stopped from the integral control panel on the generator, or from the optional remote control panels or switches located inside the motorhome. Outlined here are the simple steps for starting and stopping the generator:

- Before starting the generator, turn OFF air conditioners and large electrical loads.
- Before starting in cold weather, turn OFF all appliances for best long-term performance.

TO START:

1. Locate the Generator ON/OFF switch, on the Monitor Panel or integrated into the Multiplex Control Panel.
2. Prime the engine by holding the OFF position of the start/stop switch for a few seconds. The LED on the switch will turn on.
3. After priming, press and hold the ON position until you hear the generator start. The LED will flash during starting, then remain on when the generator is running.
   a. The engine will turn over and should start within a few seconds.
   b. If the engine fails to start within a few seconds, do not over-crank.
4. Before turning ON appliances, let the generator warm up for a few minutes. Generally, a beep from an appliance (microwave clock) indicates that the generator is supplying electricity.

Under normal operating conditions, you may detect the engine of the generator increase and decrease in RPM (run faster and slower). This is normal, due to changes in electrical power demand.

TO STOP:

1. Turn off air conditioners and large electrical loads and allow the generator to run for 3-5 minutes before stopping, to allow the generator to cool down.

2. Press and hold the OFF switch position until the generator stops. The indicator LED on the switch will turn off.

NOTES:

- To prevent generator overload due to initial start-up current demand, turn ON air conditioners and appliances in a sequential order and ONLY AFTER THE GENERATOR IS STARTED AND RUNS FOR A FEW MINUTES.
- If you lose power to the motorhome while operating the generator, check the overload circuit breaker on the generator; it may have tripped due to too much power demand. Turn off some appliances or electrical devices in order to reduce the total power demand.
- Control switches for operating the generator are located on the monitor panel or, if equipped, on the multiplex touch-screen panel.
- Your motorhome's generator may be equipped with features that prevent operation if certain maintenance parameters are not met, i.e., low engine oil level, clogged air and fuel filters, etc.
- If your generator fails to start or remain running, and there is an adequate fuel supply and 12 volts DC present, it may need maintenance attention. Refer to the manufacturer's owner's manual for troubleshooting and maintenance procedures.
- The generator will continue to run after a circuit breaker trips. Turn OFF all appliances before resetting the breaker. If the breaker trips again with all electrical loads off, turn OFF the generator and contact a qualified technician for repairs.
- If your motorhome is supplied with an AGS system, refer to your motorhome's Owner's Packet for details regarding its features, set-up programming, and operation.
- If your motorhome has a multiplex wiring system, settings for the automatic generator start system are incorporated in the Settings Menu of the multiplex system.
- For complete generator instructions, refer to the manufacturer's guidelines included in your Owner's Packet, or available through your TMC Owners Resource account, or available from the manufacturer's website.

Generator Fuel

Depending on the motorhome model, generators may be fueled by either gasoline, diesel, or propane (LP). If the generator is fueled by either gasoline or diesel, fuel for the generator is drawn from the vehicle's fuel tank. There is provision built into the fuel delivery system that prevents the generator from depleting the entire fuel supply, which could potentially leave the vehicle stranded. Fuel to the generator will be cut-off when the level in the vehicle's fuel tank reaches 1/4 full.

Select motorhome models are equipped with a LP-fueled generator. LP is drawn from the motorhome's propane tank to fuel the generator's engine. There is no fuel cut-off provision with the LP system, so it is possible for the generator to deplete the fuel in the LP tank, leaving little-to-no LP for other gas appliances.

NOTES:

- Diesel and gasoline-fueled generators require 12 volt DC power to start. Operating fuel is drawn from the motorhome's fuel tank. If the fuel level of the motorhome's fuel tank drops to or below ¼ full, the generator will automatically shut OFF and cannot be restarted until the motorhome's fuel tank is filled to above ¼ full.
- Propane-fueled generators also require 12 volt DC power to start, but draw operating fuel from the LP tank. There is no fuel-limiting provision, therefore, monitor LP usage to ensure an adequate supply of LP remains available for other LP appliances (furnace, refrigerator, stove, water heater).

Managing Electrical Loads

If you try to operate too many electrical devices at the same time, you will likely 'overload' the generator. In overload conditions, your ceiling lights may flicker or dim, or the circuit breakers on the generator or the main electrical panel may trip open, disrupting the flow of electrical power. Listed below are a few electrical devices that, because of their significant power demand, have the potential of overloading your generator:

- During start-up, air conditioners need reserve power and can draw 3-4 times the typical 1400-2400 watts needed to run. Low, or insufficient electrical power can prevent air conditioners from starting.

- Battery chargers (built into the converter) are activated automatically and can draw a large load (up to 3000 watts). Manage your electrical loads by adjusting battery charge rates to best suit your needs. Consult your inverter/charger manual or manufacturer's web site.

- If you have an automatic generator start/stop system (AGS), consult the inverter/charger owner's manual for adjustment

procedures. Adjust automatic generator control parameters to best suit your total electrical needs.

POWER DEMAND CAN BE DETERMINED BY A COUPLE OF WAYS:

1. Simply note the amperage rating of the circuit breaker (120 volts AC) or fuse (12 volts DC) within the Power Load Center that is powering the device. Then, using the power formula:

   Power (Watts) = Voltage x Current (amperage),

   you can determine the power consumption of that particular circuit.

   For example, perhaps your air conditioner is connected to a 20 amp circuit; the maximum power requirements of that circuit would be 20 amps x 120 volts, which equals 2,400 watts. Because electrical circuit loads are designed not run at maximum capacity, the actual current requirement of the air conditioner is likely less than 20 amps.

   If you total all the power ratings of the circuits you are using, then you will have a good idea of the power-generating demand that will be required from your generator.

   Again, this method calculates the circuit capacity, not the device power consumption of the device, yet, it can be a quick and useful method of determining power consumption.

2. The second, and more accurate way of determining the power demand of your devices is to add all the wattage requirements of every electrical device being operated at a given time. This will give you the total power demand of your electrical devices. Although this is a more accurate method of determining total power demand, it requires that you know, or are able to obtain, the power consumption rating of each electrical device in use (see Calculating Electrical Loads section).

Motors, and compressors require higher energy at initial start-up than at operating conditions. Therefore, to ensure the generator can supply this extra power demand, it is best to turn ON devices such as air conditioners, furnace blowers, refrigerators and other motorized appliances in a sequential order.

Power Surging

NOTICE

When operating sensitive electronic appliances or devices, such as computers, it is highly recommended to use surge protectors to prevent power surges from damaging your electronic devices.

The electrical supply (voltage and frequency) for any appliance must remain within very close limits for it to operate properly. Changes in the electrical supply, called surging, can damage the appliances in your motorhome. Proper care of your generator will enable it to supply stable power and prevent surging.

Effects of High Altitude and Extreme Temperatures

When you travel at high altitudes or in extreme temperatures, you may find that the generator is not capable of supplying the same level of energy as it would at lower altitudes or moderate temperatures. During these conditions, it may be necessary to limit the use of some electrical appliances and devices.

Power decreases 3.5% for each 1,000 feet above an altitude of 500 feet. For example, to operate at 4,500 feet altitude, multiply 3.5% (.035) x 4 (4,000 ft) = 14% power loss. Then multiply 14% (0.14) x your generator's power rating. This will give you the generator's altitude-adjusted power rating.

NOTE: The carburetor on a non-EFI gasoline generator may require adjustment at high altitudes. Refer to the generator's operating manual or contact an authorized RV generator service center.

Generator Break-in and Maintenance

NOTICE

It is very important to monitor your generator's fuel, oil and other maintenance items on a regular schedule.

The generator may be equipped with a safety feature that prevents its engine from operating if the oil level is low. Check oil level frequently. Top off and change at the manufacturer's recommended intervals.

Your generator is a rather complex piece of equipment, and as such, does require a proper break-in period and routine maintenance in order to remain in prime operating condition. It is also recommended that the generator be 'exercised' or used for at least 60 to 120 minutes every month. This brings in fresh fuel into the carburetor and helps expel excess moisture that can cause corrosion in the internal components.

NOTE: The use of fuel stabilization treatments may be helpful in order to avoid moisture build-up in the fuel-delivery components of your generator. Consult with the manufacturer of your generator for fuel-treatment recommendations.

NOTE: Refer to your generator's owner's guide for complete break-in, operating, and maintenance information.