



OWNER'S MANUAL

Beaver Motor Coaches
Bend, OR 97446
Warranty: 800-843-2967

Table of Contents

<i>Plumbing</i>	<i>1</i>
<i>Waste</i>	<i>12</i>
<i>LP Gas</i>	<i>18</i>
<i>Appliances and Equipment</i>	<i>26</i>
<i>Traveling</i>	<i>51</i>
<i>Maintenance</i>	<i>59</i>
<i>Storage</i>	<i>68</i>
<i>Service and Warranty</i>	<i>74</i>

The descriptions and specifications in this manual were in effect at the time of its approval for printing. The manufacturer reserves the right to change specifications or designs without notice and without incurring obligation. This manual includes information on several different models, your motorhome may not contain every system described.

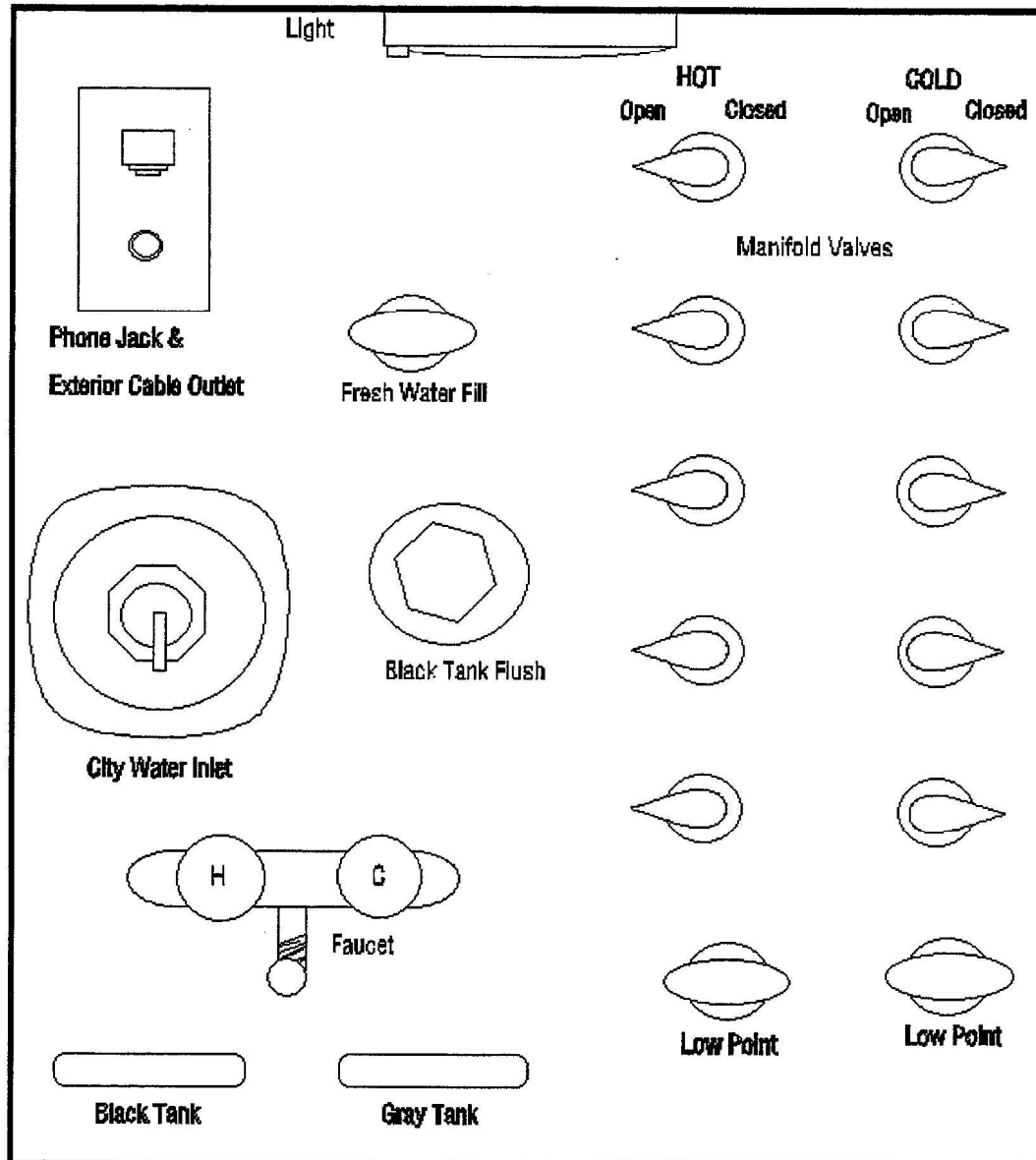
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CHAPTER ONE

PLUMBING

GENERAL OVERVIEW

Your coach contains a full freshwater plumbing system, equally capable of operating as a self-contained unit, or for taking advantage of a pressurized water source. For camping away from amenities, the system has a specially designed pump system which provides even flows even at low volumes. When a pressurized water source is available, the pump and tank can be bypassed by switching a single selector valve, and the system will draw from the source.



Fresh Water System (Generalized)

Beaver coaches have an outer compartment where all of the water flow is controlled. This manifold system includes several manifold valves, your black tank flush, city water inlet, and many other features. Depending on the model of coach you own, your manifold system may vary, but it should be similar to the one shown here. The above diagram shows how the components of the system are gathered for the manifold system. The location of the items in the diagram varies according to the model you own.

The selector valve near the fill connection controls which source the water comes from. If an external connection is used, the tank and pump are bypassed. Regardless of the connection, the water heater or Aqua-Hot hydronic heating system supplies all hot water.

USING A CONNECTION

To use an outside water source, you must first switch the selector valve located just above the fill spout. The regulator is located in the water fill and is not adjustable. When the valve is turned so that it is open, the water flows into the tank. Close the valve by turning it in the opposite direction. The selector valve should not be turned while there is water pressure.

Remove the plug from the fill spout and screw on the hose from the water source. The hose should be clean and should be rated "for potable water". Avoid cheap plastic hoses - they often taint the water with a peculiar taste. Once the faucet is turned on, the water system is pressurized without the use of any other pump. The water pressure is regulated to a maximum of approximately 35 PSI pressure. The regulator is located by the water fill.

In some localities the water pressure may be very high. Inquire locally before using the connection. Very high pressure may damage the regulator and the plumbing system.

When you are not connected to the outside water source, the water fill valve must be in the off position, or the water pump will draw air, causing the pump to run constantly with no water delivery. Periodically check the city water tap plug for tightness. This plug protects your water system from particles and contamination and should be immediately replaced if lost. The switch location can be found by referring to the reference chapter in your specific coaches supplement manual.

Note that using the connection does not fill the freshwater tank. The tank must be filled with the selector valve open.

USING WHILE DISCONNECTED

Your coach is not dependent on proximity to a water hose. The system is fully capable of self-contained use for extended periods of time. Two things make this possible: the large freshwater tank, and the automatic water pump.

FILLING THE TANK

Filling the tank requires a pressurized source of potable water. As noted above, always use a clean hose labeled "for potable water", and avoid cheap plastic hoses. Filling the tank may cause siphoning. Attach the hose to the fill valve. Open the selector valve and then turn on the faucet.

The tank has an overflow spill under the fill valve. When water is emerging from this spill, the tank is full. Unhook the hose and replace the plug in the fill spout. Close the selector valve. If the selector valve is left open the water system will be unable to hold pressure. Keep the overflow vent pipes from the water tank free from mud and other debris.

You can monitor the tank level from the panel in the galley. You must turn the panel on to get an LED reading of the water level. This reading can be affected by the slope that the coach is setting at.

Always use clean, potable water. Although the water system does contain filters to prevent damage to the pump and heater, these filters cannot make unpotable water potable. The main filter location can be found in your specific coach owners manual.

THE WATER PUMP

Your coach features an automatic self-priming water pump. It is specifically designed to provide consistent pressure, even at the low volumes common in a motor home. The pump uses 12VDC power.

The pump automatically starts and stops to provide consistent pressure as faucets are opened and closed and appliances are used. The pump is set by the manufacturer to certain settings. Do not attempt to change these settings - doing so will void the pump warranty.

The power switch for the pump can be located by referring to your owners manual. The pump should be turned off when storing the coach and when using a pressurized connection. Keep the pump on throughout your camping trip, unless you are using a pressurized connection.

When the system has not been used for a period of time, air collects in the pipes and prevents the system from pressurizing. The air must be expelled. With the pump on, open every faucet. As the flow through each faucet becomes steady, close them. Allow time for the water heater tank to fill, as well. Don't close the last faucet until the heater is full, and the flow is free of air. The pump should then shut off automatically until you again open a faucet.

If you are going to be away from your coach for a period of time, turn off the pump, then turn it on again when you return. You will not need to prime the pump or perform any other action to restart the system.

TROUBLE SHOOTING

A number of problems can occur to prevent the system from functioning properly. For each problem, a number of possible solutions are offered here.

Problem: The pump does not turn on.

Check the power switch on the monitor panel.

Check the house battery power level, and the availability of 12VDC power.

Check the pump fuse in the 12VDC fuse panel. (See the Electrical chapter in your supplement).

If in cold weather, check whether the pump head is frozen. If so, thaw with a light bulb or other safe heat source.

Problem: Pump runs, but water does not appear.

Check the water level in the tank. Use the monitor in the coach.

Check the valve above the water fill spout. It should be closed.

Check for air leaks near the pump inlet.

Check for a plugged inlet line. Remove the output line from the pump. If no water appears there, the problem is in the inlet. Otherwise the problem is deeper in the output lines.

Problem: Pump runs, but water sputters.

Check the water level in the tank.

Check for an air leak in the input lines to the pump.

Check the in-line filter for evidence of leakage.

Problem: Pump "cycles" - turns rapidly on and off when a faucet is opened.

Nothing is wrong. The pump is designed to cycle in order to maintain even pressure.

Problem: Pump cycles, but all faucets are closed.

Check for leaky faucets.

Check the toilet valve for leakage.

Check the low-point drain valve.

Check the water lines for leaks. Fix any leak promptly, no matter how small.

Place a plug in the output line near the pump, then turn the pump on. It should stop after a few seconds. If not, there is an internal leak in the pump, and it must be replaced.

If the problem cannot be resolved, you can use the pump switch to manually control the system until repairs are possible.

It is suggested that the switch which supplies the power to the water pump be turned off when you plan to be away from the coach for any period of time. When the water supply reaches a low level, the pump will continue to run until the switch is turned off or water is added to the tank. *Refer to the instruction manual furnished with pump for additional information.*

MAINTENANCE

The water system uses ABS water tanks and vinyl tubing, which deliver non-toxic, non-metallic, pleasant tasting drinking water. The system is immune to corrosion and rust. However, to keep your water in drinking condition, the system must be kept pure and clean. Never introduce anything into the system but clean, potable water (except as noted below for cleaning.)

Periodically flush the freshwater tank - as frequently as possible. The tank has a drain valve. (The location of the valve varies. See the table in the supplement.) Fill the tank partially, then open the valve and let it drain. Continue running water into the tank for a time with the drain open. Then close the drain.

At least once per year, flush the tank with a baking soda solution. Fill the tank completely with a solution of baking soda and water, let it sit, then drain the tank. Follow this by flushing the tank with clean water.

The pump and pipes require no maintenance, but they should be periodically inspected for leaks or other problems.

If the tank is not going to be used for a period of time, drain it completely. Never store the coach with water in the tank, always drain the water system completely. Both the tank and the lines need to be drained, as well as the pump and water heater. To drain the lines, open

all the faucets, the shower flow valve, and the low-point drain valve. Give the system plenty of time to drain.

Every appliance which uses water should also be drained before storage. Most appliances can be drained by simply using them. For example, a dishwasher or washer/dryer can simply be operated for a full cycle with the water valves closed. The ice maker can be run until no more ice is formed.

If your coach has a water heater, it must be drained manually. The heater is accessible through an exterior access door. Remove the plug and open the pop-off valve and allow the tank plenty of time to drain.

If it is available, we recommend blowing the lines dry with compressed air. First make sure that all the valves are open, and apply the air pressure to the water fill spout, using an air chuck. Do this twice, with the selector valve both open and closed. Make sure that the air pressure is not over 35 PSI.

COLD WEATHER USE

The entire freshwater system, excluding the tank and lines directly from the tank, is located above the floor and within the insulated walls of your coach. Therefore, with normal use, freezing should not be a factor. However, there are some guidelines that should be followed when using your coach in particularly cold weather.

Since the water lines are hidden in closets and cupboards, make sure that warm air can get to those areas. Keep the doors ajar, and make sure that the air in the coach is circulating adequately. Do not put anything in those cabinet areas that will prevent warm air from reaching the pipes or which will insulate them. Open the sofa kickplate, and keep the interior of the coach warm.

The tank and some plumbing lines are located in the basement which is insulated and can be heated. The basement is heated through either the forced air furnace or the Aqua-Hot hydronic heating system.

TOILET

The toilet in your coach is a self-flushing marine model. It is designed to use as little water as possible, while also flushing cleanly and controlling odors. It differs from a home toilet in several ways, and there some guidelines to follow to get the best results.

The toilet is connected directly to the fresh water system. A valve behind the toilet allows the water supply to be cut off if necessary. Normally the water flow is controlled by the flush lever. Raising the lever allows water to flow into the bowl.

When flushing liquids, the small amount of water released on flushing is generally enough to rinse the bowl. When flushing solid waste, raise the lever and allow enough water to enter the bowl to carry the solids. After flushing, a small amount of water should remain in the bowl.

Pushing the flush lever down opens the ball valve and flushes the toilet. Don't hold the lever down any more than necessary - it wastes water and allows odors to escape from the holding tank.

Generally the toilet is a simple and trouble-free device. But like any toilet, problems sometimes do occur. Some common problems and possible solutions are listed here. *Consult the toilet manual for detailed instructions.*

Problem: Water will not stay in the bowl.

Tighten the clamp ring adjusting nut.

Check the ball valve and underside of the seal for dirt and foreign materials. If necessary, replace seals, flush ball, and half-clamps.

Problem: Water does not shut off after flushing. Toilet overflows.

Disassemble and clean the water valve.

If the valve is defective, replace it.

Bend the front cam strap up approximately 1/16".

If the spring is defective, replace the spring, cam, and plate with a new spring cartridge.

Problem: Water leaks from the water valve.

Tighten the bottom cap, inlet fitting, and outlet hose clamp.

If necessary, replace the water valve.

Problem: Water leaks from bottom of toilet base.

Tighten the toilet mounting bolts.

Replace the rubber seal between floor flange and the base.

Replace the base assembly or floor flange.

Problem: Water leaks from the rear of toilet bowl.

Tighten the hose connections.

Tighten the vacuum breaker-to-bowl connection.

Replace the vacuum breaker assembly.

Replace the toilet bowl

Problem: Foot pedal operates harder than normal or rotating hemisphere sticks.

Apply light film of silicone spray to blade rotating hemisphere.



WARNING: Only items that will dissolve should be disposed of through the holding tanks. Do not flush paper towels, facial tissue, sanitary napkins, or any similar product. Always use soluble toilet tissue, available at RV supply stores

Clean the toilet regularly with a mild bathroom cleaner. Do not use scouring powder or any highly concentrated or acidic cleansers.

These chemicals may damage the seals, as well as the finish of the bowl. Do not dispose of anything through the toilet that might be abrasive, caustic, or corrosive.

SHOWER AND TUB

Regardless of whether you have a shower or a tub/shower combination, the operation is the same. You can use the shower as a fixed shower, by leaving it on its holder. Or you can detach it from the clip and use it as personal hand shower.

On the shower head is a small valve. This is a volume-control valve, not a shut-off valve. Use it to shut off the water flow temporarily, and to control the volume of water you are using. But when the shower is over, shut off the water at the faucet.

To conserve water, preset the water temperature at the faucet. Push the volume control on the shower head off. Then divert the water from the faucet to the shower head. When you are ready to shower, push the volume control on, and use the control as a tool to save water.



WARNING: After the shower, always turn off the water at the faucet.



WARNING: When traveling, keep the drain plug locked.

The tub/shower fixture is a gel-coated fiberglass similar to the type common in many homes. It should be cleaned with a non-abrasive tub and tile cleaner. Do not use scouring powder, as it will damage the surface.

CHAPTER TWO

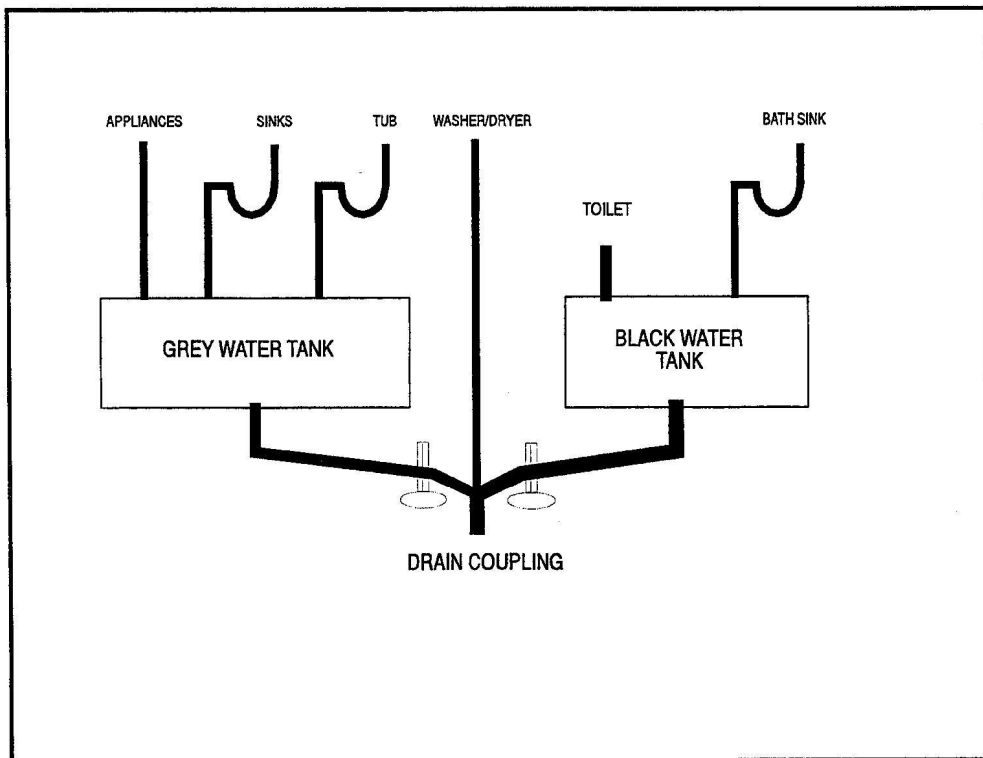
WASTE

GENERAL OVERVIEW

The Waste Holding system in your motor home makes your coach a completely self-contained camping unit. You can use your appliances and fixtures without a sewer hook-up, and store your waste until it is convenient to dump it. The system is designed to be trouble-free and to minimize odors.

The system has two holding tanks - a "black water" tank for toilet waste, and a "grey water" tank for appliances and drains. Both are drained at the same coupling. Your coach also includes a flexible hose and adapter for draining.

The following diagram illustrates the general composition of the system. The actual location of each component varies according to the model of the coach.



Waste System (Generalized)

HOLDING TANKS

The holding tanks in your coach are molded of high-density polyethylene. They are immune to rust and most forms of corrosion, and are designed to last as long as your coach.

The "grey water" tank is used to hold waste water from the galley sink, shower, and appliances. Those drains should not be used to dispose of solid waste, although small amounts of food waste or similar

debris will not harm the system. You should not use the drains to dispose of any caustic or corrosive liquids, as well.



WARNING: Do not dispose of any petroleum product, ammonia, alcohol, or acetone through your drains. Though these liquids will not harm the tank, they may damage valve parts, tank fittings, or drain hoses.

Safari recommends using a grease-cutting soap in your kitchen sink. This will help prevent grease build-up in the grey water tank, and will also help to keep the sensor probes clean. A build-up on the sensor probes will cause the monitor to read improperly.

The "black water", or solid waste tank accepts the output of the toilet and bathroom sink (in most floorplans). It has a larger drain and is located closer to the dump valve, to facilitate dumping solid waste. In order to drain the tank it does need to have a certain amount of liquid in it which is why water from the bathroom sink drains into it. The combination of water and waste will form a slurry which is liquid enough to dump. But never introduce anything into the system which will not dissolve and thus drain.



WARNING: Never dispose of facial tissue or standard toilet paper through your toilet. Facial tissue is treated for "wet strength", and will not dissolve. Toilet paper is often dyed, embossed, and/or perfumed, which hampers dissolution. Always use soluble RV tissue, available at RV supply stores.

The tank levels can be monitored from the monitor inside the coach. Check the levels frequently - an overflowing tank can be an unpleasant experience. The monitor readings can be thrown off by the chemical contents of the tanks, as well as from movement or not being level.

ODOR CONTROL

Naturally, odor can be a problem with your tanks. To keep odors under control, clean your tanks regularly, and use chemical deodorizers.

Before each trip, and after dumping, add approximately one gallon of water to your black water tank through the toilet. Then flush a chemical package or liquid tank deodorant into the tank. These products are available at any RV supply store. The water helps liquefy the solids and reduces odor build-up.

After every trip, clean the tanks. The grey water tank generally requires only an occasional rinsing. If an odor develops in the grey water system, fill the tank with a solution of water and baking soda. Let the solution sit, then drain it.

The black tank requires more attention. To aid in cleaning the black tank, most coaches have been equipped with a black tank flush system. Each time your tanks are dumped, flush the black tank for three to five minutes with the holding tank valves open. *See the instructions for the flush system for more detailed information.* After every trip, fill the tank with clean water and drive the coach for several miles. The driving agitates the water and helps dissolve the remaining solids. Then drain the tank.

If your tanks or plumbing lines ever sustain damage, take your motorhome to a reputable service center. There are ways of repairing tanks and lines that do not require removing the tanks from the coach.

SEWER CONNECTION

The tanks are drained through a single fitting located below the service center. The operation requires a flex hose, which is supplied with your coach. When the hose is not in place, the drain coupling should be covered by a cap.

There are many publications that list dumping stations where you can empty your tanks. Most state and commercial campgrounds have a dumping station, as do many service stations.

DRAINING THE TANKS

To drain the tanks, first remove the coupling seal cap from the drain fitting. Then attach the flex hose to the drain - insert the hose adapter into the coupling and twist it to lock it into place. Attach the other end of the hose to the sewer line. Then drain the tanks - first the black, then the grey. Each tank is drained through a quick-opening knife valve.



WARNING: Never empty either holding tank directly on the ground. Not only is this practice illegal, it is the worst possible way to win friends in the recreational community.

When your dumping is complete, make sure both valves are closed. Always keep the coupling seal tightly fastened.

USING A SEWER LINE

When you are parked at a campground with sewer facilities, you can keep the system hooked up to the sewer continuously. Although you can keep the hose in place, you should still keep the valves closed. Dump the tanks every few days, when a substantial amount of waste has accumulated.

After several days have passed, and the black tank has enough waste to flush through, open the knife-valve and dump the black tank. Then close the valve and follow with the grey tank.

If you have a washer/dryer installed in your coach, there is a third outlet to the drain coupling. The washer/dryer does not drain into either tank. Instead, its waste water flows directly to the sewer coupling. Therefore, you must be hooked up to a sewer line to use this appliance.



WARNING: Do not attempt to use the washer/dryer without being hooked up to a sewer line.

CHAPTER THREE

LP GAS

LIQUID PETROLEUM GAS

Liquid Petroleum Gas, or "LPG", is an extremely clean and efficient fuel. With proper handling, it is safe, economical, and provides modern living conveniences no matter where you travel. It is close to non-polluting, and packs a tremendous amount of energy in a small container. It is an ideal fuel for RV appliances - it is often used in cooking, heating, generation and refrigeration.

LP gas is a colorless, odorless gas. For storage it is compressed until it becomes a liquid. It can be purchased at many service stations and from dealers in residential fuels. It is comparatively inexpensive and easy to find. It is not the same as natural gas, and natural gas should never be used as a substitute.

Since LP gas is normally odorless and invisible, a chemical is added to give it a distinctive garlic-like smell. Learn this odor and make sure every person staying in the coach is familiar with it.

LP gas is heavier than air. Thus, if it is released into the atmosphere it will settle to the ground. In a closed area it can linger for hours, rather than dissipate. It burns readily and yields a great deal of energy. The improper use and handling of LP gas always presents a hazard.



WARNING: Avoid inhaling LP Gas. LP Gas is potentially lethal and flammable.



WARNING: If you smell LP gas, do not strike a match or start a flame. Ventilate the area thoroughly, until no odor remains. Identify the source of the gas as quickly as possible.



WARNING: Never store LP gas containers inside your coach or in any storage compartment. All such containers have pressure-relief valves which may release gas into the atmosphere. Keep the container away from open flames at all times.

LP gas is stored as a pressurized liquid in your tank. This pressure ranges from 40-200 lbs per square inch, depending on external temperature. Before it can be used as a fuel it has to return to its gaseous state. In your coach, special valve systems called *regulators* serve to supply gaseous fuel to the appliances, while the tank supply remains a compressed liquid. The regulator reduces the pressure to less than one pound. When the liquid gas hits the atmosphere, it expands to many times its original volume and turns into a gas vapor. This vapor is used for cooking, heating, and refrigerating goods.

Not all LP Gas is the same. There are two main components of LP Gas, propane and butane, and they can be blended in any proportion. Butane is the less volatile, and cannot be used in temperatures below freezing. Propane can be used in temperature well below zero degrees Fahrenheit. If you plan on camping in cold weather, be sure to use gas containing a high proportion of propane.

SAFETY PRECAUTIONS

If LP gas is mishandled, or if the system is not maintained properly, the results can be disastrous. Always follow the safety precautions listed here, and keep your system in perfect working order.

Problem: If you smell the garlic-like odor of LP gas in your coach, immediately do the following:

Open all windows.

Don't touch any electrical switches, even for the fan.

Extinguish any open flames.

Turn off the vapor valves on the LPG tank.

*Leave the coach. Do not return until the gas has dissipated.
Remember that the gas will linger near the ground.*

Call a service center, dealer, or gas supplier. Have the system checked and the leak corrected before using again.

Periodically have the LPG supplier check the system for possible leakage, missing or damaged parts.

If the odor is outside the coach, most of the same procedures apply. Shut off the gas supply at the tank and get assistance.

Whenever using the gas range, turn on the exhaust fan or open the overhead vent to allow fumes to escape, and open nearby windows. Never use portable cooking equipment, such as wood or charcoal grills

or gas camping stoves, in your coach. Such equipment is a fire hazard, and can silently cause asphyxiation.

Never store LP gas inside your coach or in a storage compartment. All such tanks have a pressure-relief valve that may release gas into the atmosphere. Such tanks should be kept only in well vented areas and only be used by the person filling the tank.

Do not tamper with the LP Gas system, pressure regulators or appliances. Check with the factory before drilling holes or attaching objects to walls or floors as gas lines may be seriously damaged. Any repairs, alterations, modifications, or additions should be done by a qualified technician. Whenever the piping has been opened, it must be checked for leaks. Periodically have the LP Gas supplier check the system for possible leakage, missing or damaged parts. Practice safety at all times. If you have questions about the operation of your appliances or LP Gas system, contact your local LP gas dealer or RV service center.

THE LP GAS TANK

The LP Gas tank is located in a vented compartment. It has four valves - a fill valve, a pressure-relief valve, and two vapor valves. It also has a gauge which indicates the current amount of fuel in the tank. The fill and pressure-relief valves are used only when filling the tank, and should not be handled any other time. The vapor valves control the supply of gas to the appliances.

Before filling the tank, make sure that all pilot lights are off, and that the engine and generator are not running. The vehicle should be level. The technician filling your tank should be trained in the full procedure. It is essential that the tank not be overfilled. To allow for heat expansion, the tank should only be filled to 80% of its capacity. The relief valve should prevent filling beyond that point.

A tank that is overfilled can cause system freeze-ups, uncontrolled gas flow, and possibly fire or explosion. Despite the several safeguards,

ultimately it is your responsibility to make sure that the tank is not filled past the 80% level.

The main valve should be closed after filling. Even if the tank is empty it should be kept closed to prevent moisture from entering the tank.

The vapor valves control the flow of gas to the appliances. A regulator is mounted on each one. One valve controls the flow to the generator, and thus is absent from coaches with diesel powered generators. The other valve controls the flow to the rest of the appliances. These should be closed when filling the tank. They should also be closed when the appliances are not going to be used for an extended period of time to prevent moisture from collecting inside.

When opening the vapor valves, always follow this procedure: slowly open the valve until vapor fills the line. Open completely, then close it one-quarter turn. There is an excess flow check valve which stops the flow if you open the valve too quickly. By closing the valve slightly, it is easier to tell whether the valve is open or closed.

If only a small amount of gas flows into the line, close the valve completely and try the procedure again.

Never use a wrench or pliers on any of these valves. They are designed to close completely by hand. If tools are necessary to stop the flow, the valve needs to be repaired or replaced.

Do not replace the tank furnished with your unit without first checking with the factory.

REGULATORS

The regulators control the flow of gaseous fuel to the appliances. They are mounted by the vapor valves on the tank. You should inspect them every time the tank is filled.

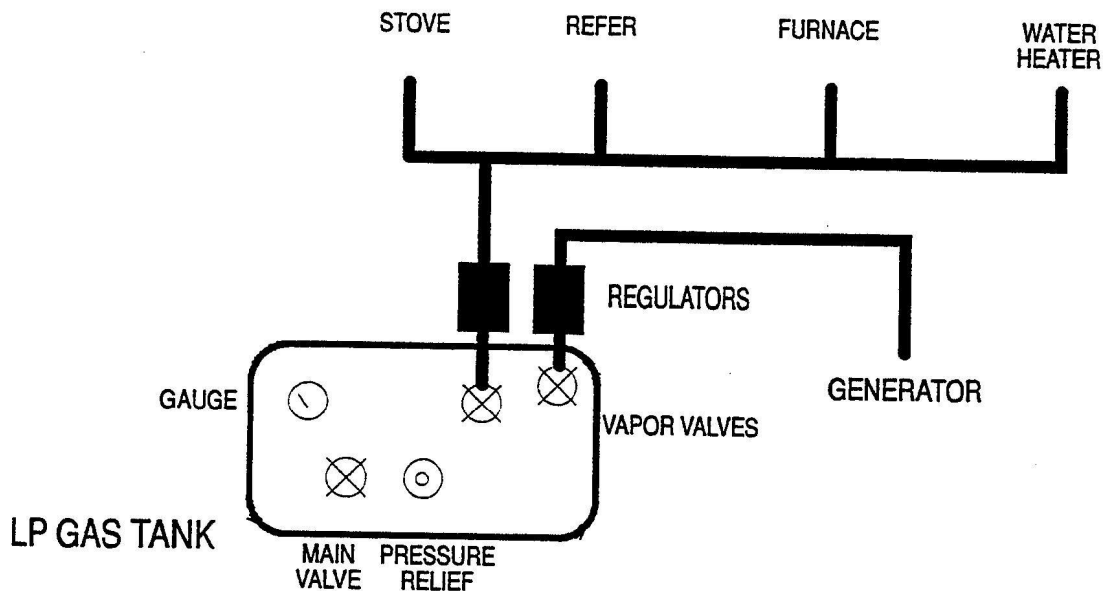
Each regulator has a protective cover. Make sure that the cover is in place and that the regulator vent is not blocked. The regulator vent should face downward, and should be free of mud, ice, insects, or other debris.



WARNING: Only trained service personnel should install or service this equipment. Replacement equipment must meet specifications set by the factory. Consult with the Service and Warranty department before installing new equipment.

Moisture in the system can cause the regulators to "freeze up" and block the gas flow. Therefore it is imperative that moisture never be allowed to enter the system, even in minute quantities. If moisture does enter the tank, the system must be purged.

Other problems can cause the flow to cease, as well. Overfilling the tank will cause liquid fuel to pass through the regulator. The pressure will become irregular and the appliances will function improperly or not at all. It can also cause the regulator and gas lines to become frosty.



Liquid Petroleum Gas System (Generalized)

MAINTENANCE AND TROUBLE SHOOTING

Proper maintenance is essential for the safe operation of your system. Do not allow the system to fall into disrepair.

LP Gas is not corrosive, so you generally don't need to worry about the inside of your tank and gas lines. However, the exterior of these should be maintained. The tank should be protected from rust by a periodic application of good paint.

Inspect the lines and fittings regularly for signs of corrosion. Periodically they should be checked for leaks. To check a fitting, apply very soapy water and look for bubbles. Do not use any product with ammonia, chlorine, or other corrosive or caustic chemical. Do not check for leaks with a match.

Many common problems have simple solutions. Some of these are listed below. If the advice in this manual is not enough to solve your problem, take your coach to a service center, dealer, or fuel supplier with trained personnel. The LP gas system should only be worked on by trained technicians.

Practice safety at all times. If you have questions about the operation of your appliances or LPG system, contact your local LP Gas dealer or RV service center.

Problem: Gas does not seem to reach appliances. Generator will not run, pilot lights will not light.

Check the gas level in the tank.

Check to make sure that the vapor valves are open. Close them and open again, following the procedure above.

Check for debris or corrosion on the regulators. If any is apparent, take the coach to a service center for repair.

The problem may require a trained technician. Moisture in the tank may have "frozen" the regulator, and requires purging. Take your coach to a service center.

Problem: Gas bleeds out of the pressure relief valve.

Check the tank level. If it is over 80%, then the valve is operating correctly. If not, allow the gas to dissipate and take your coach to a service center.

Problem: Gas flow is very slight.

Close the vapor valve and slowly reopen. The excess flow check valve constricts gas flow if it is opened too quickly.

In very cold weather the gas does not vaporize as quickly, so the flow is diminished. Do not use butane gas in cold weather and keep the tank as full as possible.

Problem: Gas flow is inconsistent.

Check the tank level. An overfilled tank will cause this problem.

Check for debris or corrosion on the regulators. If any is apparent, take the coach to a service center for repair.

Take your system to a service center. Moisture or a faulty regulator can cause this problem.



WARNING: Do not attempt repairs on your own. All repairs require a trained technician.

CHAPTER FOUR

APPLIANCES AND EQUIPMENT

SCOPE OF THIS MANUAL

Your motorhome contains a variety of appliances and gadgets, ranging from the microwave oven to the awnings. We've included the manufacturer's manual for each of these in the warranty package. This manual can't possibly duplicate the information contained in all of these books and pamphlets, but for your convenience it contains some general information to help you begin using your appliances as quickly as possible. If you can't find the information you need in these pages, consult the manufacturer's manual.

The information in this chapter is generalized, and your coach may differ in some specifics. Your coach may contain optional equipment, or may have slightly different appliances because of limitations of the floor plan, chassis, or model. Again, consult the manuals in your warranty pack for specific information on your appliances.

KITCHEN APPLIANCES

Your galley contains a full suite of appliances. Every coach has a range, microwave/convection oven, and refrigerator, and some coaches may have a dishwasher, washer/dryer or ice maker. Although the appliances are all very similar to models found in homes, there are some things to consider when using them on the road.

Unless you are camping with full hookups - sewer, water, and electricity - your coach is limited by its capacity to store and provide power and water, and its ability to store waste. Keep an eye on all of these resources - use the monitor panel to observe their status, and check the LP Gas tank regularly. There are few frustrations to match cooking with a full sewer tank or an empty LP Gas tank!

SINKS

Your kitchen features either a deep stainless steel double sink or a Fountainhead sink. Fountainhead is covered in the following section. To keep your stainless steel sink in sparkling condition, you should follow this advice:

After each use, rinse and wipe the sink dry.

Never use steel wool. The steel particles left in the sink can rust and become unsightly.

Clean the sink with a mild cleanser. Rub the sink along the grain of the metal. Do not use abrasive, caustic, or corrosive cleansers.

The manufacturer recommends not using a rubber mat in the sink. These mats can cause cleaning problems.

FOUNTAINHEAD COUNTERTOPS AND SINKS

Fountainhead surfaces are nonporous so they can be easily cleaned with a damp cloth and ordinary soap or household ammoniated liquid detergents. Fountainhead not only looks great but it is very easy to care for. Minor scratches and scrapes can be repaired by buffing lightly with no appreciable change in surface appearance. Following these tips will keep your Fountainhead countertops in great condition for years to come.

After use wipe off all countertops.

Use non-abrasive cleaners, ones that won't be caustic or corrosive.

Do not put hot pots or pans directly on the countertop.

Scratches can easily be buffed out. Buffing materials can be purchased in home centers and cabinet supply shops.

RANGE TOP

Before attempting to light or operate your range, please *refer to the manufacturer's instruction and warranty manual for more specific information related to your range.*

Your motor home is equipped with an LP gas range. Before using the range, acquaint yourself with the safety precautions described in the LP Gas chapter. LP Gas has a distinctive garlic-like odor. If you smell gas in your coach, immediately follow the procedure listed in the LP Gas Safety Precautions part of the manual.



Warning: *Do not use the range without switching on the ceiling exhaust fan. To ensure against possible ignition of clothing or any other combustible materials, the user should always adjust the top burner flame size so that it does not exceed beyond the edge of the cooking utensil. Extremely flammable liquids or materials should not be stored in cabinet areas around the cooking appliance.*



Warning: *A gas range is not and should never be used as a space heater.*



Warning: *Do not leave the burners or pilot lights lit while traveling or refueling your vehicle at a service station.*

Your range should be cleaned with a mild cleanser. Never use abrasive or corrosive chemicals on your range. If you spill or spatter on the stainless steel, clean it promptly or the metal will become discolored and difficult to remove. If any orifices become stopped up, clean them with a toothpick and lighter fluid, when the burners are shut off. Do not use metal instruments as they may distort or enlarge the orifices.

Gaggenau Rangetop

This appliance is designed for one hand operation. Ignition is achieved by pressing the control knob. For specific information on how to operate and care for your rangetop, *refer to the Gaggenau operations manual.*

The burners have a thermo-electric ignition safety device to prevent unburned gas from escaping. The top cover must be open when the main burner is in operation.

To switch a burner on, depress the knob and turn counter clockwise to the high setting. The burner should ignite automatically. Keep the switch pressed in for 5-10 seconds after lighting to ensure that the safety ignition procedure is completed. If the unit fails to stay lit, repeat the procedure using longer time. Wait 5 minutes before lighting again.

Adjust the size of the flame required by rotating the knob. To switch the burner off, turn the knob to the off position

All burners spark simultaneously whenever any knob is depressed. The burners may be ignited by household matches. If the burner does not ignite within 2-4 seconds turn the knob to maximum until ignition. Afterwards, adjust the size of the flame.

If the appliance does not operate correctly, check the breakers, and the gas supply first. Then call your nearest Gaggenau service center.

Seaward Rangetop

Each LPG Cylinder has a manually operated shut-off valve threaded directly into the cylinder outlet. A readily accessible shut-off valve should have been installed in the low or high pressure supply line to each appliance. The burners have a safety device to prevent unburned gas from escaping.

It is recommended that every time the LPG tank valve is opened for use, that you close the valve and watch that the needle remains constant. If the needle does not remain, a leak may have occurred. Make sure that the system is fixed before operation. Do not operate the appliance if it is leaking.

To light the burners push in the knob and turn it counterclock-wise to the ignite position. Hold the knob in until the spark ignites the gas and until the thermocouple is heated (5-10 seconds). This will activate the safety magnet and keep the burner lit. Release the knob and set to the desired setting. Turn the knob clockwise to turn it off. Then close the LPG tank valve.

Regular cleaning with a soft cloth and a warm detergent solution is generally enough to keep the top of your rangetop clean and beautiful. This is done when the rangetop has cooled. Use a dry cloth or paper towel to clean splatters and spills when the surfaces are barely warm.

For more information on your Seaward rangetop please refer to your Seaward manual.

REFRIGERATOR

Before attempting to operate the refrigerator in your motor coach, *please refer to the instruction and warranty manual* which you will find in the warranty pack.

Your refrigerator is capable of running on either 120VAC power or LP gas. You can manually set it to run LP gas or put it in an automatic mode. In the automatic mode, it will run under 120VAC. If the AC power is unavailable, it automatically switches to LP gas. Each mode has its advantages. But generally, if you are connected to a "land-line", using AC power will save your LP gas for other purposes. If you aren't connected to an outside power source, LP gas is more efficient.

The refrigerator is controlled by three switches. One switch controls the thermostat, another the humidity, and a third controls the mode of operation. When starting the refrigerator, the thermostat should be set to "coldest". After starting it can be moved up to the desired setting.

The humidity switch allows you to control condensation on the unit. If water droplets appear on the refrigerator between the door panels, the switch should be moved to "high humidity". Otherwise it should be kept at "normal". The "storage" setting cuts off all DC power to the unit - shutting off the light and panel indicators. This allows you to leave the door open without draining the house batteries.

The mode switch is the main power switch. Next to the switch is a monitor which indicates the unit's current power source - AC or LP gas. An "X" on this panel indicates that the unit is attempting to use LP gas, but the burner is not lit. When operating on the "LP Gas" mode, be aware that the unit is also drawing a small amount of 12 VAC power from your house batteries.

To start the refrigerator first turn the thermostat to its coldest setting. Then push the mode switch to "gas". The red X will appear for several seconds. The X should disappear within ten seconds, but if there is air in the gas lines it may take up to twenty seconds. If the X is still displayed after twenty seconds, turn the switch off and try again.

If the burner does not light after several tries, let the unit sit for several minutes. Gas may have built up in the unit, presenting a hazard. See the chapter of this manual on LP Gas for reasons the gas system may malfunction.

If you have trouble with gas operations, check to make sure that the main supply has been turned on and that the valve on the refrigerator is in the on position.

If the system has not been used for some time or if the supply tanks have just been refilled, air may be trapped in the LP Gas supply line. To purge this air from the lines may require resetting the on/off switch three or four times with only the gas button pushed.

To use the system in automatic mode, push the switch to "auto". If power is not available, it will automatically attempt to use the LP gas, following the same procedure. The AC power must come from either a land line or the generator - the cooling system will not draw from the batteries.

Keep your refrigerator clean, using mild soap. The freezer will accumulate frost, and should be defrosted occasionally. Odors can be controlled through the use of baking soda.

You should check the condition of the burner regularly, even if you rarely use the gas mode. Full instructions are given in the manual.



WARNING: Do not store anything in the refrigerator vent / access area. Restricted air flow may damage components and void the warranty.



WARNING: Do not store volatile substances in the refrigerator, such as lighter fluid, gasoline, ether, or other substances.

MICRO/CONVECTION OVEN

The oven in your coach combines the power and convenience of microwaves and convection ovens. It acts as an 800W microwave oven, or a 1350W conventional electric oven. It operates on 110volt or 120VAC power sources; such as the shoreline, gen-set, and the inverter, if you have a Freedom 20 inverter.

The details of the oven operation are beyond the scope of this manual. A full manual is included in the warranty package. Be sure to read all of the instructions and precautions supplied with the oven before using it. The manual also contains an excellent summary guide.

A properly functioning microwave oven presents no hazard with ordinary use. The oven has safety interlocks to prevent its use with the door open, and screens to prevent microwave leakage. These safety features should be kept in good condition - never attempt to bypass the safety interlocks or allow debris or residue to accumulate on the door or oven face. If the oven is damaged, do not attempt to use it.

The oven should only be adjusted or repaired by qualified service personnel. Check your owners manual for maintenance tips and other information. Be sure to register your oven with the manufacturer.

HEATING AND COOLING

Your coach contains several systems to maintain a comfortable living temperature, including powerful furnace and air conditioning units. However, don't underestimate the importance of the simplest systems - windows, vents, and fans. Proper circulation is crucial to maintaining a comfortable environment.

Heat is not the only factor affecting your comfort. Humidity is just as important. Furthermore, humidity causes condensation, and condensation can damage your coach. Bathing, cooking, and even

breathing all increase the moisture in the atmosphere. That moisture must be expelled through windows and vents.

Therefore, even when you are running the furnace or air conditioning, you should keep some vents and windows open. Run the fans when cooking or bathing, and any time the humidity starts to rise.

FURNACE

For specific information related to this appliance, please read the instruction manual before attempting to operate. Failure to follow the instructions may result in damage to the unit.

The furnace utilizes LP gas to generate the heat to warm your coach. A fan distributes the heat. The air is drawn into the furnace, heated, then ducted to all parts of the coach. A thermostat controls the furnace operation - the unit is completely automatic.

To start the furnace, first turn the thermostat to a temperature above the current room temperature. The blower will come on, purging the furnace. Let the blower run for approximately five minutes, then turn the thermostat down to below room temperature. After about two minutes the blower will stop.

Now set the thermostat to the temperature you desire. The blower will come on. The burner should light within thirty seconds. If the burner doesn't come on, shut off the gas and repeat the purging process.

After this initial process, the furnace will operate automatically. You can control the temperature using the thermostat. To shut the furnace off, set the thermostat to the "off" position. Keep the control compartment clean at all times. Periodically check the vents and never let them become clogged with accumulated road dust, weeds, or tar. Avoid spraying water into the vents when washing the vehicle. Do not obstruct the vented furnace access door.

Make sure you are familiar with the safety guidelines for all LP gas appliances before using the furnace. *Read through your owners manual before operating your furnace.*

ROOF AIR CONDITIONING

The air conditioning system is AC powered and thermostatically controlled. In addition to its cooling power, you can also use it as a forceful circulation fan. The airflow is ducted through registers on the ceiling.

The system requires little maintenance. Two filters protect the cooling coils from debris, and these filters should be changed regularly. Simply remove the shroud on the bottom of the intake vents, exchange the filters and replace the shroud. Do not run the unit for any length of time without filters.

When operating the air conditioners at night, remember that the outside temperature may drop during the night as well. If the outside temperature drops far enough while the unit is still running, the cooling coils can become choked with ice. During the night, set the thermostat to a moderate temperature between warm and cool. If the unit ices up, turn it off and allow the ice to melt before using it again.

DASH HEATER AND AIR CONDITIONING

The dash of your motor home contains automobile-style heater and air conditioning units. These are designed to keep the front cab area comfortable while driving, without using the main appliances. They are intended to reduce the reliance on the main appliances, and to utilize the extra heat and power your engine produces.

ATTIC FAN

The smallest, most innocuous appliance in your coach is also one of the most important for keeping your coach comfortable. Powered by the 12VAC house batteries, the attic fan is essential for controlling humidity and odors, as well as temperature. Properly used, it can reduce your reliance on the larger appliances, and save considerable energy in the process.

You should always run the attic fan while cooking or bathing, and at night, to control odors and humidity. You should also run it while the furnace is on, to control moisture. The fan uses much less power than the air conditioner, and thus should be used preferentially to cool the coach. In addition, it can boost the effectiveness of your A/C unit by removing warm air from the ceiling.

You should also use the attic fan when you are in cold weather. With cold weather usage, the coach is likely to be closed up, causing moisture to build up. Humidity can be a coach's worst enemy - it is very important to keep the humidity level low.

ENTERTAINMENT

Your coach contains a variety of gadgets provided for your entertainment. We install the same kinds of video and audio equipment that are found in many homes, therefore the basic operating principles should be familiar to almost everyone. The manuals for all of this equipment are contained in the same package as this manual. A full discussion of this equipment is beyond the scope of this book. *Please refer to the individual manuals.*

TELEVISION

Your televisions are equipped to use either an antenna or a cable hookup. Broadcast signals are picked up using a power-booster antenna,

while the cable hookup is located in the service center on the driver side of the coach. An adapter provided with your coach allows either a coaxial cable or a two-conductor wire to be attached.

If you are using the antenna, and would like to improve the picture, there is a power boost available. To use the power-boosted crank-up antenna, you must turn on the boost switch. The boost draws 12VDC power to amplify the antenna signal. It is controlled from a small switch in the cabinetry in the front of the coach. Since this does draw a small amount of house battery power, remember to turn it off when not in use.

If you are using the cable hookup, you must leave the boost switch in the off position.

Remember after using the TV antenna to lower it before driving.

For instructions on using the television, check the manual included in the package.

VCR

Your coach may be equipped with a VCR. *Please refer to the owner's manual for specific instructions on running the VCR.* Your VCR includes such features as auto daylight savings time, auto operation functions, and one touch mechanisms.

Before you begin using your VCR, make sure all connections are made and that the TV and VCR are plugged in. Check to see that the TV is turned on and set to the VCR channel that you set on the back of the VCR. Next make sure that the VCR is turned on.

MISCELLANEOUS APPLIANCES

In addition to all of the equipment described above, your coach contains other appliances which fit in no particular category, and are listed here.

WATER HEATER

Your water heater uses LP gas to provide the energy to heat your water. It does not use a pilot light. Like the furnace, it has an electronic ignition, which uses a small amount of 12VDC power. The entry step electrical switch must be turned on.

Before starting the water heater on either source, fill the unit completely with water and open the hot water tap in any location and allow the water to flow freely for a few minutes to remove any trapped air. The LP Gas unit has two controls - an on-off switch and a reset button. The heater has an internal thermostat which is not adjustable. It also has a safety cutoff. If the heat in the unit exceeds 180 degrees, it automatically shuts off, and will not start again until it has cooled down and the reset button is pressed.



WARNING: The heater must never be started without a full tank of water. Make sure the water pump is on and no longer pumping before starting the heater.

Starting the tank is nearly automatic. After turning the switch on, there will be a 15 second purging cycle, after which the burner should light. The heater will automatically try three times before quitting. If it does not start after approximately one minute, turn the heater off, then on again. Several attempts may be necessary if there is air in the gas lines.

If water is left in the hot water heater during periods of storage, hydrogen gases may build-up in the tank. It is important to relieve the gases before use. To do this, open a hot water faucet and allow the water to run long enough to clear the air out of the tank. Be cautious when

doing this, hydrogen is explosive - extinguish all open flames before beginning this process. Also, do not use the washer/dryer before clearing the tank, if hydrogen gas builds up in the drum, it can cause an explosion.



WARNING: If water has been in the hot water heater during periods of storage, run the hot water to clear the tank of a possible build-up of hydrogen gas. This gas can cause an explosion if it comes in contact with a spark.

The heater manual contains more information, including trouble shooting instructions.

LEVELERS

Refer to your operations manual before operating the leveling system on your coach. Beaver installs a three-point hydraulic leveling system. The hydraulic system is designed to be easy to operate, quick, reliable, and of course, stable.

Do not use the leveling system for changing tires or working under the vehicle without securely blocking the frame and wheels. If a rear wheel is lifted from the ground, there is a possibility that the vehicle may move either toward the front or the rear.

Keep all persons away from the leveling system mechanism when operating the leveling system, driving the vehicle, and/or when the vehicle is parked. *Before using the leveling system, it is important to read the entire section in your operator's manual for the levelers.* Make sure levelers are locked in the up position before driving.

The leveling system should be cycled at least once a month or whenever the coach is used to keep the system in operating condition.

The levelers operate hydraulically, with the power coming from a 12VDC hydraulic pump. To operate the jacks, the pump must be turned on. Each jack is controlled by a separate switch.

Before starting, always block the tires. You may want to keep the engine running while leveling to keep the engine batteries fully charged. Always extend the rear jacks first, and level the coach side-to-side. Then extend the front jack to level the coach lengthwise.



WARNING: Do not attempt to use the jacks on unstable ground. Do not stack objects under the jacks. Do not raise the tires off of the ground. If the ground is too uneven for the jacks to level the coach, the coach should be moved.

Before retracting the levelers, clean any dirt off of the jack cylinders.

Retract the front jack first, then the rear jacks. After retracting the front jack, retract the two rear jacks at the same time. This will provide a smooth retraction. Always inspect the jacks before driving and unblock the tires. Do not move the vehicle while the leveling units are still in contact with the ground or in the extended position. Moving the unit with the leveling jacks extended can cause severe damage to the jacks and/or the coach.



WARNING: Do not rely on the warning lights. It is the operator's responsibility to visually check that all jacks are fully retracted. (Also make sure that the leveling units are in the retracted position before checking the hydraulic oil reservoir.)

In general to ensure the smooth operation of the leveling system, it is a good idea to occasionally check the individual leveling units to prevent problems. This is especially true under the following conditions:

If driving conditions are unusually muddy, the units can become clogged or caked with mud. This condition can hamper the proper operation of the leveling system. This problem may be prevented or remedied by cleaning off each unit.

In wet, icy weather the units can become encrusted with ice. This may cause the leveling system to function improperly. To eliminate this

problem, periodically check each unit and break loose any accumulation of ice which hinders proper operation.

Depending on the model of your coach, the leveler control panel contains indicator lights in addition to the switches mentioned here. Familiarize yourself with the meaning of these lights before using the jacks. A full explanation is included in the leveler manuals in the warranty package.



WARNING: Always physically inspect the jacks before driving the coach.

SLIDE-OUT

The slide-out is controlled by a single switch. Before extending, level the coach, and slide the driver's seat completely forward. Then, to operate the slide-out, you must first unlock the system by turning the key to the "on" position, this lock will be located either above the entry door or above the refrigerator depending on the floorplan. It is a good idea to keep the system locked when not in use, especially if children are aboard.



WARNING: Before opening the slide-out, always physically inspect the outside area to be sure that it is clear.

After unlocking the system, simply push the slide-out switch to the "open" position. The slide-out will make a whining sound as it extends, then it will stop when it is fully extended. To be sure that it is fully sealed, check the seal behind the wooden panel which is located at the end of the slide box, behind the driver's seat.



WARNING: If the slide-out box is not fully extended or retracted it is not sealed.



WARNING: Never drive the coach with the slide-out extended.

To retract the slide-out, again unlock the system, then push the switch to the “close” position. To be sure there is a good seal, check the seal outside of the coach along the seams of the slide box.

In case of a failure in the system, there is a manual means of operating the slide-out. There is a gear head located at the base of the front-most chassis outrigger under the slide box. This gear head can be operated with a 1” ratchet wrench. Since the hydraulic system maintains the extension and retraction of the slide-out, the hydraulic line will most likely need to be disconnected before manual operation can be successful.

The slide-out mechanism is on the same hydraulic system as the leveling jacks, they share the same pump and hydraulic fluid reservoir. The slide-out operates on a rack & pinion based system and slides on a sealed bearing system. Depending on the model, however, there may be a pinion support bearing at the rear of the slide box that will periodically need to be greased. The amount of use will determine the number of times that it will need to be greased - probably one to three times per year.

By design, the slide-out requires very little maintenance. Besides the greasing of the support bearing, you need to inspect seals periodically and rinse the top of the slide-out roof to clean off any debris.

ELECTRIC STEP

The electric step is controlled both by a sensor on the door and by an on/off switch near the doorway. The on/off switch controls the 12VDC power to the step. If the switch is on, then the step will extend and retract when the door is opened and closed. If the switch is off, the step will not move. Therefore, to lock the step in its extended position, turn the step on, open the door, allow the step to extend, then turn the switch off.

Check your individual coach manual to for additional features of the electric entry step. Some feature an automatic courtesy light and safety features that help to prevent damage to the step or motor. *Read your manual for further instruction on how to operate the step.*

The step mechanism does require regular lubrication and it must be kept clean.



WARNING: Always make sure the step is retracted before moving the coach.

REAR CAMERA AND MONITOR

The rear back-up monitor is located in the dash console. Turn it on and adjust it in order to get a clear image. *See the instruction manual for complete information.*

AWNINGS

Awnings are standard on many Beaver products, and are a popular option on other models. Properly used, awnings are much more than an attractive window dressing. In warm weather they are vital for keeping your coach cool and comfortable.

Awnings can have a profound effect on the temperature of your motorhome. In hot, sunny weather they can greatly reduce the need for air conditioning. Instead of running the roof airs, extend all awnings fully, open the door, and use the attic fan to expel the warm air. In many conditions this will be more comfortable than air conditioning. Remember that it is much easier to keep a coach cool than it is to cool a coach down.

The awning manual in your warranty pack contains detailed instructions for the use of your awning, including maintenance, troubleshooting, and warranty information. Read this document before using your awning.

Carefree Awnings

To extend an awning you must first release the several locks. On each awning arm is a locking mechanism controlled by a plastic knob, and on the right end of the awning there is a small lever which locks and unlocks the awning roller. Release the arm locks, then loop the rod over the roller lever and pull it down.

In the center of the awning there is a strap. Hook this strap with the awning rod and pull gently and evenly, extending the awning to whatever length you need, but at least half of its full length.

There is a brace on each arm which secures the awning in position. Slide these to the tops of each arm and tighten the locking knobs. Then extend the arms to your desired height - at least high enough to clear the top of the door. The arms of the large patio awning can be released from the side of the coach and placed on the ground for a carport effect. Stakes should be driven into the ground through the bottom of the arms to secure the awning.

Retracting the awning requires reversing the above steps. However, the awning will not retract until the roller lever is pushed back into the closed position. Pull down slightly on the awning while moving this lever into place. Keep a firm hold on the pull strap, because engaging the lever brings the full spring force to bear on the awning. Make sure that all the locks are engaged before moving the coach.

Maintenance

If you anticipate rain, the larger awnings should be set up slightly slanted - one arm lower than the other - to shed water. Don't use the awnings in windy weather - a strong gusty wind can destroy the awnings and damage your coach. The awnings must be raised high enough to clear the open door of the motorhome in order to prevent damage to the canopy.

The beautiful fabric of your awning is made of acrylic fibers which cannot rot or mildew. Your awning can be rolled up wet if necessary, but be sure to open it and dry it as soon as possible.

The acrylic fabric of your awning is a synthetic and cannot support mildew or other plant growth. However, mildew can find a home on any pollen, grain dust, plant spores, or other airborne plant material that may accumulate on the awning. If mildew forms on any of these elements, it can leave a stain which can be unsightly and difficult to remove, even though it will not weaken the fabric itself. To minimize the chance of a stain, keep your awning as clean as possible by hosing it down frequently. Awning fabric can be punctured or torn by sharp edges that scrape or rub against it.

Washing your awnings will help keep them in great condition so they will last through the years that you own your coach. On a monthly basis, loosen hardened dirt and dust with a medium bristled brush and then thoroughly rinse both the top and bottom with a hose. Wash both sides of the awning with a mild solution, scrubbing with the brush. Rinse thoroughly. If water drips through the needle holes in the stitching, you can use a commercial seam sealer available in canvas and trailer supply stores. The holes will however, usually seal themselves.

Never use a strong detergent or stain remover on your awning. These can destroy the water repellent properties of the fabric.

Although your awning is designed for low maintenance, a few precautions will keep the metal parts in top shape. The casings are bright-anodized aluminum and they should be cleaned once a year with a high grade, non-abrasive chrome or aluminum polish. The main arm bar, all fasteners and stress bearing shaft are stainless steel. They need only to be cleaned occasionally to remove accumulated grime which may hinder their operation. At the end of each season, tighten any loose bolts or screws, clean accessible hardware with a non-abrasive cleaner, and use a silicone lubricant only on the 1/2" round shafts that protrude from each end of the roller. Also extend all telescoping arms as far as possible to wipe off accumulated sand and dirt that can clog and scratch the protective aluminum finish. No lubrication is required on these parts.

Girard B-25 Awnings

There are two types of Girard awnings - motorized and crank. Both are lateral arm awnings which are easy to use and care for.

The **crank awning** is extended manually. It has a telescoping hand crank which inserts into a receiver on the bottom of the awning. To extend or retract the awning, insert the end of the crank into the receiver and turn it a quarter of a rotation clockwise, then let the handle drop about a half inch - at this time, you should feel the handle lodge into the receiver. The awning is now ready to be extended or retracted.

To open the awning, rotate the handle counter clockwise. To close the awning, rotate the handle clockwise. When the awning is extended, push up on the handle and turn the crank counter clockwise a quarter turn, this will release the crank handle from its housing.

The **motorized awning** operates from a single switch. There is a switch located in the doorway of the coach with an up arrow, a stop, and a down arrow on it. To extend the awning, push the down arrow. To retract the awning, push the up arrow. You do not need to hold the button down once it has been activated. To stop the awning at any point, push the stop button.



WARNING: The awning motor is not intended for continuous use. If it is used excessively, it will shut off until it has cooled down.

Some motorized awnings are equipped with a wind sensor, if so, there will be a sensor cup on the roof of your coach. In the event that high winds hit the sensor cup, the awning will automatically retract, as long as it has a 120VAC power source.



WARNING: Do not allow water to pool in the center of the awning. It can cause severe damage to the awning.

Maintenance

The acrylic fabric of the awning needs to be cleaned regularly to remove the accumulation of dirt. First, brush off any loose dirt. Then hose the fabric off and clean with a cloth and a mild solution of natural soap and lukewarm water (under 100 degrees F). Then rinse thoroughly to remove soap and allow it to air dry. If you need to retract the awning while it is wet, extend it at the earliest opportunity to continue drying.

See the Girard B-25 Owners Manual for further instructions on operation and maintenance.

PHONE JACKS

The phone jacks in your coach are standard extension jacks, compatible with almost all phone equipment.

WASHER/DRYER

A Washer/Dryer combination unit is an option available for many models. This appliance is an extraordinary convenience - combining both the washer and the dryer in the same compact unit. The full operating guide is provided in the warranty package.

If a dishwasher is also installed, then power to these two appliances is directed through a switch in the galley. This switch allows only one of the two to be operated at a time.

The washer/dryer operates on 120VAC power, on a circuit not fed by the inverter. Either a shore line must be hooked up, or the generator must be running. The washer/dryer drains directly to the sewer connection, and thus you must be connected to a sewer line to operate it.



WARNING: Do not attempt to use the washer/dryer without being hooked up to a sewer line.

DISHWASHER

A dishwasher is an option on some models. The full operating guide is provided in the warranty package.

If a washer/dryer is also installed, then power to the dishwasher is directed through a switch on the galley that prevents both appliances from operating simultaneously. A plumbing cutoff valve is located under the galley sink.

ICEMAKER

An icemaker is a feature on many models. It draws its power from your shore line or generator. If turned on, it can also draw its power from your inverter. There is a cutoff valve for this appliance under the galley sink. (Locations may vary. In some models this valve may be located under the sofa).

Since the icemaker can run off the inverter, left unattended it can become a serious draw on the house batteries. If you wish to minimize the amount of time spent running the generator, you should run the icemaker as little as possible. Let the icemaker run long enough to make the amount of ice you plan to use, then turn it off. The icemaker should remain cold enough to keep the ice frozen through the day.

Never use an ice pick, knife or other sharp instrument inside the ice maker. These items may damage the interior of the icemaker.

Never use hot air blowers to speed melting of ice or frost as you may damage plastic components and unit insulation.

Always keep the lower front panel free of all obstructions. Obstructions in this area will interfere with free air movement in and out of the icemaker.

For more detailed information on how to operate the ice maker, refer to the operations manual.

SMOKE ALARMS

Refer to your operations manual for further instruction on operating your smoke alarms.



WARNING: Alarms should be tested weekly in order to assure proper operation. Test the smoke detector operation after the vehicle has been in storage, before each trip, and at least once a week during use. In order to keep the fire extinguisher in a safe and operable condition, inspect it regularly, having it recharged as needed according to the manufacturers directions.

CO DETECTOR

Once power is supplied, the detector will run through a warm up and self check for ten minutes before beginning to monitor for CO gas. There are no switches to allow the unit to be accidentally turned off, so the CO detector will provide reliable protection by alerting you of the build up of potentially dangerous levels of CO gas on a continuous basis.

If the green light is on and the red light is off and there is no sound, the CO Detector is operating normally.

If the CO Detector beeps and the green light is on and the red light is flashing it is in test mode. Wait one minute, then momentarily press the test button.



WARNING: If there is beeping and the green and red lights are not flashing CO gas has been detected. Evacuate the premises and call the fire department.

When both lights are off and there is no sound, check the power source. There is no power.

If the green light is off but the red light is on and there is no sound, the CO Detector has a failure in its circuitry.

PROPANE DETECTOR

The propane detector is mounted near the floor on the side of a galley cabinet. Its purpose is to detect propane leaks, but it is sensitive to other gases, such as those found in hair spray, perfumes, and alcohol.

The propane detector is operating at all times when the coach 12V system is on. It is off when the master cut off switch is shut off. You can tell if it is working if the green light is on. When it is turned on, the detector will begin monitoring the immediate environment for combustible vapors.



WARNING: If it detects a combustible vapor, the red indicator light will flash and a pulsating alarm will sound until the gas has dissipated or until the mute button is pressed.

CHAPTER FIVE

TRAVELING

To get the full enjoyment from your motor home, you have to do a little preparation. The time you spend planning and preparing pays off tremendously when you reach your destination and can enjoy its pleasures without worry.

This chapter gives some general guidelines for traveling in your motor home. It includes checklists to help you avoid forgetting those important details, tips for getting the most from your equipment, and other helpful ideas. The information is very general - for more specific descriptions of your coach and its systems, please read the appropriate sections elsewhere in this manual and the supplement.

BEFORE YOU LEAVE HOME

Planning your vacation should begin long before you leave home, and the longer the trip, the more planning is required. Planning means more than packing - there are many things to arrange in your home, with your finances, and in your coach.

YOUR HOME

Before you ever leave your home for a trip in your coach, first make sure that your home is prepared for your absence. You will want to make sure that your belongings will be cared for, and that your house is protected against calamities such as burglary and fire. The following checklist highlights many of the most important precautions.

Arrange for deliveries, such as the newspaper, to be discontinued.

Arrange for a friend to care for your animals and plants, and to check on the house periodically.

Arrange for the post office to hold your mail.

Notify the police that you will be absent.

Inspect your house for fire hazards.

Burglar-proof your home as effectively as possible.

Place valuables and important papers in a safe deposit box or fireproof safe.

Arrange for your lawn to be mowed and other outside maintenance to be taken care of.

If you plan on full-timing, there are some special considerations to take care of. Some of these include:

Arrange for an effective mail drop. Organizations such as the FMCA (Family Motor Coaching Association) provide this service for a reasonable fee.

Make sure your valuables and important papers are safely stored, preferably in a safe deposit box.

Always make sure that someone knows where you are, and check in regularly.

FINANCES

Regardless of whether you are a full-timer or just planning a short vacation, make sure that you have made all the necessary *financial* arrangements. It can be difficult to cash checks on the road, so a widely recognized credit card is essential. Make sure that the limit on the card is high enough to handle your anticipated expenses, plus an emergency fund. A supply of travelers checks is handy for purchases that can't be handled with the credit card. With automated teller machines as common as they are, there is little reason to carry large sums of cash.

PACKING

When you are packing for a trip, keep in mind that regardless of how large your coach is, there is a limit to its storage capacity. Furthermore, cargo has a way of expanding as you go, so you should start as light as possible. It is easier to buy things that you forgot to pack than it is to jettison things you didn't really need but are cluttering your compartments.

While packing your coach, keep two things in mind: turning and braking. For your coach to handle well, you will want the load to be evenly distributed side-to-side and front-to-back. In addition, heavy items should be stored as low as possible to keep the coach from becoming top-heavy. Make sure that everything is secure - safe from potholes, switch-backs, and sudden stops.

While you're packing, give a thought to the drive, as well as the activities you plan at your destination. Make sure that every passenger has something to occupy his or her attention while on the road. Books, games, and crafts are all possible ideas.

PREPARING THE COACH

Before you leave you should make sure that your coach is ready to go. All of the items mentioned in the checklist here should be checked before you leave the driveway, and should be checked again periodically on any long trip.

Check the battery fluid levels - both house and chassis batteries.

Check tires for cuts and punctures in the sidewall and tread areas.

Check tires for severe weather cracks that expose steel cords.

Check for foreign objects in between dual tires.

Check all fluid levels on the chassis and generator. See the manuals for specific instructions.

If you have a diesel engine, clean the fuel/water separator.

Make sure that all scheduled maintenance for your chassis has been performed.

Check the tire pressure and make sure that all lug nuts are tight.

Check that all lights, including the running lights, are functioning.

Adjust the mirrors. Check the windshield wipers.

Check the house battery power level, using the monitor panel. If low, attach a land line to provide 120VAC power to the coach and they will recharge automatically.

Fill the water tank and make sure the waste tanks are empty. Test the pump.

Fill the LP Gas tank. Test the appliances before leaving home.

Test the generator.

Make sure you have the following items in your coach: sewer connection, water fill hose, "land line" power cable, and awning rod.

Make sure you have enough fuel during your trip.

In addition to all of these items, read the section on breaking camp for an additional list of items to check before driving your coach.

LOADING THE COACH

Your motorcoach chassis has been engineered to safely support your unit as well as any reasonable amount of personal cargo. However, as with any vehicle, abuse can occur through oversight or overloading. When loading your motorcoach, please follow these guidelines:

Be sure to distribute the cargo weight evenly from side to side. This practice will prevent both handling problems and uneven stress on the components throughout the life of the coach. Whenever possible, heavy items should be stored near the rear axle, lighter items stored toward the front. In order to maintain a low center of gravity and to prevent top heaviness and reduce sway, store light items in the overhead cabinets and heavier items near the floor.



WARNING: *Towing vehicles with a hitch weight in excess of 5000 lbs. should be avoided as it will place undue stress on components and cause unusual handling characteristics in your motorcoach. It could also void your warranty. Refer to your chassis manual to figure out how much your coach can tow. If there are any questions call a factory technician.*

Since water weighs about eight pounds per gallon, some RV owners prefer to fill water tanks near the end of a days travel. Carry only a minimum amount in the tanks during the day, this will help reduce weight and improve fuel economy.

Multi-purpose items, versatile clothing, and a periodic removal of unused cargo enables you to store more of what you usually use.

Secure loose items to prevent weight shifts that could effect the balance of your vehicle.



WARNING: *Never mount cargo (lawn chairs, bicycles, etc.) to the front bumper as interference with air flow may cause serious damage and void the warranty. Check first with your manufacturer's service and warranty department.*

WHEN YOU REACH CAMP

Once you've reached camp, it's time to enjoy some of the amenities your coach can provide. The local conditions, the length of time you plan on staying, and the type of campground you are enjoying determine which of the following items apply to you:

Block the tires and level the coach using the hydraulic levelers.

Make sure the LP Gas flow valves are open and ready for use.

If in a full-service campground, hook up the land line, sewer connection, water line, and if available, the TV cable and phone extension.

Extend the awnings, especially if hot and sunny.

CAMPING

While camping you should enjoy all the amenities your motorhome provides. At the same time, you should keep an eye on the limited resources your coach can carry. Monitor the levels of your water, waste tanks, LP Gas, and battery charge on a regular basis, and act accordingly.

If you have a land line, electricity will not be a problem for you, but LP Gas may still be. Keep the refrigerator on its automatic mode to take advantage of the 120VAC power, and use the microwave oven rather than the gas stove whenever you have a choice.

If you have a sewer connection you should keep an eye on the tank levels and empty them only when there is a significant amount of waste in them.

If you don't have the benefit of a land connection you must be much more careful with your resources. Most of the water is used in the bathroom, to bathe and to flush, and by appliances which may be installed in your coach.

You can conserve water by relying less on these appliances, and by being more efficient in the bathroom. Only a small amount of water should be used in the toilet bowl unless solid waste must be flushed, and the toilet valve should not be left open for more than a moment. The section on the shower describes how to save water while bathing. The most effective way to save LP gas is to avoid running the generator, which in turn requires the careful management of your 120VAC appliances. Switch the refrigerator to run only on LP gas, and limit your use of other large appliances. You can utilize the house batteries for a portion of your 120VAC power, through the use of your inverter, without starting the generator.

Watch the holding tank levels carefully. Few things are as unpleasant as an overflowing waste tank.

BEFORE YOU LEAVE CAMP

Before you ever drive your coach there are certain items that you must be sure of. These are summarized in this list:

Make sure that all awnings are retracted and locked - both on the arms and on the roller.

Make sure that all levelers are completely retracted. Make sure all tires are unblocked.

Make sure that the electric step is retracted.

Unhook and stow the land line, sewer and water lines, TV hookup, and any other connections.

Check the refrigerator and all cupboard and appliance doors and make sure they are latched.

Inspect the coach and storage bays for items that are not secured or stable.

If you have a roof rack, inspect the roof for items that are not secure.

Make sure the door is secure.

Make sure the roof top TV antenna is cranked down.

CHAPTER SIX

MAINTENANCE

Your motorhome is designed to be the highest quality, most durable product of its kind. With proper maintenance your motorhome will provide years of excellent use. But regular attention is vital if you are to enjoy your investment to its fullest.

In addition to the advice presented in this manual, every appliance also has special service requirements. Some of these are highlighted here, but you must read the other manuals in your warranty package to learn all of the details and procedures. Do not assume that this manual contains everything you need to know about these components.

Engine and chassis maintenance are covered in the chassis manual. Be certain to have the engine serviced and perform the required maintenance indicated in the chassis owner's manual.

EXTERIOR MAINTENANCE

Your coach's exterior is designed to be attractive, but it is also constructed to be a durable and impenetrable shield for the rest of your coach. It protects your coach from the environment, and prevents water from penetrating your coach and destroying its contents. It is also easy to maintain, and spending time cleaning and inspecting it is a prudent investment.

After every trip you should wash the exterior of your coach. Use water and mild soap - never an abrasive or caustic cleanser. Be careful not to spray water directly into louvers and vents. While you are washing the coach, check for damage to the skin, caps, skirts, and moldings.

If you use a tar or road oil remover, make sure that the product is safe for painted surfaces.



WARNING: In the first thirty days that you own your coach, do not use an automatic car wash. Stiff brushes or sponges may damage the surface. Do not wax or polish the coach for the first sixty days.

Some coaches are coated with a very durable polyurethane paint and acrylic urethane clear coat. No wax is necessary. For the first six months to a year all that the coach will need is to be washed occasionally. After that, you may wish to polish the coach every other year to keep it looking it's best. Use a good polishing compound, **not** a wax.

Some coaches are finished with a polished gel-coat. These coaches need to be washed with a good car wash and a soft mitt. Then,

at least four times a year, it should be waxed with a good boat wax for maximum protection.

When cleaning the exterior, do not neglect the exposed metal. Usually all that is necessary is the same soap and water solution used on the rest of the coach. Do not use chrome polish on any metal except chrome, and never use steam, caustic soap, or auto polish on the aluminum parts. On aluminum you may use a tire sidewall cleaner, but rinse afterwards thoroughly with clear water.

Moisture blows into the locks, hinges and crank handles and then freezes. As the temperature drops, oil and grease begin to thicken, making operation difficult. Eliminate such problems by using powdered graphite for lubrication instead of petroleum lubricants. Squirt the powder into locks, hinges, and cranks and then wipe away the excess.

The window tracks should be inspected and cleaned along with the rest of the coach. If the windows do not open easily, clean the tracks with a water and a small stiff brush. You can lubricate the tracks with a silicone lubricant.

On alloy wheels you should use a good polish, such as a flitz polish.

INSPECTION

While cleaning your coach you should also inspect the exterior for damage and leaks. Any flaw which might allow moisture to penetrate the exterior should be repaired promptly. Fixing a leak is generally much cheaper than fixing the damage the leak can cause.

Almost all leaks occur at seams, such as around the windows, skirts, and caps. All of these must be carefully checked for signs of problems. Look for bent moldings and flanges, missing or loose screws and rivets, and sealants which have cracked, peeled, or separated.

Check each of the following areas for problems:

On the roof, where the caps meet the roof skin, and around vents and air conditioners.

On the walls, where wall skin meets the skirts, roof, cap, and other skin pieces.

Around every window, vent, utility door, and entry door.

Inspect the waste holding tank piping and termination.

The cargo boxes are designed to resist water, but they are not waterproof.

INTERIOR MAINTENANCE

The interior of your coach can benefit from regular attention. For the most part, maintaining the interior of your coach is much like maintaining a home. No special products are required - everything you need can be purchased at a grocery store.

Cabinetry

Wooden surfaces should be cleaned with non-abrasive wood cleaners, and you may wish to apply a liquid spray wax. Wood's greatest enemy is humidity. Your coach has cabinets made of western alder, rift-cut oak, or walnut all of which are resistant to humidity damage. Even so, if you are storing your coach in a humid climate, use a dehumidifier or provide heat to help defend the wood.

Furniture

Your upholstery can be cleaned with a standard upholstery cleaner. Vinyl should be cleaned with a vinyl cleaner, and carpet with common carpet shampoo or spot remover. When using a stain or spot remover, place a cloth on the underside of the fabric wherever possible.

This way, if color bleeds, it will bleed into the cloth rather than into the fabric. Never use lacquer thinner or acetone.

For UltraLeather and UltraSuede, daily care requires only to wipe off the dust and dirt with a soft, dry cloth. Occasionally, UltraSuede needs a light brushing with a medium-bristle brush. These synthetic materials are durable and stain resistant, requiring very little care. Spots are easily lifted with a mild detergent - for tough spots a mild cleaning fluid may be necessary. *For information on specific types of stains and their remedies, see the manufacturer's care instructions.*

Carpet

Top quality residential, stain resistant carpet is used in all Beaver coaches. Clean them as you would the carpets in your own home with normal vacuuming and shampooing as necessary. If stains occur, use a good quality carpet stain solvent or spot remover. If it is large or a stubborn stain that persists after these procedures, consult a professional carpet cleaning service. *Note: Do not soak carpet with solvent to remove the stain. This could cause the carpet to separate from the backing.*

Countertops

Fountainhead counters are built to be durable and beautiful. To prevent scratching, all counter tops should be cleaned with a non-abrasive cleanser. Do not put hot pots or pans directly on any counter top. Scratches in Fountainhead can be removed by careful buffing. The proper buffing materials can be purchased in home centers and cabinet supply shops.

Dash and Plastics

Your dash is covered with vinyl. Vinyl should be wiped down with a damp sponge and if needed, a diluted household cleaner.

Plastic surfaces, like those on your stereo unit or VCR, need special care to prevent scratching. Use a good quality plastic polish. Follow the instructions on the container. For everyday dusting, wipe

with a clean, dry cloth. Never use paper towels to wipe the surface as they are abrasive and will scratch the finish.

Bathroom Fixtures

The tub, sink, and toilet in the bathroom have a fiberglass finish. These can be cleaned with a liquid cleanser. Do not use scouring powder as it will scratch the surface. Brass fixtures can be wiped with a clean, dry cloth to prevent water spotting.

The vinyl wall covering should be wiped down with a damp sponge. Never apply or spray cleaner full strength directly onto the surface. It could damage the vinyl.

Doors and Hinges

If the bedroom door panels become hard to slide, lubricate both the upper and lower tracks using a silicon auto wax or lubricant that will not leave a residue, you can use Lemon Pledge as well. Check the squareness of the panels and if they are not square, tap the corners using a plastic or rubber mallet, or a hammer and a block of wood until squareness is regained. If the door rattles check to make sure that the door is completely closed and the center interlock is engaged.

If the cabinet doors are out of adjustment, it is easy to realign them by adjusting the hinges. The special euro-style hinges are not screwed into the wood of the cabinetry, instead they are more like a clamp which can be adjusted by loosening the hinge with the single screw, aligning the door as necessary and tightening the screw.

EQUIPMENT

Every component of your rig has special requirements. *Read each appliance manual for specific instructions.* The data in this manual is simply an overview. This manual does not replace the manuals provided by the individual manufacturers.

GENERATOR

Your generator contains a complete engine, which has the same kind of maintenance requirements as any engine. This includes lubrication, inspection of coolant level, and other procedures listed in the generator manual. The monitor panel includes a clock showing the hours of usage for the generator. Watch the clock, and perform the maintenance operations required by the schedule in the manual.

LP GAS

Never neglect your LP Gas system. Regularly trace the lines and look for flat or kinked spots. It is wise to inspect and test the system before and after long and rough trips. Make sure that cargo cannot crush or damage the lines. Finally, turn the gas on and check each fitting for leaks. Wipe each fitting with very soapy water and look for bubbles. Read the chapter on LP Gas for further instruction.

TIRES

While you are inspecting the rest of the exterior, you should also pay some attention to the tires. Tires are crucial for safe and comfortable driving, and also can indicate problems with the suspension. At least monthly, and certainly before any long trip, they should be inspected.



WARNING: The most common cause of tire failure is improper inflation. A plate in the interior of your coach lists the correct pressures. Check the pressure of each tire and add or remove air until it is somewhat below the recommended pressure. This should be done while the tires are cold. Driving will warm the tires and increase the tire pressure to the recommended level.

Check the tread of each tire. If the tread has worn to less than 1/16", replace the tire promptly. Check for abnormal wear patterns. The tire should wear evenly across. If the wear is not even it can indicate improper balancing, alignment, inflation, or bearing wear. Take your coach to a service center for maintenance.

If there is any damage to the tire, such as cuts, bulges, or peeling tread, replace the tire immediately. Remove any rocks lodged in the tread. Check for loose lug bolts.

Even standing still, your tires can age and wear. Your tires have two major enemies - sunlight and unchanging weight. The ultraviolet rays in sunlight ages the tire and causes dry-rot of the tire walls. Unchanging weight creates weakened flat spots. If your coach will sit for any length of time, cover the tires with cloth or cardboard. Use jacks or levelers to reduce the load on the tires, if practical. Rotating the tires to a different position periodically is also recommended to avoid a flat condition on the tires.

When replacing tires, always select a tire of the same size and specifications.

The front end of your motorcoach was professionally aligned prior to leaving the factory. Remember, cargo loaded into your motorcoach affects wheel alignment. Tire tread worn lopsided indicates realignment needs. Don't ignore these signs. Have a front end shop check your vehicle once each season for alignment and tire balance.

BATTERY CARE

Your batteries also require a certain amount of attention on a regular basis. Your coach has two sets of batteries - one set for the "house" 12VDC requirements, and one set for the engine. Remember to check both sets regularly. Identify each battery cable to be positive or negative before making any connection. Always connect the negative ground cable last.

Make sure that each battery is clean and dry, and that all connections are tight and free from corrosion and oxidation. You should remove the cables from the terminals and clean both the cables and the posts with a battery brush on a monthly basis. A light application of petroleum jelly or mineral grease will help reduce corrosion and oxidation. Check that each battery has the proper electrolyte level, and if necessary add distilled water. Never add sulfuric acid or other electrolyte to the battery - it is the water that evaporates, not the electrolyte. Finally, make sure that the batteries are charged, especially before storing the unit.

PLUMBING

The plumbing systems require very little maintenance. Visually inspect the lines occasionally for damage, and watch for hazards to the lines such as sharp or heavy objects stored close to them. Clean the holding tank hook-up assembly regularly.

Neglecting your plumbing system will result in a pernicious problem - bad odor. In the freshwater system, unpleasant tastes and odors can be prevented or removed by the regular flushing of the tank with a baking soda solution. For the waste tanks there are commercial products available for help control odors.

CHAPTER SEVEN

STORAGE

We generally think of our garages and storage areas as havens for our coaches - free from the stress and strains of use, we expect the coach to emerge from storage in perfect condition, ready for the next adventure.

This is possible. You can store your coach for long periods of time and retrieve it in a condition similar to when you left it. But it requires some preparation and some respect for the problems long-term storage presents. While being stored, your coach will face humidity,

heat and cold, and the erosive effects of time. If stored outdoors, it will also face wind, rain, snow, and sunlight. And it will not likely be inspected as regularly, or maintained as promptly, as when it is in active use.

So to keep your coach in fine condition you must make preparations. The first thing to consider is the storage area itself. Obviously an inside area is far preferable to any outside storage. In virtually every city there are storage areas available for rent. Regardless of the price, it is definitely worth the investment for the preservation of your coach. A heat source is also definitely worthwhile, since it will help control condensation and prevent mildew.

Make sure that you inspect the coach regularly. Many of the problems which occur when storing can be easy to fix if caught early, but expensive if allowed to fester. Follow the same inspection routine you use when on the road, and look particularly for leaks, water damage, and mildew. You will also want to run the engine briefly, along with the dash and roof air conditioners and generator.

Finally, prepare your coach. Full directions are given in this chapter. Many service centers will prepare your coach for a reasonable fee.



WARNING: Your warranty does not cover damage due to freezing during storage, or damage caused by neglect. You are responsible for your coach's maintenance during storage.

PLUMBING

The most important system to prepare is your plumbing. Even if you don't expect freezing temperatures to occur, we still strongly recommend you prepare for the worst.

There are two ways to winterize your plumbing: drain the system completely, or add a potable anti-freeze. For almost all situations, draining is easier and more reliable.



WARNING: Only use a potable anti-freeze approved for use in RV water systems. Never use automotive, windshield, or any other non-potable anti-freeze.

To drain your system, start with the water tank. Open the tank drain valve and leave it open. Then start the water pump and open several faucets. Run the pump until no more water comes out.

Open the low-point drain valve and all hot and cold faucets. Open the shower flow valve (on the shower head) and set the shower head on the shower floor to drain. Drain the water heater by removing the drain plug. Allow the water to drain completely with all hot water faucets open. Care must be taken to avoid hot water burns.

Every appliance you have that uses water (dishwasher, ice maker, washer/dryer) must be drained, also. Run these appliances dry - at least one cycle for the dishwasher and washing machine, and until the ice maker makes no more ice. Open the flush valve on the toilet and leave it open.

Finally, if possible you should blow the lines out with compressed air. Insert a compressed air source - no more than 35 PSI - to the city fill connection. Make sure that all faucets and valves - including the toilet - are open. No special adapter is necessary. However, you may wish to purchase an air chuck for this purpose, available from most RV stores.

ICE MAKER

The ice maker should be completely defrosted before the coach is winterized. Check your ice maker operation manual for further instructions on how to properly shut down the system for storage.

REFILLING THE SYSTEM

When you are ready to use the coach again after it has been winterized, the freshwater tank will need to be filled. Turn on the pump switch, then open all faucets, both the hot and cold. Allow time for the water heater tank to fill and then shut off each faucet as the flow becomes steady and free of air. With the water heater tank filled and all air expelled from the system, close off the last faucet. This will cause the pump to shut off.

WASTE

Preparing the waste systems has two goals - damage prevention and odor control. Empty the tanks as you would normally at a dump station. The black holding tank is cleaned by flushing it out with a garden hose attached to the flush fitting. The grey water holding tanks can be flushed by turning on your faucets. One method to rinse both black and grey holding tanks is to fill them at least 1/2 full with clean water and one cup Trisodium Phosphate. Drive the vehicle a few miles to agitate and dissolve any residual solids and then drain the tanks completely. Every sink, shower, and equipment drain should be flushed with a hot soapy water solution, then rinsed. The tanks should be rinsed. If possible, add a chemical deodorant to the black waste tank and allow it to stand for several days. Then completely drain and rinse each tank.

The sewer termination assembly should be cleaned. The knife valves should be lubricated with a light oil. The toilet valve should also be lubricated.

OTHER SYSTEMS

Your LP Gas system requires virtually no maintenance. Simply turn the flow valves off. Do not attempt to drain the system.

The generator requires the same type of attention as any engine. A full schedule of maintenance requirements is given in the generator manual.

Your roof air conditioners should be operated occasionally to ensure the compressor seals remain lubricated. The dash air should be turned on for a few minutes while the engine is running.

There is a switch on your stairwell that cuts off the house batteries. By tripping this switch you can avoid draining these batteries. Be sure the batteries are charged beforehand.

If the coach is stored for a short period (two weeks or less) plug it into external power. This will retain a full charge on the coach batteries. For long term storage, be sure to disconnect the coach from external power and turn the battery cut-off switch to the "off" position.

MOISTURE PROBLEMS

One of the most common and expensive problems that can arise during storage is moisture damage. When in storage, leaks can go undetected, condensation can collect, and temperature fluctuations can exacerbate moisture damage. Virtually your entire coach is vulnerable. Fabrics can become mildewed. Cabinetry can swell and split. And walls, if penetrated, can rot and warp. Any of these can be expensive to repair, and are not covered by your warranty.

Fortunately, moisture problems can easily be prevented with just a little foresight. There are three factors that cause or contribute to moisture problems. All of these are best controlled if you keep your coach indoors. Storing the coach outdoors makes it far more vulnerable, and it is not recommended for long-term storage.

Water's first path of entry is a leak. Leaks obviously open the walls and interior to penetration by rain, snow, or dew. Therefore, inspect the coach for leaks before storing it, and check it periodically during storage.

Temperature fluctuations increase the amount of condensation and make wood more vulnerable to damage. Temperatures below freezing are particularly hard on your coach. Therefore you should strive to maintain a constant temperature in your coach. A small electric heater can be effective, but do not attempt to use the coach's furnace for this purpose.

Humidity is the source of condensation. The primary defense against humidity is circulation. If you are storing your coach in a climate-controlled area, open all the doors, cabinets, closets, and drawers to allow air to move freely through these confined spaces. Open at least two windows at least slightly so air can move through the coach. Inspect the coach regularly for signs of condensation.

CHAPTER EIGHT

SERVICE AND WARRANTY

Beaver works hard to ensure that you receive a quality unit that will serve you with a minimum of problems. However, your motorhome contains thousands of components, assembled by hundreds of technicians, with countless procedures. These components are subjected to conditions far harsher than they would find in any stationary housing. They face vibration, dust, and extremes in temperature and humidity. Inevitably, some problems will arise. Beaver is ready.

SMC Corporation has a full Service and Warranty system designed to take care of you and your coach. The keystone is our Service and Warranty department, and its' fully equipped service center.

In addition to working on your coach, they can give technical advice over the phone, and arrange for service by other centers across the country. They take pride in serving you.

But to get the most from our service system there are a number of things that you should know. This section outlines our procedures and methods, and gives many recommendations for you to follow when something happens to you on the road.

The most important step - please fill out all of the warranty registrations which come with your coach, especially the Beaver registration form. We cannot authorize any service under warranty without the registration, nor can most of our vendors.

SERVICE CENTERS

SMC Corporation supports two fully equipped service centers, for both warranty service and customer-paid work. One is located near corporate headquarters in Harrisburg, Oregon, about fifteen miles north of Eugene. The other is situated in the heartland of America, Minneapolis, Kansas. The centers work by appointment only, arrangements can be made by calling the appropriate number listed at the end of this chapter.

The Factory Service Centers are very popular, especially during the summer. Call well in advance for service appointments. Drop-ins cannot be accommodated.

The service centers can perform all kinds of warranty work. In addition, appointments can be made for problems not covered by the warranty or after the warranty has expired, on a paid basis

The Service Center also provides service at major rallies across the country. Crews from the factory provide service on coaches at the rallies, as much as possible in the limited time allowed. This service is free, although there is a charge for parts which are out of warranty.

The service center is also a valuable source of advice and information, for both yourself and for technicians working on your coach. If another service center needs specific information on a Beaver product, they can obtain it by calling our factory technicians. The technicians aren't a replacement for your manuals, but they will answer any questions not covered in these books.

Owners that are attempting modifications to their coach should consult the Beaver factory prior to making any changes as this may result in a loss of warranty coverage.

SERVICE ON THE ROAD

If you have problems with your coach during the warranty period, your first option is your dealer. However, your dealer is not the only service center available to you. Any reputable service center can work on your coach during the warranty period, if it is prearranged.



WARNING: If you need to have your coach worked on by someone besides a Beaver dealer, call the Service and Warranty department before starting. Beaver will work with the service center to arrange reimbursement of the cost, and exchange of parts, if necessary. Work that is not prearranged may be denied coverage under your warranty.

Any defective parts must be returned to the respective factory for you to be reimbursed. The part should be shipped with a copy of the invoice for the new part. Beaver needs the part to determine the nature of the problem, and without it we cannot reimburse you or the service center.

Most service centers require appointments for maintenance and most repairs. The more you arrange in advance, the fewer problems you will encounter.

APPLIANCES

Each of the appliances in your coach, including the generator, water heater, furnace, air conditioners, as well as the kitchen appliances, has a warranty provided by its manufacturer. The first step in ensuring good warranty service on these items is to fill out every warranty card in your pack and send them to the manufacturers.

Please note that Beaver does not warrant the various appliances in our coaches. These are each covered by their own manufacturers' warranties, and warranty claims on these items should be handled through the appropriate manufacturer. This includes labor for replacement.

Beaver will no longer accept appliances for credit or cross-ship appliances, but will be happy to assist you in making arrangements with the appliance vendor, if necessary.

With these appliances you have several options. Many of the manufacturers have authorized service centers scattered across North America, and these generally offer the easiest and best service. To find one of these centers, consult the literature provided or call the manufacturer directly.

Your second option is to use a reputable service center. The key to efficient service is to contact the manufacturer *before* having the service performed. In most cases the manufacturer will work with the service center to take care of your problem.

Finally, the Beaver Service and Warranty department can act on your behalf in the same way as any other service center.

WHERE TO CALL

The following chart lists the service numbers of many of the companies with products in your coach. These are your best first avenue for support on their products.

Make sure that you call the correct manufacturer. Look for the manufacturer's label on the appliance and look up the correct company on the list below. If you are unable to find the number for the correct manufacturer, call your coach manufacturers service center.

Service Numbers		
Air Conditioner - Dash	Acme	800-552-2263
Air Conditioner - Roof	Duo-Therm	800-544-4881
Antenna	Winegard	319-754-0600
Aqua-Hot	Vehicle Systems	800-685-4298
Awnings	Carefree	800-621-2617
	Girard	800-382-8442
Camera	Intec	714-859-3800
Chassis	Magnum	800-344-6332
Dishwasher	White-Westinghouse	800-277-1828
Electric Step	Kwikkee	541-836-2126
Engine	Caterpillar	309-578-7433
Fire Extinguisher	BRK	708-851-7330
Fuel Filter	Winn	800-235-2851
Furnace	Suburban	615-775-2131
Furniture	Homestyle	800-574-0574
	Villa	
Generator	Onan	800-888-6626
GPS	Delco	800-428-0501
Icemaker	U-Line	414-354-0300
Inverter	Heart	800-446-6180
Levelers	RVA	619-746-5732
LP Gas Tank	Brunner Engineering	800-753-8265
Microwave Oven	Sharp	800-237-4277 or 800-526-0264
	General Electric	800-626-2000
	Quasar	800-447-4700
Range	Seaward	310-699-7997
	Gaggenau	615-643-4556
Refrigerator	Norcold	800-543-1219

	Dometic	800-544-4881
Solar Panel	Siemens	805-482-6800
Stereo	Delco	800-428-0501
Television	Panasonic	809-750-4300
	Sharp, Quasar	800-447-4700
Tires	Toyo	310-537-2820
	Goodyear	216-796-3867
Toilet	SeaLand	800-321-9889
Transmission	Allison World	317-242-0236
VCR	Quasar	800-545-2672 or 800-447-4700
Vent	Fantastic	800-521-0298
Washer/Dryer	Splendide	504-229-4922
Water Heater	Suburban	615-775-2131
SMC Service Center and Parts - Harrisburg, OR	425 N 3 rd St Harrisburg, OR 97446	877-466-6226
Heartland Service Center, Minneapolis, KS	1196 N. 110 th Rd. Minneapolis, KS	800-392-2877
Beaver Motor Coaches	Technical Advisors and Warranty Claims	800-843-2967