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*This manual is not intended to be used in lieu of any individual component maintenance and operating manuals. Where information in this manual and component manuals differ, the individual component manual shall govern.*

# WARRANTY

GLENDALE RECREATIONAL VEHICLES  
Limited Warranty  
Travel Trailer, Fifth Wheel  
Three Year Structural  
One Year Limited Warranty

## WARRANTY OVERVIEW:

Glendale warrants every Glendale recreational vehicle to the first retail consumer for a period of one (1) year and three (3) years on the structure from the date of purchase under normal use and service when used for its intended purpose of recreational travel and camping that all parts of our manufacture are free from substantial defects in material and workmanship. The warranty period shall begin on the date the retail consumer takes possession of the vehicle.

This warranty is expressly in lieu of all other warranties expressed or implied and all other obligations or liabilities on our part of any kind or character, including liabilities for alleged representations or negligence. We neither assume nor authorize any person to assume for us any liability in connection with the sale of recreation vehicle, other than expressed in the above paragraph.

Upon receipt of notice of a claim, the manufacturer or its authorized dealer will repair or replace any parts which it determines to be defective. The manufacturer's obligation shall be limited to such repair or replacement.

For a warranty claim to be honored, the owner must give written notice of his claim to an authorized dealer or the manufacturer not later than 10 days after the date the warranty period expires. This notice must include the serial number of the recreational vehicle.

All authorized dealers, whenever possible, will provide emergency repairs to a traveling owner if he finds himself in trouble while away from his home dealership. Because of the difficulty in determining whether the service required is warrantable, an authorized dealer may invoice and charge the owner, who in turn should submit said same invoice(s) to his home dealership for reimbursement.

## 3 YEAR STRUCTURAL WARRANTY:

Glendale warrants the structure of the sidewalls, floor and roof to be free of material and manufacturing defects.

## EXCLUSIONS:

- (1) Items added or changed after the vehicle left the possession of Glendale, alterations made outside of Glendale's factory or without Glendale's knowledge, or in Glendale's judgment may change the effect, suitability or reliability of the coach.
- (2) Any vehicle used for commercial purposes.
- (3) Normal wear and usage, such as fading or discoloration of soft goods (upholstery, drapes, carpet, vinyl, cushions, mattresses), fading or discoloration of exterior plastic or fiberglass components, tears, punctures, soiling, mildew, effects of moisture condensation inside the vehicle, or mishandling, including glass and light bulbs, neglect, abuse, misuse, lightning or other acts of nature, or corrosive atmospheres which can result in rusting, oxidation or pitting.
- (4) Minor imperfections that do not affect the suitability of the vehicle for its intended use.
- (5) Normal and routine maintenance such as inspections, caulking, lubricating, adjustments, tightening of screws, tightening of lug nuts and wheels, sealing, rotating; cleaning, or damages arising from the failure to have maintenance performed as outlined in the owner's manual. Minor adjustments such as adjusting appliances, doors, windows, latches, mouldings, LP gas regulators, etc. which may be required after the first 90 days of the warranty period are considered normal maintenance.
- (6) Alignment or adjustments to axles or spindles when caused by improper maintenance, loading or damage from road hazards, including off road travel, wheel damage or balancing, or damage resulting from tire failures.
- (7) Loss of time, inconvenience, commercial loss, incidental charges such as towing, service call fees, telephone calls, hotel bills, loss of use of trailer or any other consequential damage. Costs incurred for transportation of the vehicle to a dealer or Glendale Recreational Vehicles. Work unauthorized or performed by an unauthorized dealer or service center without Glendale's knowledge may impede reimbursement from Glendale and or your selling dealer.
- (8) This Limited Warranty does not apply to or cover any component which is warranted separately by its manufacturer. Examples are: tires, axles, wheels, running gear components, batteries, appliances, TVs, VCRs, power converters, jacks, etc.
- (9) This warranty is not valid unless the warranty registration has been completed and mailed to Glendale Recreational Vehicles at the time of purchase. The written warranty provided by each component manufacturer is a direct responsibility of that manufacturer. Glendale makes no warranty as to those components. Please refer to the written warranties issued by such component manufacturers for the terms and provisions of their written warranty undertakings. Warranty information with respect to these items is available from your dealer.

**INTRODUCTION**

**Read This Manual** - Many convenience and safety features are built into your trailer. Read this manual to become familiar with the proper use and care. Each appliance also has its own information booklets to detail their use and care. We have put these together in the vinyl pouch that also contains your keys and this owner's manual.

**Safety Standards** - Your trailer has been designed and built to conform with, or exceed, the Canadian CSA Standards Z240, and/or the American national Standards Institute A119.2, NFPA\_501C and applicable motor vehicle safety standards. These relate to the electrical, plumbing and propane quality and safety. Compliance with these standards is indicated by the exterior seal affixed adjacent to the entrance door.

**Cargo Capacity** - Proper loading is essential to the safe towing and road handling of your trailer. This manual has sections to detail how much you can safely load. Do not exceed the rated loads of the trailer or your tow vehicle.

**Propane Safety** - Propane is a gas that is stored in liquid form under pressure. The cylinders, hoses, valves and regulator are designed to safely supply propane vapor at very low pressure to the appliances in your trailer. This manual has sections that describe the safe use of propane.

**Electrical Safety** - The electrical circuits and components in your trailer are protected by fuses, circuit breakers and ground fault interrupters. Do not alter any part of the electrical system. Always use the ground prong on the supply cord in a properly grounded park receptacle.

**IF YOU SMELL GAS:**

Extinguish any open flames, pilot lights, and all smoking materials.

1. Do not touch electrical switches.
2. Shut off the gas supply at the tank valve(s) or gas supply connection.
3. Open doors and other ventilating openings.
4. Leave the area until the odor clears.
5. Have the gas system checked and leakage source corrected before using again.

**Reporting Safety Defects (USA units only)** - If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Glendale Recreational Vehicles.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Glendale Recreational Vehicles.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-888-327-4236 / 1-800-424-9153 TTY (or 366-0123 in Washington, DC area) or write to: NHTSA, U.S. Department of Transportation, Washington, DC 20590 ([www.safercar.gov](http://www.safercar.gov)). You can also obtain other information about motor vehicle safety from the Hotline.

**Identification** - Record the following information about your trailer:

Model: \_\_\_\_\_

Date of Manufacture: \_\_\_\_\_

Date of Purchase: \_\_\_\_\_

VIN: \_\_\_\_\_

**FIRE AND LIFE SAFETY**

**Fire Extinguisher** - Take the time to understand the use of the fire extinguisher. In an emergency there will be no time to read the instructions. Make sure that everyone in your household who might need to use the extinguisher is completely familiar with its operation. Review the instructions weekly. Your trailer is equipped with a 5-B,C rated fire extinguisher specially designed to fight grease, oil and electric fires (the most common kinds of kitchen fires). It is mounted close to the main entry door. To use it, simply pull the extinguisher. The cap flips up, releasing the extinguisher from its bracket, so you can save precious firefighting seconds. Pull out the ring/pin, stand six feet back, hold the extinguisher upright, aim at the base of the fire and press the trigger to discharge the powder. Make sure the fire is not between you and your escape path.

Always use extreme caution when fighting a fire. Fight a fire only when there is a clear escape path to allow you to get out safely if the fire gets worse. Avoid breathing the smoke and heated fumes. Stay low if necessary. If the fire is too hot or smoky for you to get within two (2) meters (6 feet) of it, do not try to fight it yourself. Warn everyone, evacuate the premises, and have someone call the Fire Department as quickly as possible. The extinguisher contains a dry powder-extinguishing agent. When using it, avoid breathing the powder.

Check the extinguisher once a week by pressing the green test button on the top of the cap. If the button pops up, the extinguisher is ready to use. If the button does not pop up, the extinguisher has lost its pressure and should be replaced immediately. Do not test the extinguisher by spraying it. It will gradually lose pressure once the lever has been pressed.

After using the extinguisher, ventilate the area. Completely discharge the extinguisher's contents outdoors. Discard and replace the extinguisher. Do not puncture or incinerate the empty extinguisher. Do not attempt to remove the nozzle or valve assembly.

**WARNING**

**PORTABLE FUEL-BURNING EQUIPMENT, INCLUDING WOOD AND CHARCOAL GRILLS AND STOVES, SHALL NOT BE USED INSIDE THE RECREATIONAL VEHICLE. THE USE OF THIS EQUIPMENT INSIDE THE RECREATIONAL VEHICLE COULD RESULT IN FIRE OR ASPHYXIATION.**

**Escape Windows** - Your trailer is equipped with one or more escape windows to provide a second means of egress in the event the main entry door(s) cannot be used. Every sleeping area has two paths of escape. Take the time to familiarize yourself and the members of your household with the location and operation of each escape. Keep these paths clear. Do not install storm windows over escape windows.

**Smoke Detectors** - Most fire casualties are due to smoke inhalation, not the flame. The smoke detector responds to the smoke. It does not detect gas leaks, heat or flame. Test the operation after the trailer has been in storage, before each trip and at least once a week by depressing the test button. If the alarm fails to sound, check that the batteries are full or replace them with fresh batteries. You should replace a defective smoke detector immediately. Refer to the smoke detector operating instructions for proper disposal.

**Emergency Equipment** - Carry the following items as basic emergency equipment. Some of these items are standard on the unit or are available from your dealer.

- First aid kit
- Hydraulic jack and lug wrench
- Fire extinguisher
- Flashlight
- Road emergency flares

## **TOWING TIPS**

**Tow Vehicles** - The wide range of Glendale travel trailers and fifth wheels enables them to be towed by many types of vehicles. There is no substitute for the proper equipment when it comes to towing the additional weight of a trailer, so it is very important that you follow the recommendations of your tow vehicle manufacturer for the size and weight of the trailer you are towing. The trailer weight can be found on the label at the outside front corner of the trailer as the gross vehicle weight rating. In selecting your new tow vehicle or adapting an existing tow vehicle to your new trailer, we recommend the installation of a trailer tow package consisting of heavy duty rear springs, radiator, alternator, transmission cooler, battery and shock absorbers. Tires with load-carrying capacity equal to the added hitch weight must be used. With most travel trailers, an equalizing-type hitch should be installed to spread the hitch weight as evenly as possible over all wheels and axles.

**Brakes** - All our trailers and fifth wheels are equipped with electric or hydraulic brakes on each wheel. To operate them, your tow vehicle must be equipped with an electronic brake controller. The trailer brakes can be operated manually by applying the lever at the brake control and automatically by applying the brakes of your tow vehicle. During automatic operation, you should have the trailer brakes start acting slightly before those of the tow vehicle, so that the trailer is actually pulling against the tow vehicle thus keeping the two vehicles in alignment. This is particularly helpful during rainy weather because if the tow vehicle were to set its brakes first, the trailer would have the tendency to push the tow vehicle or possibly jack-knife. Note that hydraulic brakes specifically require "inertia" based controllers ("time" based controllers are not recommended).

**Travel Trailer Hitch** - The tow vehicle must be fitted with a hitch that has a capacity at least equal to the GVWR (gross vehicle weight rating) of your trailer or fifth wheel. It is important to keep the tow vehicle and the trailer level in order to maintain equal weight distribution and ensure maximum steering control. While the use of the helper springs and/or overload shock absorbers on the tow vehicles will improve performance, the safest and best results are obtained when an equalizing hitch is used. The purpose of the weight-equalizing hitch is to divide the load between the tow vehicle axles and the trailer axles, which helps keep the tow vehicle level to maintain good handling and headlight alignment. Too much tension on the hitch torsion bars can have as much adverse affect on tow vehicle stability as does not having enough torsion bar tension.

**Coupling - Travel Trailers** - Most Glendale travel trailers are equipped with couplers designed to be used with 2-5/16" hitch ball. The small compact trailer series uses 2". Be sure that you have the right diameter hitch ball and class hitch for your trailer coupler. Lubricate the hitch ball with universal bearing grease or hitch ball lubricant.

Before lowering the coupler onto the hitch ball, make sure the coupler-locking arm is pulled up and back to the unlocked position. Lower the hitch jack until the ball is firmly seated in the coupler. The latch can now be moved downward to secure the coupler around the ball. Secure the coupler latch with a pin or bolt through the hole provided. A padlock through this latch will serve as a theft deterrent.

**RAISE THE HITCH JACK AGAIN TO PULL UP ON THE BALL. THIS WILL VERIFY THAT THE COUPLER IS COMPLETELY LATCHED.**

Connect the torsion bars if you are using a load-leveling hitch. Fully retract the hitch jack to ensure that it will not be damaged by coming into contact with the ground while you are towing.

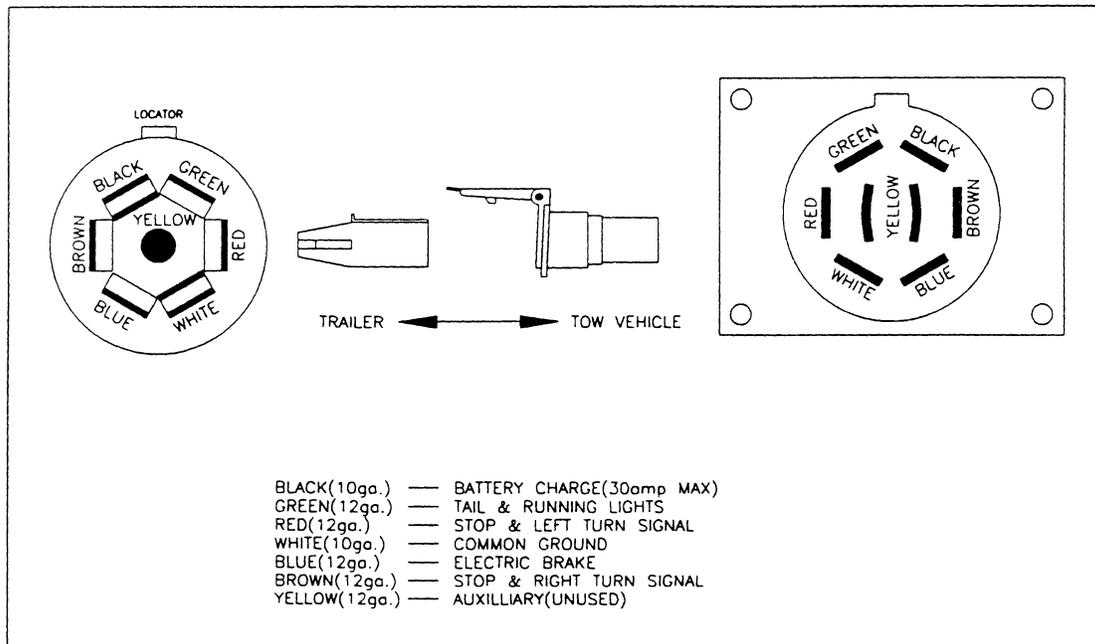
**Safety Chains** - Connect the safety chains in a criss-cross pattern so there is enough slack to allow for when the trailer is being turned sharply. The chains should be oriented in a manner designed to prevent the tongue from dropping to the ground and to maintain connection to the tow vehicle in the event of failure of the ball and coupler connection.

**Breakaway Switch** - Connect the breakaway switch lanyard so it will not pull tight before the chains are tight. Care should be taken to ensure that the breakaway switch actuating cable would not open the switch until complete separation from the tow vehicle has taken place. This would include failure and disengagement of the hitch mechanism and also failure and disengagement of the safety chains and ensure that normal brake control is maintained until complete separation. Do not hook the lanyard over the hitch ball. Test the operation of the breakaway switch before each trip. Do not leave the pin out for more than a few minutes. The battery will drain quickly.

**\* CAUTION \* Never tow the trailer without the trailer battery being hooked up and fully charged. It is the power source for the brakes should the trailer become separated from the tow vehicle.**

**Trailer Cord** - Plug the 7-way trailer cord into the tow vehicle socket. Take care to route the cable so it will not be severed by the coupler in a sharp turn. Do not allow so much slack that it may contact the road while you are towing. This cord connects the trailer running lights, turn signals and brakes to the tow vehicle. Before proceeding, run an operational check of stop lights, turn indicators, and running lights. Place your door step into its traveling position. Check the brakes, trailer first if possible, then both together (refer to instructions included with brake controller). Ensure the tow vehicle's side mirrors are in place and properly adjusted. Check wheel lug nuts for tightness. On new trailers the wheel nut torque should be checked at 15, 40, 90 and 200 km (10, 25, 50 and 80 miles), and then after every 500 km (200 miles) of travel. Follow the torque sequence recommended by the axle manufacturer. This information is in the axle operation maintenance service manual. Check the cold tire pressure before each trip.

**Schematic of 12-Volt Car Connector**



**Hitch - Fifth Wheels** - The truck hitch capacity rating must be equal to or greater than the Gross Vehicle Weight Rating (GVWR) of the fifth wheel you are pulling. The GVWR of the fifth wheel is listed on the label located on the outside front corner of the fifth wheel. Open the hitch-locking device in the truck and lower the tailgate. You may choose to remove the tailgate for easier coupling and uncoupling.

Back the truck slowly to engage the kingpin into the hitch latch plate. It is important that the pin box strike the angled portion of the hitch for correct engagement (the angled portion then swings up during engagement). On some hitches, the latch plate will engage the kingpin automatically, but the handle grip must be pushed to the locked position (see manufacturer's instructions for full details). On other hitches, the same lever will be used to engage the kingpin (manually) and to lock it in position.

Visually check to see that the hitch is locked around the correct portion (smaller diameter) of the kingpin. **THIS IS IMPORTANT!**

Before raising the fifth wheel landing jacks, test the security of the hitch lock by pulling the truck gently forward. Be careful. You don't want to damage the jacks.

Once you are certain the coupling is secure, raise the tailgate of the truck, raise the front jacks of the fifth wheel trailer, remove and store the pads. Notice that the lowest section of the landing jacks can be retracted up inside the jack by pulling the side pin and pushing the leg up. This part of the leg is also the first part to be lowered when you want to unhook the fifth wheel from the tow vehicle.

Plug the 7-way trailer cord into the truck socket. Route this cable clear of any part of the hitch plate. You don't want the cord to be severed during a sharp turn. Attach the safety cable for the breakaway switch to a part of the truck hitch. Keep the cable in a straight line with the switch on the fifth wheel so that the pull on the pin is in a straight line with the cable and so that there is enough slack to allow for turns.

**\* CAUTION \* Never tow the fifth wheel without the trailer battery being hooked up and fully charged. It is the power source for the electric brakes should the fifth wheel become separated from the tow vehicle.**

Before proceeding, run an operational check of stop lights, turn indicators and running lights. Place your door step into its traveling position. Check the brakes, fifth wheel first if possible, then both together (refer to instructions included with the brake controller). Ensure that the tow vehicle side mirrors are properly adjusted. Check wheel lug nuts for tightness and tire pressure before each trip.

**Kingpin Box Maintenance** - Check the nuts and bolts that secure the pin box in its sleeve every 3,200 km (2,000 miles). They must be torqued to 50 - 55 ft. lbs. Grease the contact surface with lithium based grease every 3,200 km (2,000 miles). If the pin box is damaged or worn, it must be replaced. Do not attempt to repair it.

**Wheels** - It takes some time for the wheel lug bolts to seat into new wheel rims. Re-torque the lug nuts often. If the nuts are covered by a decorative plastic cover, it can be removed by sliding it straight off. ***It is the responsibility of the driver to ensure the nuts are maintained tight:*** the torque has been set with a torque wrench. The factory setting will not hold without tightening at several intervals. Failure to follow the instructions below can result in a rim coming loose. The use of a torque wrench is mandatory. A cross bar tire iron is not a substitute for a proper functioning torque wrench. See Figure 1 on page 7 for the torque sequence.

**IMPORTANT - Tighten all wheel nuts at the following intervals of travel when new:** At 15 km of travel you must tighten the nuts to the full torque using a torque wrench. Repeat this at 40 km (25 km since the first re-torque), 90 km (50 km since the last re-torque), 200 km (110 km since the last re-torque), and then after every 500 km of travel. See Table 1 for torque values. Learn to check before each trip and intermittently during long trips. The painted finish on the rims should be washed and waxed regularly.

If a rim is damaged it must be replaced. Do not attempt to repair a rim. The replacement must match the original bolt circle, capacity, offset and rim contour. When replacing the tire valve, make certain that it is rated for the cold tire inflation pressure of your tires. Do not attempt to resolve a rim leak by installing a tube. The air pressure could result in an explosive rim failure.

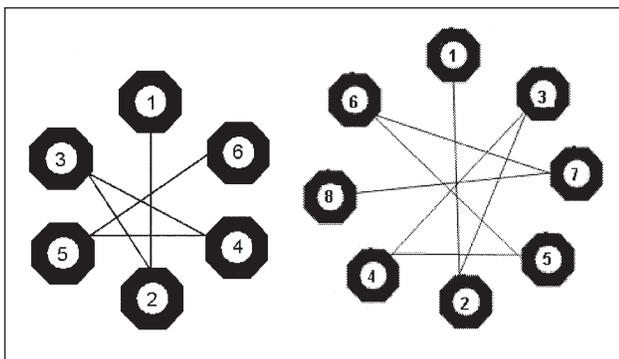
**Tires** - The tires were chosen to match the gross axle weight rating (GAWR) of your trailer or fifth wheel. When an original tire is replaced, make certain that the replacement tire is of equal rating. Check your tire pressure periodically to see that it conforms to the recommended level. The maximum pressure for the tires is indicated on the label at the left front exterior of your trailer or on the specification sheet on the inside. Tire inflation pressure is the most important factor in tire life. It should be checked cold before operation. Do not bleed air from tires that are hot. Low tire inflation will reduce the weight carrying capacity of the tire and will lead to early tire wear or failure. Over-inflation will lead to early tire wear or failure.

Clean the tires regularly to remove road oil and dirt. Dirt will hold chemicals that could deteriorate the rubber. Use a soft brush and mild soap. When using tire dressings, avoid products that contain petroleum or alcohol. These chemicals will attack the antioxidants in the rubber and reduce tire life.

When parking your trailer for extended periods, clean and cover the tires to reduce the effect of heat and sunlight. Remember that the age of the tire is more important than the depth of the tread remaining. As they age, inspect them more often.

**Changing a Tire**

1. Place blocks in back and front of the tires on the opposite side to the one being changed.
2. Uncouple the trailer from the towing vehicle while on level ground.
3. Lower the front end of the trailer with the hitch jack.
4. Place stabilizer jacks under each mainframe member 2 - 3 feet from the rear end of the trailer chassis.
5. Loosen the wheel lug nuts prior to lifting the trailer.
6. Raise the front end of the trailer, using the hitch jack, high enough to lift some weight from the springs.
7. Place a small jack under the axle and lift the tire off the ground.
8. Remove the tire and wheel.



**Fig. 1: Tightening sequence for 6 and 8 bolt rims**

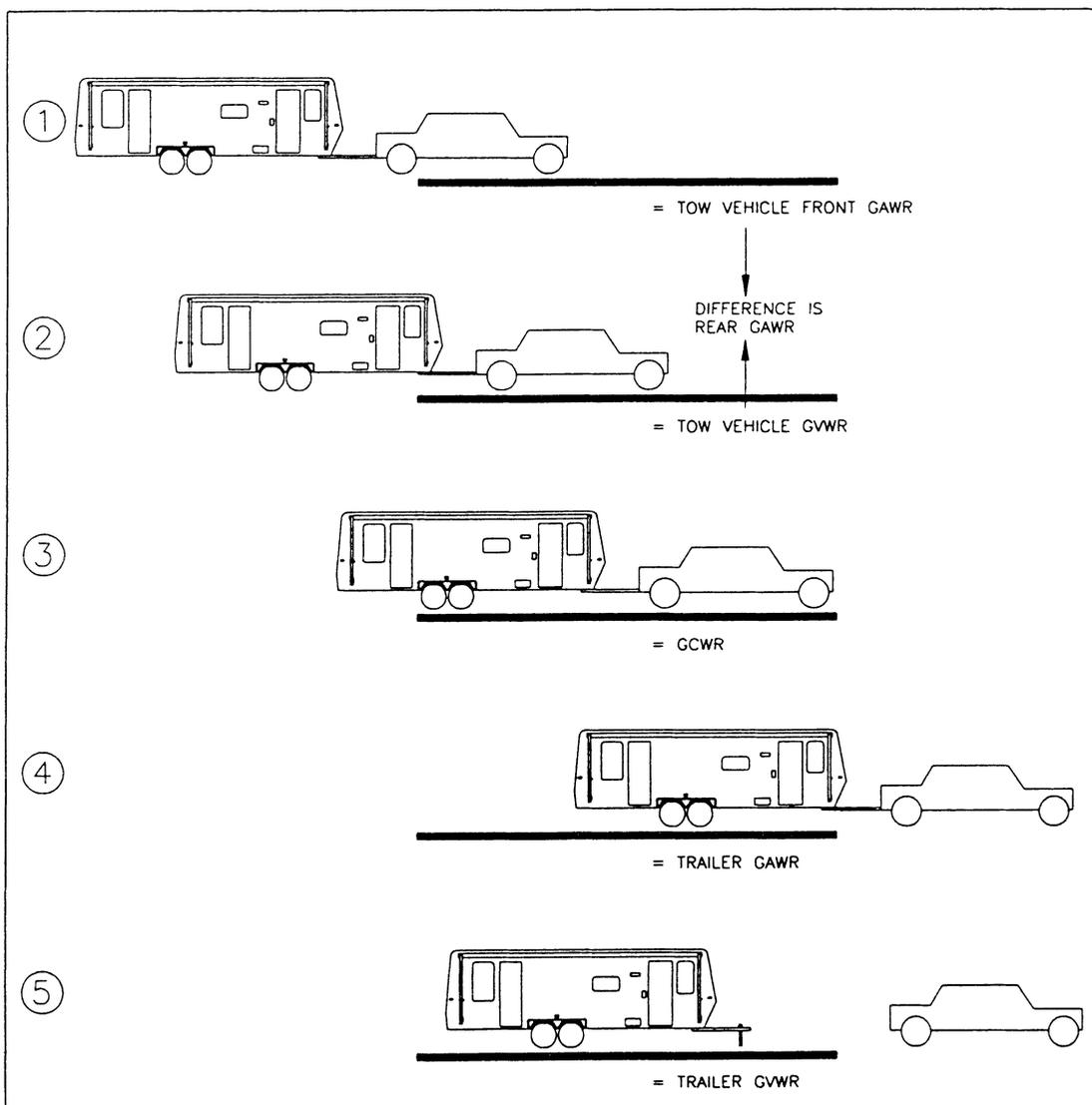
**Table 1: Torque Values for various sizes and types of rims**

Aluminum Rim Torque		Steel (painted) Rim Torque	
6 bolt	8 bolt	6 bolt	8 bolt
100 ft lbs	120 ft lbs	120 ft lbs	120 ft lbs

**LOADING YOUR TRAILER**

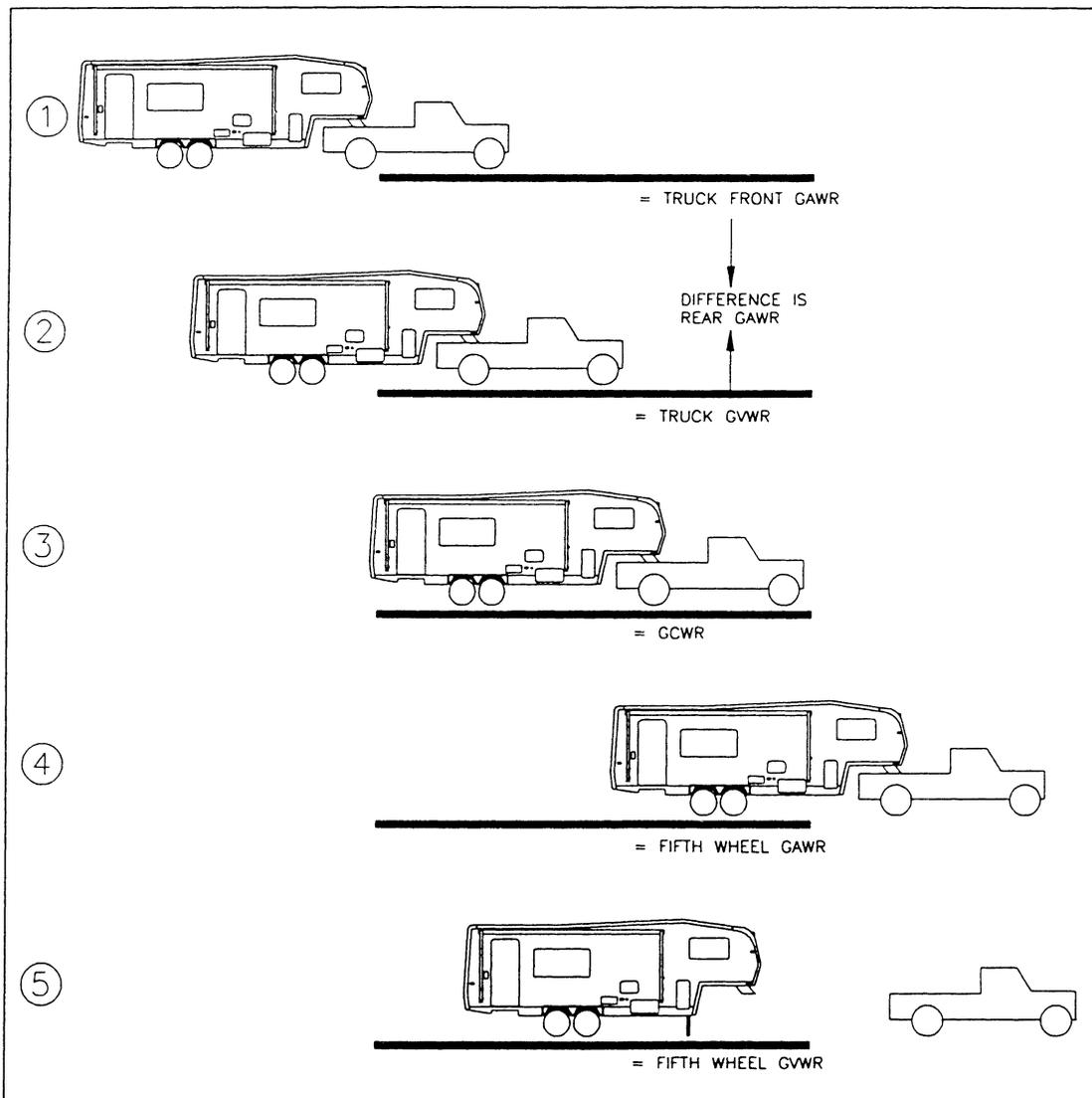
Trailer weight and weight distribution are major factors, both in safe handling and economical operation. Do not overload either your trailer or towing vehicle. An overloaded vehicle can become very unwieldy and create an unsafe condition in addition to placing excessive stress on the running gear. The trailer has been engineered to function up to the gross vehicle weight rating (GVWR) when fully loaded with all the necessary traveling supplies. In addition, the gross axle weight rating (GAWR) for each axle must not be exceeded. The GVWR and GAWR can be found on a label located on the exterior of your unit.

To determine that your loaded trailer is within these gross weight ratings, weigh your vehicle when loaded with all your traveling supplies. Any roadside weigh station should be able to assist in determining the axle weights and overall weight. Front to rear weight subtracting your axle weights from the total weight can check distribution. This will show how much weight is located on your hitch. Remember that distribution of weight to the axles and hitch will vary depending on how much water you are carrying. It is advisable not to travel very far with your holding tanks full. Traveling as light as possible provides better fuel economy, decreased engine loads and easier towing.



**Adding Cargo to Your Trailer** - Properly loading your recreational vehicle is of utmost importance for your driving comfort and safety. Make every effort to distribute the load as evenly as possible throughout the trailer, generally trying to keep the heavier objects as low as possible and over or forward of the axles. Pack heavier items such as canned foods, beverages, tools and cooking utensils as low in the trailer as possible. Overhead storage should be reserved for lightweight objects such as paper products, bedding, clothing and dry foods.

We recommend that you travel with empty wastewater holding tanks. Water weighs ten (10) pounds per imperial gallon (8.3 lb. per US gal.), so traveling with full waste holding tanks can add up to five hundred (500) pounds of weight to your trailer. This will affect handling and fuel economy. Using the following information, you can readily calculate your trailer's cargo capacity. Proper loading will become routine as you gain travel experience. Your coach is not designed to tow anything.



**Gross Vehicle Weight Rating (GVWR)** - The GVWR of your recreational vehicle is listed on the STATEMENT OF COMPLIANCE (SOC) label on the side of your unit. It can also be found on the specification label located on the inside of a wardrobe or kitchen door. This figure represents the maximum permissible weight of your trailer, including any additional weight that is added as cargo. The GVWR is equal to or greater than the sum of the unloaded vehicle weight plus the cargo carrying capacity, plus the weight of fresh (potable water) full (including water heater) and the weight of full LP-gas containers. **IT IS IMPORTANT THAT THE GROSS VEHICLE WEIGHT RATING IS NOT EXCEEDED WHEN LOADING YOUR CARGO.** Measure the total weight after unhooking from the tow vehicle. The hitch and all tires should be on the scale.

**Gross Axle Weight Rating (GAWR)** - The GAWR of your recreational vehicle can be found on the same label that lists the GVWR. These are important figures to follow when loading your recreational vehicle with personal cargo. Distribute the cargo so that the gross axle weight rating is not exceeded. The axle weight should be measured while the trailer is hitched to the tow vehicle, and with the hitch torsion bars in place.

**Unloaded Vehicle Weight (UVW)** - This is the approximate weight of the trailer as built at the factory. If applicable, it includes full generator fuel, engine oil and coolants. The UVW does not include cargo, fresh water, LP-gas or dealer installed accessories. Due to the natural variations in the weight of the plywood and lumber components of your trailer, the UVW rating is approximate.

**Cargo Carrying Capacity (CCC)** - This is equal to GVWR minus each of the following: UVW, full fresh (potable) water weight (including water heater), full LP-Gas weight.

**TRAILER WEIGHT INFORMATION**

VIN or Serial Number

GVWR (Gross Vehicle Weight Rating) is the maximum permissible weight of this trailer when fully loaded. It includes all weight at the trailer axle(s) and tongue or pin.

UVW (Unloaded Vehicle Weight) is the weight of this trailer as manufactured at the factory. It includes all weight at the trailer axle(s) and tongue or pin. If applicable, it also includes full generator fluids, including fuel, engine oil and coolants.

CCC (Cargo Carrying Capacity) is equal to GVWR minus each of the following: UVW, full fresh (potable) water weight (including water heater) and full LP-Gas weight.

<b>Cargo Carrying Capacity (CCC) Computation</b>	<b>Pounds</b>	<b>Kilograms</b>
<b>GVWR</b> .....		
<b>Minus UVW</b> .....		
<b>Minus Fresh Water Weight of</b> <b>Gallons @ 8.3 lb./gal.</b>		
<b>Minus LP-Gas Weight of</b> <b>Gallons @ 4.2 lb./gal.</b>		
<b>= CCC for this Trailer *</b> .....		

\* Dealer installed equipment will reduce CCC  
 Consult the Owner Manual(s) for specific weighing instructions and towing guidelines.

**Towing Checklist**

- entry step stowed and secured
- entrance door locked
- all windows closed
- all roof vents closed
- TV antenna retracted
- front window canopy securely latched
- gas bottles secured and valves closed
- battery fully charged and secure
- breakaway cable secured to tow vehicle
- coupler latched and locked
- safety chains connected (travel trailer only)
- 7-way cord plugged in and lights operating
- city water inlet capped
- termination valve capped
- power cord stowed
- trunk doors closed and latched
- tires properly inflated
- lug nuts properly torqued
- waste holding tanks empty
- all interior lights and fans off
- sewer hose stowed
- stabilizer jacks retracted (if equipped)
- slide-room fully in (if equipped)
- loose furniture secured
- patio floor in and locked
- patio roof down and locked
- patio doors closed and locked

## ELECTRICAL SYSTEM OPERATION

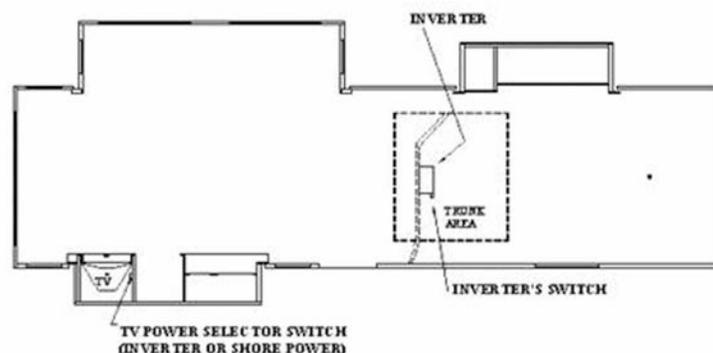
**Power Supply Cord** - The 120-volt power supply cord on your trailer is sized to match the electrical panel inside. The molded plug on the end of it has three (3) prongs in the correct configuration to match the park receptacle. The round prong is the grounding prong. **DO NOT** remove this prong. Your trailer is equipped with an adapter plug. This should be used only when the park site has provided that receptacle. **DO NOT** remove the ground prong. If it is necessary to use an extension cord, be sure it is of the right wire gauge and has a ground prong. Use as short an extension cord as is necessary to reach the park receptacle. Keep your power cord clean, dry and away from sharp objects that might cut it.

**Park Power** - Some campsites are only equipped with 15/50 ampere receptacles. These will require you to use a "cheater" plug supplied with your trailer. In any case the fit into the receptacle should be snug and the cord should not be strained to reach the outlet. A loose fit could result in arcing and damage to your plug. Report this condition to the park electrician.

**\* CAUTION \*** If any of the exterior metal surfaces give you an electrical shock, **NO MATTER HOW MILD, immediately unplug from the park outlet. Have an electrician investigate the cause.**

**Converter** - The electrical system features a 12VDC converter for charging the battery and enables you to use all 12VDC systems such as lights, range hood, power vents, water pump, furnace, etc. whether you are operating on battery or external 120VAC power ("shore power"). Circuit breakers are provided for 120VAC circuits and automotive-type fuses for the 12VDC circuits. **DO NOT** obstruct the ventilation of the converter transformer. The 12VDC circuits that are normally powered by the converter are automatically connected to the auxiliary battery power when shore power is unplugged. When operating from the battery(s), it is recommended that the amount of equipment in use be reduced to conserve battery power. Gradual dimming of lights and slowing of motors indicates low battery voltage. If the 12VDC equipment will not operate from the battery, check wiring between the converter and the battery. If the 50-ampere line fuse is "blown", inspect for overload or "short". **DO NOT** install oversize fuses. There is a 50-ampere fuse at the battery where the black battery wire connects to the other black wires. Keep your converter clean, dry and do not block any of the venting provided, as it must have free flow of air through and around itself.

**Inverter** - The inverter can provide 120VAC power to the TV and DVD tuner by inverting 12VDC power from the battery (use when shore power is not available). To switch your TV and DVD tuner from shore power to inverter power, simply set the TV power selector switch (located in the TV cabinet or slideout wall) from "Shore Power" to "Inverter". Also, ensure the inverter's switch is turned "ON" (inverter located in front trunk as shown in Figure 4).



**Fig. 4: Typical inverter and power selector switch layout**

**Note:** Even with the TV and DVD tuner shut off the inverter will consume some battery power, so be sure to only switch it on when needed. Do not power other appliances with the inverter, it is intended only for the TV and DVD tuner. For improved performance, we recommend installing a second battery to extend inverter run time.

**Optional Inverter/Converter** - An optional combination inverter/converter unit is available to replace the standard converter and separate inverter. If so equipped, the inverter side of this unit will power the TV/DVD receptacle and the microwave in the absence of shore power. Instead of having a TV power selector switch in the TV cabinet, there will be an inverter on/off switch mounted on a wall near the entrance area of the trailer. The combination inverter/converter will stop inverting in the presence of shore power automatically, and pass the shore power through both the TV/DVD and microwave. The unit also acts as a converter providing 12VDC charging to the battery when shore power is available. *Note: For improved performance, we recommend installing a second battery to extend inverter run time.*

**Fuses - 12VDC** - The 12VDC circuits are protected by fuses that are appropriately sized for their use. Replace blown fuses with the same type and size as the original. There are fuses in the electrical distribution center and in the area of the battery. Have your dealer show you where every fuse is.

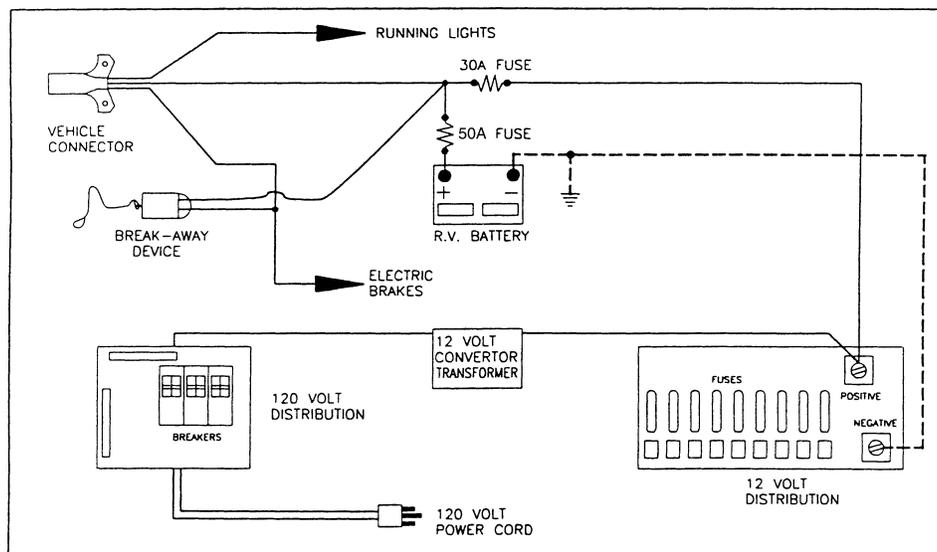
**Ground Fault Protection** - Ground Fault Circuit Interrupter (GFCI) receptacles are used in your trailer to provide protection against line-to-ground fault shock hazards. They do not protect against the shock hazard of user contact with two or more circuit conductors. Do not nail or drill holes in your unit without first determining that no wire will be damaged. There is one GFCI receptacle in most trailers located in the kitchen. Remember that this GFCI protects three or four other receptacles, so if one of them is without power it may be due to the GFCI being tripped.

Pressing the reset button on the GFCI receptacle will restore power to the other receptacles. Tripping of the GFCI can be caused by something plugged into the exterior receptacle. Unplug any item in the exterior receptacle before resetting the GFCI.

**Testing the GFCI** - Test the GFCI receptacle monthly to verify that it is operating safely. It has a test button on it. When it is depressed, the reset button should pop out. Pushing the reset button in will return the normal operation. If the GFCI fails this test, it should be replaced immediately by a qualified electrician. Shock hazard exists. Do not plug anything into faulty receptacles.

**Exterior Weatherproof Receptacle** - This receptacle is located on the curbside of the trailer or fifth wheel to provide a convenient source of 120-volt power. It is usually ground fault protected by being wired to an interior GFCI receptacle. If your exterior receptacle does not have power to it, check that the GFCI receptacle inside your trailer has not been tripped.

Schematic of Electrical System



**Circuit Loading** - The 120-volt circuits are protected by a main breaker. This breaker will trip if the number of appliances and connected loads exceed the recommended rating. Each branch circuit is protected by a 15-ampere breaker, except the air conditioner that is 20 ampere. If each branch circuit were to be loaded to its maximum, the total load would exceed the main rating. Therefore, you must limit the number of things you plug in or run at the same time. This is especially true when you are running the air conditioner, microwave or electric water heater.

If your trailer has an electric water heater, it may share the circuit with the microwave oven or washer/dryer. There is a toggle switch located in the kitchen area to direct current to either appliance. This is so you cannot run both at the same time and over load the main breaker. There is also a switch that must be switched to ON once the heater is full of water. Always turn this switch to OFF when the water heater is empty to prevent accidental activation of the 120-volt heat element.

The main breaker will rarely be tripped. More often, it is the park power breaker that will trip. The load the park breaker will carry can decrease with the distance your plug is from the park's breaker box. Using an extension cord will only make this worse.

**Battery** - Install a battery on the tray provided on the A frame hitch of your trailer or in the trunk of your fifth wheel. There are wires at these locations to be connected to the battery posts. White wire(s) go to the NEGATIVE (-) post. Black wire(s) go to the POSITIVE (+) post.

**\* CAUTION \* Never tow the trailer without the trailer battery being hooked up and fully charged. It is the power source for the brakes should the trailer become separated from the tow vehicle.**

**Choosing a Battery** - There are two kinds of batteries. The automotive battery and the deep cycle battery. Your car or truck uses an automotive battery that is designed to deliver high amperage output for short duration. It rarely gets completely drained.

Through normal use of your trailer you can fully drain the trailer battery. This is why a deep cycle battery is important. It is designed to recover after being drained. Each time a battery is recharged, its capacity becomes less. A battery can never be brought to the original charge. The life of the battery depends on how often it is used.

Keep a fully charged battery connected to your trailer at all times. It is your power source if the 120-volt is interrupted.

**Battery Charging** - The trailer battery can be charged in two ways. From the tow vehicle or from the converter charging circuit. Recharging the trailer battery while the vehicle is in transit is done by means of a 12-volt hot line that connects the tow vehicle battery to the trailer battery. The 7-way car cord plug has a wire (terminal #4) for this purpose. The ability of the tow vehicle to recharge the battery is dependant on the reserve capacity of its alternator. Some alternators have a low amperage rating. Therefore, there is little reserve charge available after supplying the normal needs of the tow vehicle. If the reserve charge is low, then the recharging is going to take an abnormal amount of time. The trailer should be disconnected from the tow vehicle when parked in order to ensure that battery power is retained to start the tow vehicle.

When the trailer is plugged into the 120-volt receptacle at a campsite the battery will be charged by the automatic charging circuit of the converter. The rate of charge automatically decreases when the battery is fully charged. When plugged in for an extended period, check battery electrolyte level frequently.

Cold batteries will not readily accept a charge. Therefore, batteries should be allowed to warm up to approximately 5°C (41°F) before charging. This may require up to four (4) hours at room temperature.

A battery that has been completely discharged may be slow to accept a charge initially, and in some cases may not accept a charge at the normal charger setting. When batteries are in this condition, charging can only be started by use of the dead battery switch on chargers so equipped. The charge circuit of the trailer converter does not have this type of switch. Use of a separate charger will be necessary.

**Battery Venting** - Batteries inside of trunk compartments must be kept inside a vapor tight box that is vented only to the exterior. The box must be vented off the top and off the bottom. The gases produced when the battery is charging are explosive. Keep sparks and flames away from the battery at all times.

**Battery Care** - The battery posts and connections must be kept clean. Coating them with Vaseline will help keep them from corroding.

Top up the cells with distilled water as required. Use only distilled water or battery acid. Cells that become low on water can be permanently damaged. Eye protection should be worn whenever you check or fill the cells. Battery acid is extremely corrosive. If you get any on your hands, face or clothes, rinse immediately with large amounts of water.

Always fully charge a battery before storing it away. Check the charge monthly during storage. A battery that is left more than thirty (30) days will discharge even if it is completely disconnected from the trailer. Once it has lost all its charge, it can freeze and crack the casing. Frozen batteries cannot be repaired.

**Park TV Cable Hook-Up** - Your trailer or fifth wheel may be equipped with a park cable connector. This is wired with shielded coax wiring to the main TV jack inside. The main TV jack receives signals from the park cable connector and the optional roof TV antenna. Use the switch on the jack to select the source. The booster inside the jack amplifies the roof antenna signal only. The booster gets 12-volt power from the 15 amp accessory circuit at the converter. Often additional TV jacks carry the TV signal from the main jack to other areas of the trailer.

**Exterior Entertainment Center** - Your trailer may be equipped with this option. It provides sound from your radio inside to your outside patio area. The volume is controlled at the radio. The coax outlet is for your TV. The adjacent exterior receptacle provides the power for your 120-volt TV.

**Satellite Antenna Hook-Up** - Your trailer or fifth wheel may be equipped with a satellite cable connector. This is wired with shielded coax wiring to the main entertainment area inside your trailer.

**TV and Radio Interference** - TV and FM signals have a range of about seventy five (75) miles in good weather and over flat terrain. Amplifiers cannot "pull" signals from any further; they only magnify the signal they receive. The interference that you sometimes get on your TV or radio is caused by electromagnetic fields produced by electric arc discharge. This arcing can come from the 12-volt motors used in the range hood fans, bath fans and furnaces. The trailer battery plays an important role in reducing interference when the trailer is plugged into park power. It filters out the converter voltage irregularities that are picked up by your radio as hum.

**DVD Tuner** - This unit operates on 120-volt power using the supplied power cord. Follow the manufacturer's operating instructions for the proper use and care. Your trailer or fifth wheel should be connected to a battery even when you are plugged into park power.

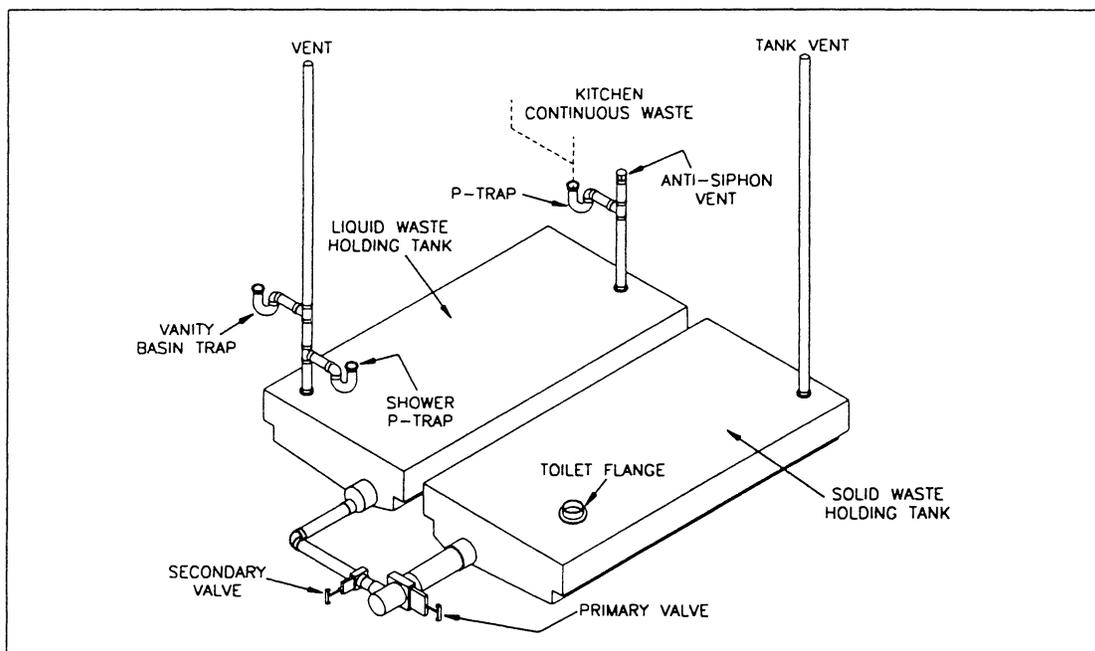
## DRAINAGE SYSTEM OPERATION

Your trailer has a drainage system that is designed to carry wastewater from the sinks, tub/shower and toilet to waste holding tanks. Generally there are two tanks. One is called the gray water tank. It holds the sink and tub water. The other is the black water or sewage tank. It receives the toilet waste. Some models have two gray water-holding tanks, one for the kitchen and one for the bathroom.

**Toilet Preparation** - Before using the toilet, prime the sewage tank with approximately one (1) gallon of water and add a good grade of toilet chemical that can be obtained from your dealer. Do not use "Draino" or caustic-type materials in your drainage system as they can be harmful to the plastic materials used.

The toilet is connected directly to the fresh water system of your trailer so that after each usage the contents are flushed into the holding tank. The tank should not be drained until it is close to being full. On most trailers, there is a systems monitor panel on the range hood that will indicate the status of your holding tanks. Refer to the toilet manufacturer manual for operation of the toilet. Be sure to use enough water in the bowl to properly carry waste to the holding tank.

**Monitor Panel** - Most of our trailers have a monitor panel built into the range hood or wall-mounted to allow easy monitoring of holding tank levels. The sensors work by sending a small electrical current through the fluids in the tanks. Accurate readings can be affected by the mineral content of the water. High or low mineral content can result in false readings. Frequently, the false readings are attributed to coatings that build up inside the tanks. Regular flushing and cleaning of your holding tanks will minimize false readings.



**Tank Draining** - To drain your holding tank, remove the travel cap, connect a sewer hose with the coupling to the main drain outlet. Open the large slide valve fully by pulling the valve handle with a quick motion. When the sewage tank has completed draining, close the valve and pull open the small slide valve to drain the gray water tank. Some trailers have two small valves for the gray water system. Open both of them when draining the system. Add a few gallons of fresh water into the toilet while the gray water is draining so that they are drained. The sewage tank valve can again be opened to flush the sewer hose with clean water.

**Leave the toilet holding tank drain valve closed even when parked at a campsite. Add toilet chemical deodorant to prevent odors. Use the tank until it is almost full, and then drain it completely. This will help prevent clogging of the tank.**

After draining your holding tank, a false reading may occur on your monitor panel due to debris or tissue coating the sensor probes in the tank. Spray inside the tank with high pressure water or clean it with chemicals designed for this job. This will usually solve the problem. Water vapor inside the holding tank will condense on the tank walls similar to condensation on windows at certain temperatures. This condensation on the tank walls can also produce incorrect readings. **Sewer drain cap must always be securely in place when the vehicle is in motion.**

**FRESH WATER SYSTEM OPERATION**

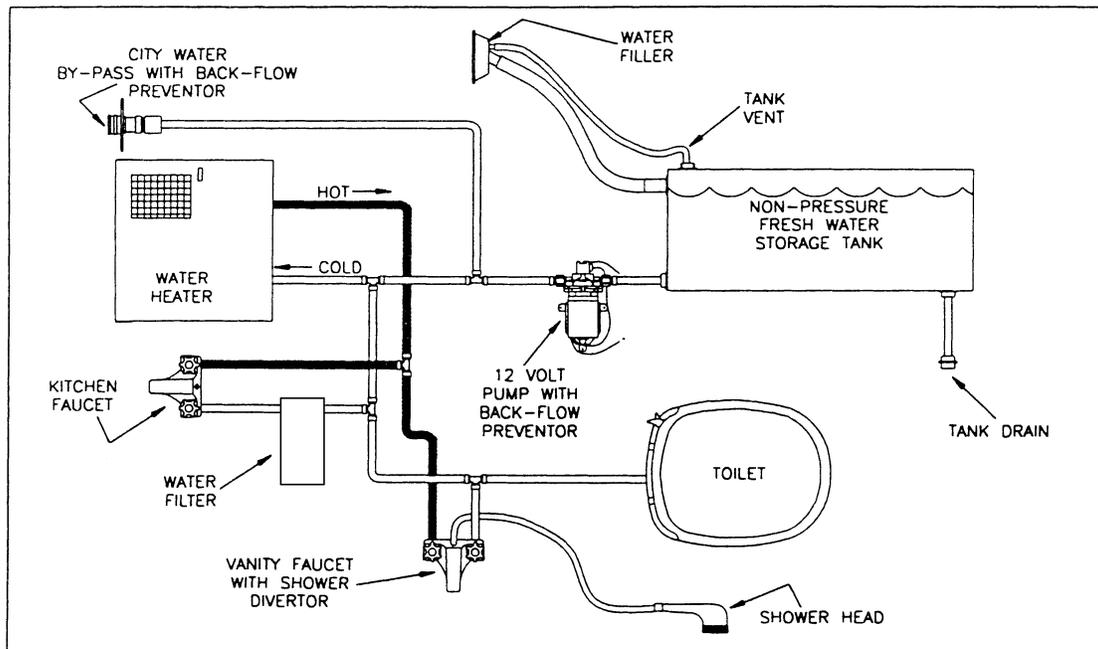
**City Water Connection** - Fresh water may be made available either by connecting a hose to an external water source normally available at a park or campground, or by filling the fresh water tank through the water filler inlet provided on the exterior of your trailer. Use an approved recreational vehicle hose. The standard garden hose will add a rubber taste to the water. When water is being supplied through a city water connection the check valve inside the water pump prevents water from backing up into the fresh water storage tank. The tank can be left empty when you are hooked up to park water.

**Water Pump** - For self-contained operation, your trailer is equipped with an “on-demand” type pump system which senses the pressure drop the instant a water tap is opened and immediately starts pumping water from the tank into the system until the tap is turned off and the pressure again reaches the system balance. The first time you fill your water system, or if your fresh water system has been fully drained, the following procedures may be necessary to allow the air in the lines to escape:

- close all faucets in the kitchen, bathroom, shower and bathtub
- set the water heater by-pass to “normal” operation
- turn the water pump switch to “on”
- open the kitchen hot water faucet until the air escapes and water runs constant. This may take a little time as your water heater has to fill before water will reach the taps.
- close the hot faucet and repeat the procedure for the cold-water faucet
- carry out this procedure for the remaining faucets including the optional exterior shower
- operate the toilet flush valve until water flows into the toilet bowl.

When all the faucets are providing water when opened, the water system is ready for operation and the water pump switch can be left on. Do not leave the water pump switch on when the trailer is left unattended for some length of time. If a leak or break occurs in a water line connection, the pump will sense a pressure drop and continue operating until your water tank is drained.

## Schematic of Fresh Water System



**Water Filter** - The water filter is installed on the kitchen cold water line. Check the separate instruction manual for details on filter replacement.

**Shower Head** - The shower head in the bathroom may be equipped with a handy water saver, so that after the desired water temperature is achieved, you can control the water flow at the shower head as required. In some instances there may be a few seconds of cold water when the showerhead is turned back on as the pressure in the waterlines re-balances. This feature is intended as a water saver while you are showering. It is not a substitute for turning the shower off at the taps when you have finished your shower. The shower hose has an anti-siphon device where it connects to the faucet. This device lets water “leak” out of the hose when the faucet is turned off.

**Hot Water** - The water heater is a fast recovery gas appliance. However, the capacity is less than you are used to in your home, so you must conserve water to avoid running out. When you are filling it for the first time be sure it is full of water before you turn it on. If your trailer is equipped with a water heater by-pass kit, it must be set to “normal” for water to enter the water heater. Heating an empty water heater will damage it. The best way to check that it is full is to pull the lever on the pressure relief valve at the top of the water heater. You will find this on the outside by opening the water heater door. Never perform this check if the water is hot.

**Fresh Water Storage** - Use potable water (drinking quality) only in your water tank. Periodic flushing of your fresh water system is necessary to prevent bacteria growth. Sanitizing can be done by dissolving a box of baking soda in a pitcher of water, pouring it into the tank, then filling the tank and letting it stand for twenty four (24) hours before thoroughly flushing out. When draining tanks, open all water taps. The tank drain is a garden style tap located below the trailer. Leave the water storage tank empty when not in use. Never let water stand in the tank or piping over extended periods of time. Never fill your fresh water tank with a new hose or without thoroughly flushing any residual water from your hose first as this can result in a bad water taste. Use only R.V.-type hoses.

**Instructions for the Disinfection of Potable Water Systems** - (as approved by the US Public Health Service)  
To assure complete disinfection of your potable water system, it is recommended that the following procedures be followed on a new system, one that has not been used for a period of time, or one that may have become contaminated. This procedure is also recommended before long periods of storage, such as over the winter.

1. Prepare a chlorine solution using one (1) gallon water and 1/4 cup of household bleach (sodium hypochlorite solution). With the tank empty, pour the chlorine solution into the tank. Use one (1) gallon solution for each fifteen (15) gallons of tank capacity. This procedure will result in a residual chlorine concentration of 50 ppm in the water system. If a 100 ppm is required as discussed in item 3, use 1/2 cup of household bleach with one (1) gallon of water to prepare the chlorine solution. One gallon of the solution should be used for each fifteen (15) gallons of tank capacity.
2. Complete filling the tank with potable water. Open each faucet and run the water until a distinct odor of chlorine can be detected in the water discharged. Do not forget the hot water taps.
3. Allow the system to stand for at least four (4) hours when disinfecting with 50 ppm residual chlorine. If a shorter time period is desired, then a 100 ppm chlorine concentration should be permitted to stand in the system for at least one (1) hour.
4. Drain and flush with potable water.

**Outside Shower** - Your trailer may be equipped with this optional feature. It provides hot and cold water through a hand held showerhead on a flexible hose. The hose is connected to the taps with an anti-siphon device. It is normal for water to “leak” at this connection when the water is turned off. This is water draining backwards from the shower hose.

**Low-point Drains** - Drain caps have been installed at low points of your water lines. You generally only use them when you are preparing for cold weather storage. Have your dealer identify their locations for you. Check that the caps are secure after you take your trailer out of storage.

**Waterline Connections** - The swivel connectors that are used to connect the waterlines to the taps, pump, toilet, water heater, etc. are designed to be water tight without the use of a wrench. If one of these fittings develops a leak, do not over-tighten it. The rubber cone-shaped washer should be replaced.

## **PROPANE SYSTEM OPERATION**

Your trailer is equipped to use propane that is commonly known as LP-gas (liquefied petroleum gas). Propane is a true gas that is compressed and stored in the gas cylinders under pressure as a liquid. The cylinders must always be handled with care to prevent the liquid from escaping. Never touch the liquid. It will freeze your skin instantly.

The propane is delivered to the appliances in your trailer as a vapor. Its pressure is controlled by a regulator located at the gas bottles. The pressure inside the bottle and up to the regulator will range from 127 PSI (pounds per square inch) at 20°C (70°F) to as high as 230 PSI at 35°C (100°F). The pressure after the regulator and up to the appliances is about 1/2 PSI (11" water column).

Flow of the propane is controlled at each cylinder by a valve. Access to these valves could be behind a door on fifth wheels or under a bottle cover on some trailers. Open the valve fully then back 1/4 turn whenever you are using the appliances. Do not restrict access to these valves. You must be able to get at them in case of an emergency.

**Filling New Cylinders** - New cylinders must be purged of air and moisture before they are filled with propane. Both air and moisture are contaminants that seriously interfere with the operation of the propane system. Air in a cylinder will prevent it from being properly filled as well as interfere with the appliances connected to the system. Air and moisture in a cylinder may react with the odorant that is added to the propane and cause a chemical reaction that may accelerate the odor to fade. This could diminish a person's ability to detect a leak in the cylinder, piping or appliance to which the cylinder is connected.

### **WARNING**

**DO NOT FILL LP-GAS CONTAINERS TO MORE THAN EIGHTY (80) PERCENT OF THEIR CAPACITY.**

Overfilling the LP-gas cylinder can result in uncontrolled gas flow, which can cause fire or explosion. A properly filled cylinder will contain approximately eighty (80) percent of its volume as liquid LP-gas. This leave space for the liquid to expand and contract during temperature changes.

### **WARNING**

**PORTABLE FUEL-BURNING EQUIPMENT, INCLUDING WOOD AND CHARCOAL GRILLS AND STOVES, SHALL NOT BE USED INSIDE THE RECREATIONAL VEHICLE. THE USE OF THIS EQUIPMENT INSIDE THE RECREATIONAL VEHICLE MAY CAUSE FIRE OR ASPHYXIATION.**

### **WARNING**

**LP-GAS CONTAINERS SHALL NOT BE PLACED OR STORED INSIDE THE VEHICLE. LP-GAS CONTAINERS ARE EQUIPPED WITH SAFETY DEVICES THAT RELIEVE EXCESSIVE PRESSURE BY DISCHARGING GAS TO THE ATMOSPHERE. DO NOT BRING OR STORE GASOLINE OR OTHER FLAMMABLE PRODUCTS INSIDE THE RECREATIONAL VEHICLE BECAUSE A FIRE OR EXPLOSION MAY RESULT.**

**WARNING****IT IS NOT SAFE TO USE COOKING APPLIANCES FOR COMFORT HEATING!**

Cooking appliances need fresh air for safe operation. Before operation:

1. Open overhead vent or turn on the exhaust fan
2. Open a window.

This warning label has been located in the cooking area to remind the user to provide an adequate supply of fresh air for combustion. Unlike homes, the amount of oxygen supply is limited due to the size of the recreational vehicles, and proper ventilation when using the cooking appliance(s) will avoid dangers of asphyxiation. It is especially important that cooking appliances not be used for comfort heating as the danger of asphyxiation is greater when the appliance is used for long periods of time.

The following label has been placed inside the vehicle near the range area:

**IF YOU SMELL GAS:**

Extinguish any open flames, pilot lights, and all smoking materials.

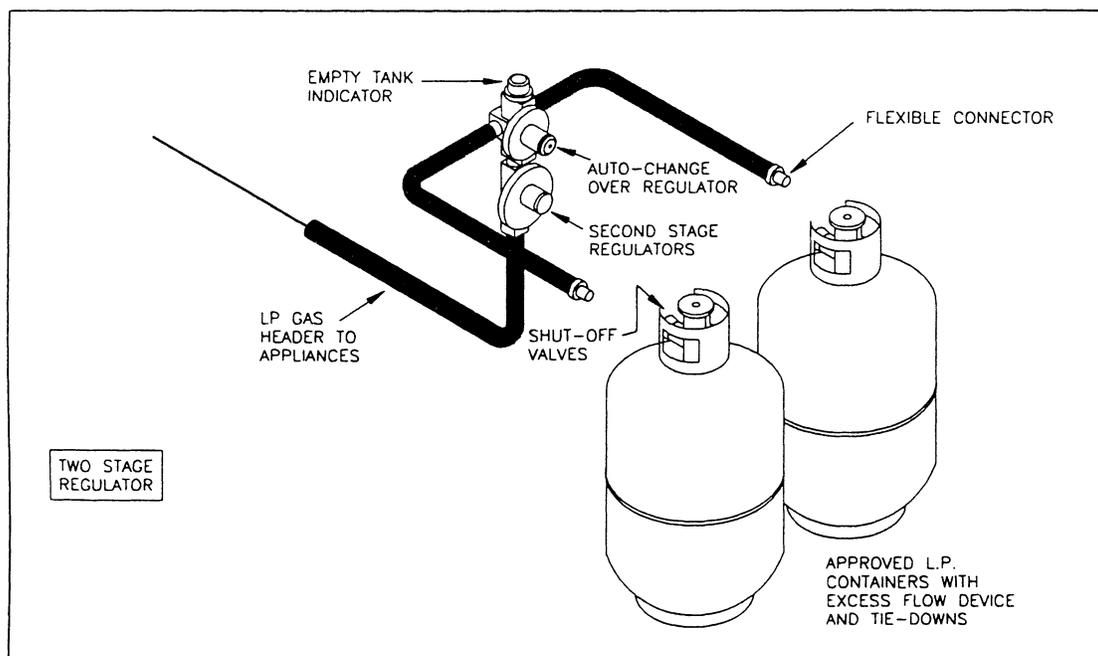
1. Do not touch electrical switches.
2. Shut off the gas supply at the tank valve(s) or gas supply connection.
3. Open doors and other ventilating openings.
4. Leave the area until the odor clears.
5. Have the gas system checked and leakage source corrected before using again.

**LP-Gas Safety Precautions** - Because LP-gas can be dangerous to use if not handled properly, some basic practices for safe usage of your LP-gas system are listed:

1. Never allow your LP-gas cylinder to be filled above the maximum safe level (80% of its capacity). Do not use a visible gauge for filling.
2. Do not use a wrench or pliers to close the POL service valve or fixed liquid level gauge on your cylinder. These valves are designed to be closed, leak-tight, by hand only. If wrenches are necessary to stop a leak, the valve needs repair or replacement.
3. When using the cylinder, open the valve all the way, then close 1/4 turn. This will enable you to determine whether the valve is open or closed.

4. When tightening the POL nut (left-hand thread) into the valve, draw it up snug with a proper wrench. Don't jam it. This is a machine male brass fitting which seats securely against a female seat in the POL valve - no pipe dope is necessary. Check for leaks after connecting. Apply soapy water to the connection, turn off all burners and pilots and watch for the appearance of bubbles. If bubbles appear, tighten the POL connector and repeat the leak test.
5. Check all cylinder and line connections for leaks each time you refill your propane.
6. Make certain your cylinders are properly fastened in place.
7. Under no circumstances should the LP-gas regulator be adjusted except by an authorized or licensed LP-gas service technician.
8. When you take your cylinder to a refill station, transport it in the proper position in which it is used, with the valves closed and POL plug inserted. Secure the tank against falling or rolling.
9. Since LP-gas is non-corrosive, you need not worry about the inside of your tank. However, the outside should be kept from rusting by a periodic coat of paint in a light reflective color. Pay special attention to the bottom. It is usually the first area to rust.
10. Practice safety at all times. If you have questions about the operation of your appliances or LP-gas system, contact your LP-gas dealer.
11. Do not store LP-gas cylinders indoors or in enclosed areas. Do not expose the LP-gas container to heat. Always store with cylinder valve closed and plugged.
12. Do not attempt to repair LP-gas containers, valves or regulators.
13. Never use an upright tank in a lay-down position.
14. It is recommended that your system be turned off at the tank while traveling.
15. If an odor of gas is present, do not light any of the appliances until the leak has been repaired.
16. For initial lighting of an LP appliance, it may be necessary to bleed the LP supply line of trapped air before the appliance will light. To do this, open one stovetop burner valve and hold a lighted match near the burner until it lights. The time will vary depending on the distance the appliance is located from the LP cylinder. Do not allow air to escape from the burner unless there is a lighted match present to ignite the propane gas when it arrives. **Never leave an open burner unattended. Provide ample ventilation during this procedure.**
17. Do not restrict access to the LP cylinder. In an emergency, the gas bottle valve must be easily accessible. Do not store items or block ventilation openings in LP compartments.

## Schematic of LP-Gas System



**Propane Leaks** - Propane gas is odorless, so an odorant has been added to aid in detecting leaks. If you smell gas follow the steps outlined in this manual in the section “**If You Smell Gas**”. Check for leaks with a solution of non-ammoniated, non-chlorinated soap. Apply this to each fitting connection. Open the cylinder service valve and look for bubbles at each fitting. Even tiny bubbles will require repairs be made by a qualified technician before using the gas system. **Never check for leaks using a flame or match.**

**Propane Leak Detector** - Propane gas is heavier than air so it will accumulate at the floor level. For this reason propane detectors are located at six (6) inches from the floor. Trailers that have an electronic propane detector will sound an alarm with flashing red LED in response to this accumulation. There must be twelve (12) volts power to the detector for it to operate. Check the ON indicator light to be sure your detector is functioning. Follow the manufacturer’s operating instructions for the proper use and testing. If the alarm sounds, follow the steps outlined in this manual in the section “**If You Smell Gas**”.

**Re-Filling Your LP-Gas Cylinder** - Overfilling is hazardous! Do not overfill your LP-gas cylinder. By law, cylinders can only be filled to 80% of the container capacity allowing 20% for expansion. LP-gas containers not equipped with a fixed liquid level gauge can only be filled by weight. Propane expands approximately 1.5% for each 10°F temperature rise. Only qualified personnel should fill your cylinder. Pumps do not stop filling “automatically”. If overfilled, excessive pressure could develop within the cylinder causing the relief valve to open, releasing propane to the atmosphere until a safe level is reached, at which time it will automatically close. Propane released through the safety relief valve is flammable and could cause a fire. LP-gas cylinders are available with visible gauges that display the amount of gas in the cylinder at all times, reading from full to empty. You can order cylinders with sight gauges from your dealer for an additional cost. Do not use visible gauges for filling.

**Use Vapor Only** - All LP-gas appliances for cooking, heating, lighting, water heating and refrigeration are designed to operate on LP-gas vapor only. Therefore, all LP-gas cylinders must be transported, installed and used in the proper position. Liquid propane that enters the system designed for vapor only creates a hazardous condition. Always use a POL plug when transporting or storing disconnected cylinders (full or empty). LP-gas cylinders are permanently marked with "arrows must point up" stamped in the guard to identify the proper position.

**LP-Gas Regulators** - LP-gas regulators reduce the pressure of LP-gas vapor from tank pressure to 6-1/4 oz. or 11" W.C. for use at the appliances. This is done through a two-stage regulator. A two-stage regulator greatly reduces the possibility of freeze-ups because the second stage regulator receives a relatively uniform pressure from the first stage regulator. This helps the second stage regulator to maintain appliance pressure at a nearly constant 11" W.C. because it does not have to adjust to varying inlet pressures. It is the heart of the LP-gas system and although it seldom requires service, care should be taken to protect it from the elements that could cause it to malfunction. In addition, your LP-gas system should be kept free of moisture that could cause regulator freeze-up. Installation of a good regulator enclosure will protect your regulator and anhydrous methanol injected into your LP-gas container will help to prevent freeze ups (one pint per gallon capacity). Always be sure that the regulator vent is pointing down with 45°.

**Automatic Change-Over Regulator** - A trailer or fifth wheel that has this regulator will switch automatically from the empty cylinder to the full one. The proper way to use this feature is to start with both cylinders full of propane. Open the valve on one cylinder first and turn the indicator arrow on the regulator so it points to that cylinder. Then open the valve on the second cylinder. The propane will only be drawn from the first cylinder. When that becomes close to empty the red "flag" under the glass dome of the regulator will start to rise. When the first cylinder is completely empty the red "flag" will be fully up and the regulator will switch over to the second cylinder that is still full. The flow of propane will be uninterrupted.

When you see that the red "flag" is up, turn the indicator arrow so it points to the second cylinder. This arrow does not turn automatically. It is only an indicator so you will know which cylinder is being used. You can now remove the empty cylinder and have it refilled. When the refilled cylinder is back in place, open its valve so it will be ready when the other cylinder empties. Remember to check all connections for leaks.

## **EXTERIOR EQUIPMENT**

**Awnings** - Your trailer is equipped (or can be) with a roll-up awning to provide shelter from the hot sun or light rain. It is designed to roll out safely and easily following the manufacturer's operating instructions. When you have it out, check that it is secure and that all adjustments are tight. Even in good weather you should set the lead bar so it is about twelve (12) inches lower at one end. This will allow rainwater to run off if the weather changes.

*Note: Some trailers have awnings that extend over slideouts, see decal on awning arm for instructions.*

Return the awning to its stowed position whenever you have advance warning of rain or high winds. However, never attempt this once the rain or wind has started. This is extremely dangerous. Instead, assure that one end is down enough to let the water run off and tighten all adjustment nuts. Wait until it is safe to roll up the awning.

When traveling, secure the awning according to the awning manufacturer's operating instructions. Ensure the travel locks on each arm are engaged, and that the roller latch is in the "ROLL UP" position. The bases of the arms must be securely engaged in their wall brackets. The awning fabric should be dry before it is rolled up. If it is rolled up wet, plan to roll it out to dry at the earliest opportunity. The fabric can be cleaned with mild soap. Rinse thoroughly.

**Stabilizer Jacks** - All of our slide-out model trailers and fifth wheels are equipped with stabilizer jacks. Bring the trailer close to level before setting these jacks. Drive your trailer tires onto blocks if necessary. The stabilizer jacks should carry enough weight to stop the trailer from shaking when you walk inside and to hold it in a level position. A level trailer is more comfortable to use and ensures efficient operation of the refrigerator and the water drainage systems. For your safety, the tires should not loose contact with the ground. Once the tires come off the ground the trailer is susceptible to falling sideways off the stabilizing jacks. The jacks will be damaged and possibly the trailer too. Use of the stabilizer jacks is an important requirement whenever the slide-out is being moved. The jacks reduce the chance of fatigue to the structure of your trailer or fifth wheel.

**Trailer Keys** - Entrance doors that have a dead bolt lock will have two different keys. Keep a spare set of these. The dealer can open the door lock with a master key but there are no master keys for dead bolt locks.

**Slide-Out Rooms** - Your trailer or fifth wheel must be leveled and stabilized first. Before moving the room out, check outside for trees, fences or other immovable objects within three (3) feet of the room. Check the interior for open doors or drawers or any loose objects. Keep people clear while the room is moving to prevent the possibility of personal injury. Never tow the trailer while the room is out, even for short distances. A separate paper of instructions is included with your trailer to outline the operation of the slide-out system used on your trailer. The room must be fully in or fully out to make a weather tight seal. Clear your slide-out roof of twigs and leaves when necessary to prevent damage to the rubber seals and sweeps.

**Fifth Wheel Landing Gear** - Insert the crank handle into the hole located on the left side of the fifth wheel. Both legs will lower as you turn this crank. To minimize the amount of cranking, lower the adjustable portion of the legs to the ground. There is a pin that must be removed to drop the leg. On some models a convenient snap pin has been installed. Always set the base or foot of the legs onto boards to prevent settling into the ground. Even pavement should be protected with a board. If your fifth wheel is equipped with electric landing gear be sure that the trailer battery is fully charged and properly connected. The motor switch is located inside a nearby trunk. The manual crank can still be used if the motor is unusable. Never operate the motor if the crank is engaged. Serious injury could result.

**Bug Rooms** - See separate operator's manual.

## APPLIANCES

All LP-gas appliances have lighting procedures on a plate that is permanently attached to the appliance. For further information, please refer to the specific manufacturer's manual included in your warranty package. All appliances are guaranteed by separate warranties from each of the manufacturers. Allow only qualified service personnel to work on your gas appliances.

**Refrigerator** - The gas/electric refrigerator operates on LP-gas or 120 volt AC electric power. The refrigerator will not operate properly if the trailer is not reasonably level. Check that the 120-volt cord at the rear of the refrigerator is plugged into the receptacle provided. This is accessed by removing the exterior vent door.

**Note: LP-gas should not be used for refrigeration while towing your trailer or fifth wheel.**

The exterior vent door and roof cap are designed to maximize the cooling of your refrigerator. Do not modify them in any way. Adding screens over these openings will reduce the airflow through the refrigerator compartment. The refrigerator will not cool properly if the airflow is restricted.

**Stove and Oven** - The burners and oven operate on LP-gas fuel. Refer to the separate manual for operating instructions and precautions. The top burners are not equipped with pilot flames. Each burner must be ignited before each use. This can be done using a match held close to the burner or with the electronic piezo igniter (if your range is so equipped).

The oven operates with a pilot flame. The oven control knob must be at the "Pilot ON" position and the flame must be lit by you. The gas will flow from the pilot orifice even if a flame is not present. If the oven is not being used for an extended period, the pilot flame should be extinguished by turning the oven control knob to the "OFF" position.

When your oven is used for the first time it will create smoke and fumes while it burns off the paints and oils used in the manufacturing process. This should only last about fifteen minutes. Open all windows and doors to ventilate the area. Avoid breathing these fumes.

**Furnace** - The furnace operates on LP-gas. Follow lighting instructions found in the manufacturer's operating instructions. Be sure all heat registers are open and the return air grill is unobstructed to prevent the furnace from cycling on its limit switch. Do not cover or modify the exhaust vent in any way. Unsafe operating conditions could result. Ensure the exterior furnace door is properly closed before operating the furnace. Do not store any items near the furnace. There must be a clear path for return air to get to the furnace circulation blower. When a return air grill is near a bed, watch that the blanket does not obstruct it.

When your furnace is used for the first time, smoke and fumes may be generated as the paints and oils used in the manufacture of the furnace are burned off. This should only take about fifteen minutes. Open all doors and windows to ventilate the trailer. Avoid breathing the fumes. Have your furnace inspected by a qualified serviceman at least once a year.

**Water Heater** - The water heater operates on LP-gas. Some models contain an optional direct spark ignition system (DSI) rather than a pilot light system. The lighted switch for the water heater is located in the kitchen area or bath vanity. Refer to the operating instructions manual for the water heater installed in your vehicle. Do not block or modify the ventilation openings in the door.

**Note:** Before lighting the water heater, make sure that it is filled with water. Heating an empty water heater will result in damage. If your trailer is equipped with a water heater by-pass kit, ensure that the by-pass is turned to “normal”.

If your trailer is equipped with an electric water heater, it will share the same circuit as the microwave oven. There is a toggle switch in the kitchen area that will direct the power to only one of these appliances at a time. There is also an on/off switch located near the water connections on the back of the water heater. This should always be off when the water heater is empty.

**Microwave** - Your trailer must be plugged into a 120-volt house current to operate the microwave oven. If the water heater in your trailer also operates on a 120 volt then these two appliances may share the same circuit. A toggle switch located near the microwave will control which appliance will get the power. Only one appliance will work at a time to prevent circuit overloading.

**Air Conditioner** - Many of our trailers and fifth wheels come with an air conditioner as standard equipment. On the rest it is an option that can be added at any time.

**Ducted Air** - Most trailers have air ducts in the ceiling to deliver air evenly throughout the trailer. The air registers are adjustable to point the airflow in any direction. These plastic grills can be easily removed for cleaning.

The return air grill at the air conditioner has an adjustable louver on the discharge side. This louver will deliver eighty (80) percent of the cold air into the living room when fully open. This feature is used when the trailer is very hot and you want rapid cooling of the living room area. Once the desired temperature is reached you can close the louver and send all the cool air through the ducts.

**Washer/Dryer Installation** - Some large fifth wheel models have a closet that will accept the installation of a washer and dryer. There is a compact combination washer and dryer available that is about 24” x 34” x 25” deep. It will leave the space in the top of the closet for linen storage. The closet is also tall enough to accept the Sears compact washer and separate compact electric dryer. In some models the closet front door frame must be moved out to increase the depth of the closet.

**Clothes Dryer Vent** - If your dryer is connected to an exterior vent, be sure to open a window or roof vent to allow air to enter the trailer. This is necessary to prevent negative air pressure inside the trailer. The closet door must be left open to provide sufficient flow of air through the dryer.

**Central Vacuum Cleaner** - This is an option available on many models. It operates on 120-volt power, so you must be plugged into park power to use it. The vacuum cleaner will start up as soon as the inlet door is lifted. Insert the hose into this inlet. The hose is long enough to reach all corners of the trailer from this location. Replace the bag contained inside the rectangular canister from time to time as required.

## **INTERIOR CARE**

Standard household products are generally all that are needed to keep your unit looking new. There are important exceptions, however, so read each section on cleaning very carefully. In all cases, avoid using abrasive cleansers or solvent-type cleaners. These products contain ingredients that can damage many kinds of interior finishes.

**Carpet** - Models with carpet will require frequent vacuuming to remove loose dirt and sand. Should the carpet become more deeply soiled, use a standard household carpet cleaner. For stains, first determine the specific kind of stain involved, and then refer to a later section on the removal of various types of stains from fabrics. Underpad is used to improve the durability of carpet in high traffic areas.

**Vinyl Flooring** - The vinyl floor is durable and will only need cleaning with warm water and a mild cleaner from time to time to maintain it. Avoid tracking dirt, sand or stones onto it. Sweep the floor often if your trailer is parked in a sandy area to prevent damage to this flooring surface.

**Hardwood Flooring** - The prefinished hardwood floor requires special care and attention. You must be careful to keep it dry and free of dirt and grit. Never clean your hardwood floor with water. Do not use any wax or cleaner that must be mixed with water such as Murphy's oil soap. Water can dull the finish and permanently damage the floor.

If your floor abuts exterior doors, put outside door mats at the entrance to keep dirt and moisture from being tracked in. Inside you may want to add an area rug to further prevent dirt and moisture from being tracked onto your hardwood floor. Don't use rubber, foam backed or plastic mats as they may discolor the floor.

Sweep or vacuum your floor as often as required to remove loose dirt or grit before it can scratch the surface of the floor. Wipe up spills as soon as possible, before they get sticky or dry. Remove dried spills with a cloth or scrub pad dampened with Clean 'n' Strip or Bruce Dura-Luster Cleaner.

A humidifier is recommended to prevent excessive shrinkage in wood floors due to low humidity levels. A humidity level of 44 - 45% is recommended.

**Cabinet Doors** - Many models contain natural wood oak doors. If your model contains these oak doors, care for them as you would a fine wood surface in your home. Apply a protective coating of furniture polish periodically to preserve the finish and use aerosol furniture polish for quick touch-ups. If cleaning becomes necessary, use a mild detergent solution on a soft cloth. Wipe with a clean damp cloth and then dry.

**Paneling and Cabinets** - Your wall paneling and many cabinets contain a vinyl-covered finish for durability and easy maintenance. Clean these surfaces with all-purpose household spray cleaner or mild detergent. Never use solvents or abrasive cleaners. Do not use large amounts of water. Use a damp cloth and dry the surface immediately.

**Fabrics** - Your recreational vehicle has a number of types of fabrics such as draperies and mattress materials. Draperies should be dry cleaned only. Even most careful spot cleaning will often leave residual marks in the fabric. Do not launder them. Check with your cleaner before having any fabric cleaned as rubber-backed fabrics can be damaged by dry cleaning.

On other fabrics, use a foam-type fabric cleaner whenever possible. If a stain is particularly greasy, solvent-type cleaning fluid may be used but directions for that product should be carefully followed. Since some solvent may damage foam cushions, insert a non-porous object such as a heavy coated cardboard between the seat cover and cushion while cleaning. Use solvent cleaners only with adequate ventilation.

For a complete cleaning, seat covers should be left on the respective foam cushions. If overall cleaning is necessary, have them dry cleaned by an upholstery firm. Do not launder this fabric as shrinkage may result.

**Stainless Steel Surfaces** - Household liquid detergent and water followed by thorough rinsing is all that is needed to care for stainless steel. After cleaning, wipe dry to prevent water spotting. For persistent stains, use a paste of mild powdered cleanser and water. Rub in the direction of the polish lines in the surface.

Never use scouring powder, scouring pads or steel wool. Also, avoid leaving salt, mustard, catsup or mayonnaise spills in contact with stainless steel. These can cause pitting of the surface. Fingerprints can be minimized by applying a light coating of household spray wax after the surface has been cleaned. Rust stains on the stainless steel may be due to the iron content of the park water or by iron particles from some other source. The stainless steel surface itself does not rust. Remove rust stains carefully with a mildly abrasive cleanser.

**Countertops** - Formica-type high-pressure laminated countertops are used in many products. Fiberglass countertops are used in several kitchen and vanity counter applications. Both Formica-type and fiberglass surfaces should not be used as cutting boards nor should hot utensils be placed directly on them. Always use a pad under hot pots and pans. Clean these surfaces with mild soap and water, and coat with household spray wax to retain brightness.

**Range** - Cleaning the range and oven in your recreational vehicle is similar to cleaning your home range. The stovetop is removable for easy access to the area below the burners.

**Rangehood** - Clean the exhaust fan filter frequently to remove greasy deposits before they build up. Remove the filter by sliding it out of the retainer track and clean with a mild detergent solution and a soft brush.

**Refrigerator** - First, wash out the cabinet with a mild soap solution. Rinse with a second solution of baking soda and water to help deodorize the refrigerator. Buff lightly with a soft cloth. When the unit is not in use, be sure to wipe up food spills promptly.

Never use scouring powder, steel wool or solvent-type cleaners. These can scratch the cabinet and damage the door seals. When your RV is not in use, leave the refrigerator door(s) open and leave a cupful of baking soda inside to absorb any residual odors.

**Bathroom Components** - Major bathroom components on most models are made of durable fiberglass. To clean, use a mild detergent solution. For stubborn stains, an automotive liquid cleaner is ideal. Never use abrasive solvent cleaners, steel wool, ammonia or similar cleansers as these can scratch and dull the finish. Also, keep the floor area clean of sand and other abrasives to prevent scratches. To retain the original shine, apply a light coat of liquid automotive wax and buff with a soft dry cloth.

**Toilet** - To clean the standard marine toilet, use mild household cleaners. Special toilet bowl cleaners may be used but only if flushed completely through the holding tank in a short period of time. These are particularly strong cleaners and can damage the holding tank if not properly emptied.

## **EXTERIOR CARE**

**Aluminum Skin** - The exterior of your RV has a baked-on automotive-type enamel finish that is as easy as cleaning your car. We recommend that you periodically wash the exterior to retain its original luster and appearance. Wash with cold water or lukewarm water and a mild soap, but avoid chemical solvents, strong detergents, or abrasives. Rinse thoroughly with clean water, dry, wax and polish to preserve its gloss. **NEVER WAX DECALS.**

The insert rail, moldings, compartment frames, window frames and trim are aluminum and should be cleaned as recommended above. **DO NOT USE CHROME POLISH ON ALUMINUM SURFACES.** The chrome surfaces such as door handles, mirrors, and other trim will retain their brightness if cleaned with soap and water.

**Fiberglass Skin** - Some models feature a complete fiberglass exterior skin. Washing, waxing and polishing may be conducted in the same manner as for the aluminum exterior skin. Precautions should be taken in the use of strong detergents, solvents such as lacquer thinners and other harsh abrasives. Wash at least four (4) times each year. Waxing with a non-abrasive quality automotive wax is good practice, but not mandatory. Rubbing compounds should never be used. **NEVER WAX DECALS.**

**Rubber Roof** - You can wash this with normal household detergents. Rinse thoroughly afterwards. The rubber roof does not require annual coatings or sealants. If you puncture or cut the rubber it can be repaired or patched. Do not use petroleum-based sealants. Use only butyl-based products approved for use on rubber roofs. Repair kits and sealants are available through your dealer.

**\* CAUTION \* The roof is very slippery when wet. Though the rubber membrane material is quite inert and will resist weathering well, it will not withstand the actions of certain materials. Such materials include strong acid, acetone, fats, oils, grease, tree sap and most hydrocarbons.**

**Aluminum Roof** - Your aluminum roof has been installed with waterproof sealants at the seams and vents. To keep the roof in watertight condition, it is recommended that periodic applications of roof seal may be made. These products are available at RV supply stores.

**\* CAUTION \* The roof is very slippery when wet.**

**Exterior Doors** - A periodic application of a graphite lubricant to the hinge and lock mechanism is recommended to maintain smooth operation and resist freezing.

**Weather Sealing** - It is a good practice to inspect the entire exterior of the RV yearly for proper weather sealing around frames of all windows, doors, compartments, vents and moldings. Missing, dried-out or damaged caulking should be replaced immediately. This should be a part of your regular maintenance procedure.

**Vents, Doors, Screens** - In the event of damaged vents, vent pipes and bent or damaged compartment doors, it is a good practice to replace them at your earliest convenience. Lubricate all the hinges, locks, window mechanisms and springs periodically. Clean windows and window screens. Keep drain slots in window frames clear of debris.

**Exterior Lighting** - Before each trip, turn on your running lights and inspect all clearance lights, identification lights, marker lights, stop lights and turn signal lights. Replace burned light bulbs immediately. Keep all light lenses clean with soap and water.

## **STORAGE PREPARATION - COLD WEATHER**

Proper preparation of your trailer for winter storage is very important. Plan to winterize before the freezing temperatures come. Water left in the waterlines, pump, toilet or holding tanks can cause costly damage. Winterizing your trailer does not stop with draining the water however. Read through the following sections carefully to avoid problems next spring.

### **General Information**

- For interior and exterior storage preparation, follow suggestions outlined in Exterior Care and cleaning and Interior Care.
- Remove all objects subject to freezing such as canned goods, beverages, cleaning supplies, etc.
- Thoroughly clean the refrigerator and prop open the door(s) for ventilation and to prevent odors from developing.
- Remove the roof air conditioner filter. Clean and then replace it. You may further protect a roof air conditioner with a commercially available vinyl exterior cover.
- Check all roof seams for cracks and, if necessary, apply new sealants around vents and along seams. Rubber roofing requires butyl based sealants. Petroleum based sealants will damage the rubber.
- Put powdered graphite into all door locks and apply lubricant to all door hinges, inside and outside, to prevent freezing.

**Auxiliary Battery** - Batteries will self-discharge if not used for a period of time. You can slow this process down and bring your batteries through the winter by following simple precautions.

- Check the water levels and make sure the battery is fully charged.
- Disconnect the cables and coat the ends with petroleum jelly.
- The battery can be left in your trailer or may be stored in a cool dry place.
- Check the battery's charge condition monthly and bring it to full charge when necessary.

**Tires** - Sunlight and unchanging weight can damage tires. Ultraviolet rays promote dry rotting of the walls, so cover your tires. Steady weight creates weakened flat spots. Take the weight off your unit by jacking and using an approved jack stand. Decrease the air pressure to reduce stress.

**Appliance Vents** - Insects can be a problem when they make nests in your appliance vents. However, you must not modify these vents in any way. Unsafe conditions could result when operating the appliance. Even adding fly screen will adversely affect the design and function of the vent system.

To prevent insects or blowing snow entering, place foil over the exterior panels of the refrigerator and water heater. Similarly close off roof vents, ventilator fans and furnace vents. Cover the air conditioner with a tight fitting vinyl cover available from your trailer dealer.

**\* CAUTION \* Remove the vent covers before operating the appliances.**

**LP-Gas Systems Moisture Proofing** - Though the LP-gas system is almost immune to cold weather, moisture can freeze in the LP regulator vent. Also, moisture that may inadvertently enter the tank when the tank was disconnected can cause future problems with the LP-gas appliances. Don't take the chance. Have an LP-gas attendant put some anhydrous methanol in the cylinders to combat moisture. Cover the regulator to shield it from snow and rain. Also, wash the cylinder and check it for chipped paint. Touch-up as needed with a quality outdoor paint (not a dark color). Pay special attention to the bottom of the cylinder. This area generally rusts before the rest of the cylinder.

**Winterizing Your Water System with Air** - The most important task of winterization is protecting your unit's water and drainage system from freezing. The following method uses air blown through the lines to push water out.

1. Drain your fresh water tank.
2. Clean out your waste holding tanks.
3. Drain the water lines by opening the lowest outlet or drain in the system.
4. Drain the water heater by removing water heater drain plug and opening the pressure relief valve.
5. Remove the output line at the water pump. Turn the pump on and pump out any remaining water, possibly as much as a cupful. Use a towel to catch the water.
6. To blow out the lines, simply open all the faucets and apply air to the pump outlet line just removed.
7. Re-attach the output line to the pump now so you won't forget in the spring.
8. This procedure may not completely clear all water lines of moisture. We recommend that you introduce a potable, non-toxic recreational vehicle antifreeze into your water system.

#### **WARNING**

**USE ONLY NON-TOXIC ANTIFREEZE SPECIFICALLY DESIGNED AND RECOMMENDED FOR RECREATIONAL VEHICLES.**

**Winterizing Your Water System with Antifreeze** - The following procedure will satisfactorily prevent your water system from freezing by replacing the water with non-toxic antifreeze.

1. Set the water heater by-pass to by-pass (standard equipment on most of our models). Drain W/H.
2. Pour into the fresh water tank two (2) gallons of non-toxic antifreeze.
3. Turn on the water pump. Be sure all the lines are hooked up and the taps are closed.
4. Open each faucet until a change of water color is noted. This includes the shower, kitchen and outside drains under the trailer.
5. Run the toilet until a similar change in the water's color is noted.
6. See owner's manuals of other appliances (i.e. washer/dryer) for winterizing instructions.

7. It is important to get a little antifreeze into the water heater and through the water heater drain plug.
8. Finally, be sure that antifreeze has circulated through the entire water system and that antifreeze is in all "P" traps.
9. Turn the pump off and relieve the cold water line pressure by leaving the kitchen tap open.
10. Depress the "city pressure inlet" one-way valve to allow residual antifreeze to drain out.

**HELPFUL HINTS FOR THE NEW OWNER**

Your RV will give you a great deal of pleasure. To ensure safe operation, make sure you and your crew take time to study your Owner's Manual and the Appliance Manufacturer's Manuals. As you travel you will undoubtedly receive "tips" from veteran owners that will make your traveling even more enjoyable. Following are a few to get you started.

1. Remember to avoid low tree branches and low bridges.
2. Use manned toll gates as you will usually be charged one class more than for a car.
3. Showers can take a lot or a little water. Take (navy) "sea showers" by wetting down, turning off the water with the on/off button on the showerhead, soaping up, and then turning the water back on to rinse.
4. Nothing will single you out as a bad camper quicker than dumping sewage other than in an approved dump station.
5. For most effective air conditioning, keep out the sunlight, either direct rays or reflected, with the curtains to just about double the air conditioner's effectiveness. To air condition one part of the RV faster or more effectively, draw the isle divider curtain to reduce the amount of space to be cooled. Park in the shade wherever possible.
6. Many travelers find sleeping bags save much work when preparing for bed. In cold climates they even take less room than blankets and are more effective.
7. The door step is convenient but make sure that when you drive off you have it tucked up. It projects out from the body and it could be damaged scraping on curbs.
8. When in motion, be sure that the refrigerator door is securely closed. If you don't you are liable to hit a bump and food will be flying everywhere. Also, don't load the fridge too full and after a rough trip, open the door carefully so that you don't have food falling out.
9. It is a good idea to remove objects from places like the top of the dinette table and kitchen work areas when in motion, as they tend to slide off if the unit has to stop suddenly.
10. Plastic containers with tight-fitting caps are much better than carrying pierced containers of liquids such as milk and orange juice.
11. Since your unit is self-contained you will find stopping in out-of-the-way places such as service stations, shopping center parking lots, church yards or even a farmer's field will add variety to your trip. When camping on private property, always ask permission. Clean up your site when leaving and be sure to thank the owner. Help those who come after you.
12. During peak tour season and holidays, it is sometimes necessary to phone ahead and make reservations at the park where you plan to stop.
13. Carry a laundry bag for soiled clothing. Along the road you will find laundromats in practically every town. A short break at the laundromat could be a welcome relief from traveling while you freshen up for another week on the road.

14. Be careful not to leave any food stuffs, soap or odour-causing materials in your unit for any extensive period of time. Damp clothing, hunting gear, etc. should never be stored in closets or drawers. Always dry thoroughly before putting away.
15. If needed, a fire extinguisher can save your life. One has been included in your unit. Make sure it is always charged.
16. Try to make your last gas stop of the day a complete all-inclusive stop. Pick up groceries, newspapers and anything else that may be needed. Avoid having to leave your parking place after you arrive. You will have more time to relax that way.
17. Always taste the water before filling your tanks in an unfamiliar location. Some water contains salt or alkali, while in other areas the water has a sulphur taste. Never use a new hose for filling your tank. They leave a distinctive taste.

## **CONTROLLING MOISTURE**

You can reduce or eliminate interior moisture condensation during cold weather by taking the following steps:

**Ventilate with Outside Air** - Partially open one or more roof vents and one or more windows to provide controlled circulation of outside air into the interior. While this ventilation will increase furnace heating load, it will greatly reduce or eliminate water condensation.

**Note: Even when it is raining or snowing, ventilation air from outside will be far drier than interior air and will effectively reduce condensation.**

**Install Tight Fitting Storm Windows to Reduce or Eliminate Condensation on Window Glass** - The interior surface of the storm window will be at least twenty (20) degrees warmer, reducing moisture condensation. **DO NOT COVER THE EMERGENCY EXIT WINDOW.** This window must be left accessible at all times for emergency exit.

**Reduce Moisture Released Inside the Trailer** - Run the range vent fan when cooking and the bath vent fan, or open the bath vent, when bathing to carry water vapor out of the trailer. Avoid making steam from excessive boiling or use of hot water. Remove water or snow from shoes before entering to avoid soaking the carpet. Avoid drying overcoats or other clothes inside the trailer.

### **WARNING**

**DO NOT HEAT THE TRAILER INTERIOR WITH THE RANGE OR OVEN.**

In addition to the hazards of toxic fumes and oxygen depletion which makes heating by the range or oven very dangerous, open flames add moisture to the interior air, increasing condensation. Do not use an air humidifier inside the trailer. Water put into the air by the humidifier will increase condensation.

**Ventilate Closets and Cabinets** - During prolonged use in very cold weather, leave cabinet and closet doors partially open to warm and ventilate the interiors of storage compartments built against exterior walls. The airflow will warm the exterior wall surface, reducing or eliminating condensation and preventing possible ice formation.

## **EFFECTS OF PROLONGED OCCUPANCY**

Your trailer was designed for recreational use and short-term occupancy. It is not designed or intended to be used as permanent housing. Warranty protection may be limited if damage or deterioration is due to long-term occupancy. If you expect to occupy the trailer for an extended period, be prepared to deal with condensation and the humid conditions that may be encountered. The relatively small volume and tight construction of a modern recreational vehicle means that normal living activities of even a few occupants will lead to rapid saturation of air contained in the trailer, and the appearance of visible moisture, especially in cold weather. If you know the signs of excessive moisture and condensation, you can minimize their effects.

Just as moisture collects on the outside of a glass of cold water during humid weather, moisture can condense on the inside surfaces of your trailer during use in cold weather when humidity of the interior air is high. This condition is much greater in a recreational vehicle than in most houses due to the small size and tight construction of the vehicle which allows a quick build-up of high moisture levels in the inside air.

The air inside a recreational vehicle can contain a surprisingly large amount of water vapor. Estimates indicate that a family of four can vaporize up to three gallons of water daily through breathing, cooking, bathing and washing. Unless this water vapor is carried outside by ventilation, or condensed by a dehumidifier, it will condense on the inside of the windows and walls as moisture, or in cold weather as frost or ice. It may also condense out of sight into the walls or the ceiling where it will manifest itself as stained panels. Appearance of these conditions indicates a condensation problem.

**Install a Dehumidifier Appliance** - During prolonged, continuous use, a dehumidifying appliance may be more comfortable and effective in removing excess moisture from the interior air. While use of a dehumidifier is not a “cure-all” and ventilation, storm windows, and moisture reduction continue to be important, operation of the dehumidifier will reduce the amount of outside air needed for ventilation. Heating load on the furnace will be reduced, and the interior will be less drafty.

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