



Owner's Manual

CAPTIVA
Travel Trailer



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IMPORTANT SAFETY REGULATIONS PLEASE READ CAREFULLY

LP GAS SYSTEMS AND APPLIANCES

Coachmen Recreational Vehicles, LLC is required to furnish the following consumer information as provided by the National Fire Prevention Association and the American National Standards Institute. The information and warnings found here may also be found in other sections of this Owner's Manual. Please see sections titled "Liquid Petroleum Gas System" and "Appliances" for other safety and operating information.

WARNING!!!

THE LIGHTING FLASH WITH ARROWHEAD SYMBOL WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE USER TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" WITHIN THE PRODUCT'S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK TO PERSONS.

CAUTION!!!

THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE (SERVICING) INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE APPLIANCE.

WARNING!!!

LP gas containers shall not be placed or stored inside the vehicle. LP gas containers are equipped with safety devices which relieve excessive pressure by discharging gas to the atmosphere.

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 exhaust fan.
2. Open window

A warning label has been located in the cooking area to remind you 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 vehicle, and proper ventilation when using the cooking appliances(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.

WARNING!!!

Portable fuel-burning equipment, including wood and charcoal grills and stoves, must not be used inside the recreational vehicle. The use of this equipment inside the recreational vehicle may cause fires or asphyxiation.

"This vehicle may be equipped with one or more devices that record specific vehicle data. The type and amount of data recorded will vary depending on how the vehicle is equipped. Please refer to the owner's manual for your chassis for further information."



⚡ WARNING!!!

Do not bring or store LP gas containers, gasoline, or other flammable liquids inside the vehicle because a fire or explosion may result.

⚡ WARNING!!!

Do not bring or store LP gas containers, gasoline, or other flammable liquids inside the vehicle because a fire or explosion may result.

A warning label has been located near the LP gas container. This label reads:

DO NOT FILL CONTAINER(S) TO MORE THAN 80 % OF CAPACITY.

Overfilling the LP gas container can result in uncontrolled gas flow which can cause fire or explosion. A properly filled container will contain approximately 80 percent of its volume as liquid LP gas.

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

IF YOU SMELL GAS:

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

LP gas regulators must always be installed with the diaphragm vent facing downward. Regulators that are not in compartments have been equipped with a protective cover. Make sure that regulator vent faces downward and the cover is kept in place to minimize vent blockage which could result in excessive gas pressure causing fire or explosion.



WELCOME TO "RV'ING" BY COACHMEN

Your Travel Trailer was manufactured by Coachmen Recreational Vehicle Company, LLC.

Welcome to our growing family of satisfied RV owners. Hours of relaxation, adventure and enjoyment await you and your family in your new RV. It is our intention that with the help of this manual that you will be able to enjoy your purchase for many years.

This owner's manual has been prepared to help you and your family use and enjoy your new RV by providing basic instructions for the operation and maintenance of the appliances, accessories and RV systems. Please read it carefully and follow the instructions. Also read and follow the instructions contained in the appliance and accessory manufacturer's booklets provided with your RV.

If you have any questions regarding the operation, maintenance or service of your new RV, please contact your dealer or Coachmen Service Operations so we can assist you. Your complete satisfaction is of the utmost importance to us.

Operation and maintenance instructions regarding appliances in this manual were obtained from the manufacturer's booklets and are used with the permission of those various manufacturers. Coachmen RV reserves the right to present edited portions of these materials. However, for a full understanding of these appliances, we suggest that you review those materials separately.

We offer a variety of recreational vehicles with varied standard and optional equipment; therefore, certain descriptions in this manual may not apply to your RV. Ask your authorized dealer, or see the current brochure for information on the availability of standard and optional equipment.

Thank you for buying our product. The entire Coachmen RV family wishes you many safe and enjoyable journeys in your new RV.

Sincerely,

The Coachmen Service Operations Team

Note: Coachmen RV works year round to improve its products. As a result, all specifications and equipment are subject to change with out notice.

All information contained in this Owner's Manual is believed to be accurate at the time of publication; however, during the model year it may become necessary to make revisions and Coachmen RV reserves the right to make all such changes without notice.



INTRODUCTION

Congratulations on the purchase of your new recreational vehicle. We sincerely thank you for choosing our product. You'll find many useful tips for the basic operation and maintenance of your vehicle's systems and appliances in this owner's manual.

If you are a first-time RV'er, we want you to learn to operate your vehicle correctly and be able to use components, appliances and any optional equipment in the most efficient manner and with confidence. If you are a veteran RV'er, you know that things change and a quick review of this manual will bring you up to date on what's new.

We would recommend you take a short trip first. The experience you will gain from this will help make your future RV'ing more enjoyable. While there are many accessories available to complement the standard and optional equipment you've chosen for your Travel Trailer, you may wish to use your vehicle several times before you invest in these accessories. What may be a necessity for one RV'er could prove to be of no value to you. Remember, your dealer is always ready to help and advise you.

Note: Due to individual taste and optional floor plans offered, your vehicle may not have all of the components illustrated or described in this manual. Ask your dealer for details concerning the specifics of your Travel Trailer.

TAKING DELIVERY

Your recreational vehicle has been inspected by our factory personnel throughout the manufacturing process. Our final factory check by quality control inspectors is not the last one. Your dealer performs additional predelivery inspections and systems checks. They will also help you understand the Warranty and complete any necessary forms.

DEALER RESPONSIBILITIES:

1. Orienting the customer to the recreational vehicle's systems and components as well as their operation.
2. Insuring the customer receives a complete Owner's Packet with warranty cards and registrations for the recreational vehicle and for separately warranted products, including operation and maintenance instructions.
3. Review Limited Warranty provisions with the customer, stressing the coverage. Assist the customer in completing these forms if needed and request that the customer read all warranty information as soon as possible explaining any provisions not clearly understood.
4. Instruct the customer how to obtain local or out-of-town service for the recreational vehicle and its separately warranted components.

OWNER RESPONSIBILITIES

As a new recreational vehicle owner, you have the responsibility for regular and proper maintenance. This will help you avoid conditions arising from neglect and that are not covered by your Coachmen RV limited warranty. Maintenance services should be performed in accordance with this Owner's Manual and any other applicable manuals. As the owner, it is your responsibility and obligation to return the recreational vehicle to an authorized dealer for repairs and service.

Since the Authorized Dealer from whom you purchased your new recreational vehicle is responsible for its proper servicing before delivery and has an interest in your continued satisfaction, we recommend that inspection, warranty and maintenance services be performed by them.

OBTAINING SERVICE

Give thought to the appointment time....Monday and Friday are the busiest days at most dealerships. Therefore, try to make a mid week appointment whenever possible.



PREPARE FOR THE APPOINTMENT

Try to be as specific as possible with your concerns. You should show the dealer representative what your concerns are. All work may not be covered by warranty; discuss additional charges with the dealer representative. Keep a maintenance log of your vehicle's service history. This can often provide a clue to the current concern.

PREPARE A LIST

Prepare a written list of concerns or specific work you require to be done. It is important that the dealer representative understands what your concerns are.

BE REASONABLE WITH YOUR REQUESTS

Appointments are made according to the type of repair scheduled, and the amount of time needed to complete the repair. If you add items after the appointment is set, discuss the situation with your dealer representative and list your items in order of priority. Expect to make a second appointment for work not completed or for parts that may need to be ordered.

NO OFFENSE

Insurance requirements forbid the admission of customers to a service repair area.

INSPECT THE WORK PROPERLY

Inspect the completed repairs when you pick up your vehicle. Notify your dealer representative of any dissatisfaction.

IMPORTANT DOCUMENTS

Always carry your vehicle registration and insurance policy cards. If you lend your vehicle, it is best to give the borrower a notarized letter authorizing them to be in possession of the vehicle.

LICENSES

Vehicle licensing laws vary from state-to-state. Check with your state license bureau of the nearest licensing branch office for the requirements in your state.

INSURANCE

Consult your insurance agent about personal liability, property damage, collision, theft and personal property coverage for your new recreational vehicle. Always carry your insurance policy and/or card with you when you travel. Obtain current road maps and tourist information for each state you'll visit or drive through.



TOWING/HOOK-UP

Tow vehicle requirements:

If you plan to tow your RV with an automobile or truck you already own, you might wish to upgrade your vehicle by adding heavier-duty shocks, heavier ply tires, larger battery, larger alternator, etc. Contact your tow vehicle dealer to find out your vehicle's towing capacity. If you plan to purchase a new tow vehicle, be certain to tell your dealer the size and type of RV the vehicle will be towing. Some automotive manufactures publish brochures that discuss towing considerations. Ask your dealer how to obtain this information. To operate the electric brakes installed on your RV, a brake control system must be installed in your tow vehicle.

Engine size

The engine must have enough horsepower to handle the tow vehicle, passengers, the RV unit and all of its cargo. Most automotive manufacturers offer a trailer towing package that usually includes the following: larger alternator and battery, heavier-ply tires, side view mirrors, heavier electrical wiring and larger engine and transmission cooling systems. Consult your tow vehicle's owner's manual for specific recommendations for your particular vehicle.

Note: Use of heavier suspension components, springs, shocks, axles or heavier-ply tires does not increase the weight ratings printed on the tow vehicle's "certification" plate.

The Gross Axle Weight Rating (GAWR) of each axle is determined by the axle system components with the lowest weight-carrying capacity. To avoid overloading your vehicle, check the Gross Vehicle Weight Rating (GVWR) and the GAWR.

Hitch Selection

Hitch selection is important because it affects the towing and handling characteristics of your RV. Ask your dealer about the proper class and type of hitch for your unit. Sway control devices are available to reduce sway caused by crosswinds, other vehicles passing you or the RV tires dropping onto the shoulder of the road. You should discuss this option with your dealer.

Be certain your tow vehicle can carry the hitch weight. Depending on the weight of the hitch, a weight distributing hitch may be required. This type of hitch helps keep both the tow vehicle and the RV level by distributing part of the hitch weight forward to the tow vehicle's front axle and back to the trailer's axles. Your dealer will be able to advise you on this. The required hitch ball diameter is stamped on the trailer coupler. (2 5/16" is common) Read the information supplied by the hitch manufacturer to achieve the best possible performance.

HITCH TYPES (STANDARD)

Class	Type	Max.G.T.W.	Max. T.W.
I	Weight carrying	2000 lbs.	200 lbs.
II	Weight Carrying	3500 lbs.	300 lbs.
III	Weight Carrying	5000 lbs.	500 lbs.
IV	Weight distributing	10,000 lbs.	1000 lbs.
V	Weight distributing	14,000 lbs.	1700 lbs.

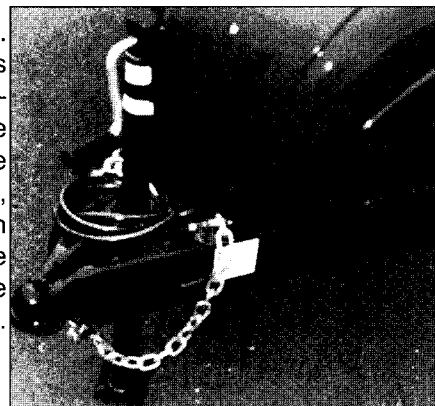
(G.T.W.=Gross Trailer Wt. T.W.=Tongue Wt.)

Note: Carrying capacities may vary by hitch manufacturer. The above chart is to be used as a guide only. Please consult the hitch manufacturer for more information concerning your specific needs.

The hitch ball height must also be set correctly so that the trailer is level once attached to the tow vehicle. Consult with your dealer for the correct hitch ball height or level the trailer and measure to the top of the hitch ball coupler. No matter which type of hitch you select, to insure maximum towing performance, the trailer must be level when attached to the tow vehicle.

Hooking up trailer to tow vehicle

Turn the front jack handle clockwise to raise the coupler above the hitch ball. Position the tow vehicle so that the hitch ball is directly under the coupler. (This may require someone to assist you until you are familiar with the proper positioning). Lift the hitch ball lock on the coupler and push all the way back. Lower the coupler onto the hitch ball by turning the jack handle counterclockwise until the coupler is fully seated on the hitch ball. Push the hitch ball lock back into place, making sure the lock is all the way down. You may also choose to purchase a pin or locking device that will keep the hitch ball lock in place. Continue turning the jack handle counterclockwise until the jack foot is off the ground. It then can be removed and stored. Continue raising the jack until the jack leg is all the way up.



Safety Chains/Pigtail

Cross the safety chains under the "A" frame and attach to the tow vehicle hitch platform, which must be firmly secured to the frame of the tow vehicle. Plug in the pigtail from the trailer into the tow vehicle's receptacle. Leave enough slack in the chains and pigtail to allow the unit to turn freely, but not enough so that they drag on the ground. Verify that all lights function on the trailer and tow vehicle.

Breakaway Switch

The breakaway switch is a safety device that activates the trailer brakes if the trailer is separated from the tow vehicle while being towed. Attach the cable to the tow vehicle at the hitch platform. Do not loop it around the hitch ball. Adjust the cable so that it pulls the pin out before the coupler drops onto the safety chains. Be sure to leave enough slack so that both vehicles turn freely without pulling the pin from the breakaway switch and that it does not get pinched between the hitch and coupler. Lubricate the pin periodically to ensure good separation. Be sure the pin is in place prior to each time the trailer is towed.

Note: DO NOT USE THE BREAKAWAY SWITCH AS A PARKING BRAKE. IT IS INTENDED FOR EMERGENCY USE ONLY.

Note: The tow vehicle battery will not supply power to the trailer brakes if a separation occurs. If the pigtail also disconnects, the trailer brakes will not work unless an RV battery has been installed. Keep batteries charged at all times to ensure safe operation.

Loading and Weight Determinations

Distribute your cargo evenly from side to side and from front to back. Load-leveling hitches are available; however you should rely on some experienced recommendations to determine if your trailer and tow vehicle are suitable for such a load leveling hitch. Heavier items should be stored in a central location, on or near the floor. They should be secured so they cannot slide during a sudden stop. Loose cargo can cause damage and alter your load balance. Lighter items can be stored in overhead cabinets or other areas. Experienced campers usually use plastic plates, cups, bowls, etc. as they are lighter in weight and do not break.



It is advisable to weigh your trailer before you leave on a trip. You can weigh your trailer at a grain elevator, sand or gravel pit or a government weigh station. Weigh your trailer loaded as you intend to use it. There may be a small fee for weighing your trailer, but it is an investment in safe traveling and peace of mind. Check the Gross Axle Weight Rating (GAWR) and the Gross Vehicle Weight Rating (GVWR) found on the Federal Sticker affixed to each trailer. The Federal Sticker lists the Trailer Serial Number, front and rear GAWR and the GVWR. Your tow vehicle has a similar sticker. The ratings listed on each sticker are for the specific wheel and tire size listed.

MFD. BY:		DATE:		
INC. VEH.		DATE:		
MFD. BY:		DATE:		
GAWR LB	TIRES	PSI COLD SINGLE	PSI COLD DUAL	RIMS
FRONT				
INTERMEDIATE				
REAR				
GVWR LB.		MODEL NUMBER		
TYPE		VEHICLE ID NUMBER		
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT IN:				

We suggest that you record the information off of the Federal Sticker in the space provide below to ensure that you always have the information close at hand.

GVWR _____ GAWR FRONT _____
 GAWR REAR _____ With _____ Tires
 RIMS _____ at _____ PSI COLD

Note: EXCEEDING THE GVW AND GAW RATINGS FOR YOUR TRAILER COULD RESULT IN SERIOUS DAMAGE TO THE SUSPENSION, FRAME OR OTHER COMPONENTS OF YOUR TRAILER AND VOID THE WARRANTY ON THOSE PARTS. USE OF HEAVIER SUSPENSION COMPONENTS (SPRINGS, SHOCKS, AXLES) OR HEAVIER PLY TIRES DOES NOT INCREASE THE WEIGHT RATINGS PRINTED ON ANY VEHICLE'S CERTIFICATION PLATE.

The GAWR of each axle is determined by the axle system components with the lowest weight carrying capacity. To avoid overloading your vehicle, check the GVWR and the GAWR.

WEIGHT DEFINITIONS

- GVWR—(Gross Vehicle Weight Rating) is the maximum permissible weight of the vehicle. The GVWR is equal to or greater that the sum of the Unloaded Vehicle Weight plus the Net Carrying Capacity.
- GAWR—(Gross Axle Weight Rating) is the allowable weight, including cargo, which can be safely supported by each axle.
- UVW—(Unloaded Vehicle Weight) is the weight of the trailer with no fluids, cargo optional equipment or accessories.
- HITCH WEIGHT—the weight at the hitch of this model with the unit sitting level. This weight includes typical options, but does not include the weights of full fresh water tank, holding tanks and LP bottles.
- CCC—(Cargo Carrying Capacity) is equal to the GVWR minus each of the following: UVW, the weight of the water in a full water tank and water heater and full LP gas.

Four Tire Weights

When possible, it is desirable to obtain the individual weights at each wheel. This requires using scales which are capable of measuring each tire weight individually (DOT Scales, for example). A tire weight should not exceed fi of the respective GAWR, or the maximum load rating listed on the tire, whichever is less. If any of the weights exceed these weights, relocate or redistribute a portion of the cargo until the weights are within the proper limits.



00705699

TOWABLE - UNIT WEIGHT INFORMATION SHEET

PRODUCT:

YEAR:

MODEL:

SER#:

- 7,410 LBS. 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.
- 4,413 LBS. UVW (UNLOADED VEHICLE WEIGHT)** is the weight of this trailer as manufactured at the factory. It includes all weight at the the trailer axle(s) and tongue or pin. 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.
- 2,997 LBS. NCC (NET CARRYING CAPACITY)** means the maximum weight of all persons, belongings, food, fresh water, LP Gas, tools, dealer installed accessories, etc., that can be carried by this trailer. NCC is equal to or less than GVWR minus UVW).
- 2,555 LBS. CCC (CARGO CARRYING CAPACITY)** is equal to the GVWR minus each of the following: UVW, full fresh (potable) water weight (including water heater), and full LP Gas weight.

**TOTAL WEIGHT ON AXLES SHOULD NOT EXCEED COMBINED AXLE RATING : 7,000 LBS.
DO NOT EXCEED 3,500 LBS. PER AXLE**

CARGO CARRYING CAPACITY (CCC) COMPUTATION:

	LBS.	(KG.)
GVWR.....	7,410	3,360.5
Minus UVW.....	4,413	2,001.3
Minus fresh water weight of 46.0 gallons @8.3 lb/gal (3.8kg/gal)..	382	174.8
Minus LP-Gas weight of 14.3 gallons @4.5 lb/gal (2kg/gal).....	60	28.6
CCC for this trailer*.....	2,555	1,158.7

*Dealer installed equipment will reduce CCC

OPTION WEIGHTS IN LBS. (Net weight added for manufacturer installed options)

PRONTO PACKAGE #1	54	SPARE TIRE	47
FAN, FANTASTIC	10	SINK COVER	3
SHOWER, OUTSIDE	2		

ALL WEIGHTS ARE APPROXIMATE and provided to assist the operator in the proper loading of this vehicle.

**CONSULT OWNER MANUAL(S) FOR SPECIFIC WEIGHING INSTRUCTIONS
AND TOWING GUIDELINES**

DRIVING

Get to know how your tow vehicle handles with the added weight of your travel trailer. The brakes and steering operation will be different. Before leaving on a trip, practice making right and left turns, braking, backing and accelerating. Your RV is designed to travel at maximum legal highway speeds under ideal conditions. Under less than ideal conditions, your vehicle should be operated at reduced speed and it should never exceed the posted legal speed limits. Before you travel be sure to read the PRE-TRAVEL CHECK in this manual.

Clearance

Be sure to read "Clearance Height" signs on overpasses, drive-through windows, etc. Watch out for overhanging tree branches, awnings or similar obstructions that can damage your vehicle's roof or roof mounted equipment and accessories. Check with your dealer for clearance measurements of your trailer.

Pulling into Traffic

Check for oncoming traffic in all directions. Signal before entering the flow of traffic. Always accelerate slowly and smoothly: The added weight of your RV makes quick acceleration not only difficult but potentially unsafe.

Passing

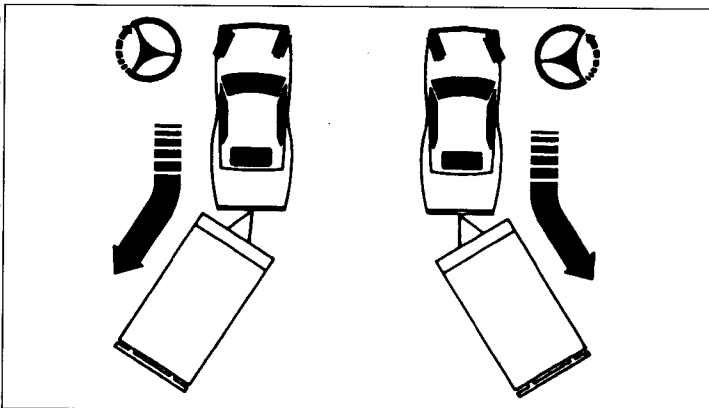
Avoid sudden maneuvers when passing a slower vehicle. Remember that additional time and distance are required to pass safely. Wait until the road is clear of oncoming traffic for at least five miles. Check the outside rear view mirrors and signal lane changes before passing other vehicles. When you have safe clearance, signal lane change and return to your original lane.

Braking

Allow a safe distance to stop; follow no closer than one combined tow vehicle/trailer length for each 10 MPH. A sudden stop may cause your vehicle to jackknife.

Backing your RV

It is very important that you back your RV slowly. Trying to maneuver the RV as you would in normal driving could cause the vehicle to jackknife, hit the tow vehicle or cause other damage. The same hazards could result from turning the wheels too sharply when backing or when driving normally. Backing the trailer may require stationing someone beside the trailer to guide the driver. When backing your RV, place your right or left hand at the bottom of the steering wheel. To move the trailer to the left, move your hand to the left; to move the trailer to the right, move your hand to the right. If the trailer starts to jackknife, stop, pull forward and start the procedure again. If you have never backed up a trailer before, practice backing up, or check with your dealer for techniques tips.



Swaying or Fish-tailing

If this happens while you are towing a trailer, accelerate slightly and then gradually slow down. You can also manually activate your electric brake controller without using the tow vehicle brakes. This will stop or reduce the swaying and or fishtailing. If your unit still sways, pull off the road and check the following:

- 1) Height of equalizer hitch
- 2) Distribution of cargo
- 3) Tire pressure
- 4) Tow vehicle front-end alignment and suspension



Turning

The wheels of your trailer are set wider than those of your tow vehicle. Pull several feet farther ahead than you would normally before turning. This will compensate for the extra width and length of your trailer and help you avoid hitting curbs or parked vehicles.

Downgrades/Upgrades

When going downhill, reduce your speed and shift the transmission to a lower gear to assist in braking on a long or steep downgrade. To avoid engine overheating when climbing a steep grade, reduce speed and shift the transmission to a lower gear.

Parking on a Grade

Parking vehicles on an upgrade or downgrade is not recommended. If it is necessary in an emergency, apply the brakes and have a passenger place wheel chocks on the downhill side of the tires of your trailer. When in place, slowly release the brakes until the trailer is stopped by the chocks. Apply the parking brake and shift transmission into park (place manual transmission into gear). Do not use the trailer brakes by pulling the breakaway switch pin. The trailer electric brakes are not designed as parking brakes.

Freeing a Stuck Vehicle

To pull your trailer out of the snow, sand or mud, apply slight pressure to the accelerator pedal and move the gear selector rhythmically between first gear and reverse gear. If possible, keep the front wheels of the tow vehicle pointed straight ahead. Avoid sharp turns. Once the trailer starts to move, do not stop until it is on firm ground.

LEVELING/CHOOSING A CAMPSITE

Campsite Selection

There are many campground guides that will assist you in making your selection. Most campgrounds accept reservations, and during peak seasons, it is wise to do so. If possible, arrive early enough so you can inspect and choose your campsite during daylight hours. During winter months, it is desirable to take advantage of natural windbreaks like trees, bushes or any similar type of windbreak. This will cut down the possibility of cold drafts that can affect the comfort level of your trailer.

Set Up

It is very important that your trailer is level. This allows your refrigerator and water drainage systems to operate properly as both function by gravity. To level your trailer, place a level on the bottom of the refrigerator's freezer compartment or on a normally level location inside the trailer. You may want to permanently attach levels, available at your dealer, on the front/back and sides of the trailer. This will allow you to see at a glance if you've stopped on a level site and will help speed up the leveling process.

Side to Side Leveling

If the trailer is not level from side to side, make step leveling ramps out of 1"x6" or 2"x6" boards of varying lengths. Place the ramps on the low side of the trailer in front of the tires and pull the unit forward onto the leveling ramps until the trailer is level from side to side. Most experienced RVer's carry leveling boards or blocks in their trailer for this purpose.

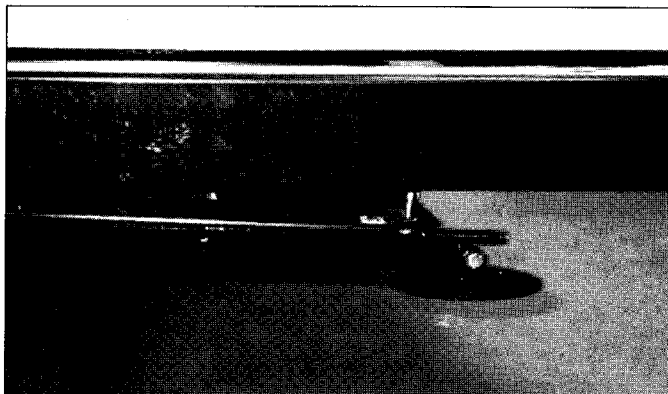
Front to Back Leveling

To level a trailer from front to back, prepare to unhitch the trailer from the tow vehicle by installing the jack foot and crank the jack down. Never rest the trailer on the front jack without the jack foot being installed or without a board under it. If the ground is soft, place a board under the jack foot. Disconnect the safety chains, pigtail and breakaway cable from the tow vehicle. Once the coupler is off of the hitch ball (using the front jack), pull the tow vehicle out of the way. Move the front jack up or down until the trailer is level.

Stabilizing the Trailer

Lower the stabilizer jacks one at a time until all have made contact with the ground. It is recommended that wood blocks be used under the stabilizer jack foot. Crank each jack 1 to 3 turns to stabilize the trailer.

Note: The stabilizer jacks are not designed for leveling the trailer. Such use will damage the stabilizer jacks and void any warranty coverage.



SLIDE ROOM OPERATION

Certain floor plans are equipped with slide out rooms. Your trailer may be equipped with one of the following:

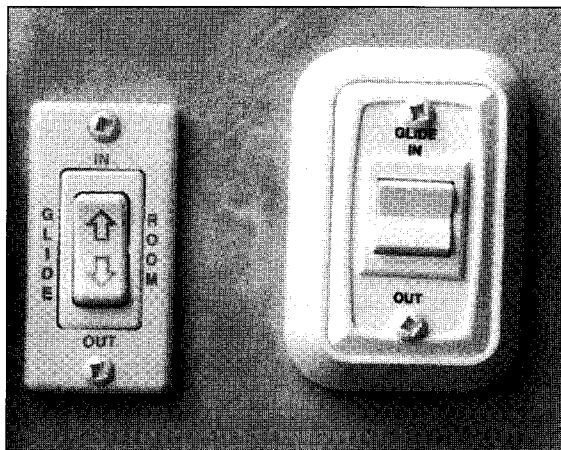
- Bed Slide
- Dinette Slide
- Dinette/Sofa Slide

Note: The trailer must be level and properly stabilized for proper room operation.

Before operating the slide room, be sure to remove any room locking devices that may be used, and check both inside and outside for any obstructions that may hinder room travel. The slide room is powered by 12 volts direct from the RV battery. If the room fails to operate, check the automatic resetting 12 volt circuit located by the battery.

To **extend** the room, push and hold the in/out switch (located near the room or the entrance door) in the out position until the room is fully extended. Release the switch.

To **retract** the room, push and hold the switch in the in position until the room is fully retracted. Release the switch.



IMPORTANT: Holding the switch after the room has reached the full extent of travel, either in or out, could result in damage to the mechanism or the structure of the trailer.



It is necessary to have a fully charged 12-volt RV battery installed on the trailer to electrically operate the slide room. The room will not operate without a battery even if the 110 volt shoreline is plugged in.

IMPORTANT: Before moving the trailer be sure to retract the room and reinstall any room locking devices.

In the event of total battery failure, the slide room can be manually operated. You can use a ratchet and socket to either extend or retract the slide room(s). It will be necessary to remove the padded bolster at the bottom of the slide room facer. There will be a hex head bolt at the slide motor. Turn the override clockwise to extend the room and counterclockwise to retract the room. (Some rear slide units may have an access to the override without having to remove the padded bolster.)

AIR QUALITY/LIVING AREA

CONDENSATION

Condensation is the process by which a gas or vapor is changed to liquid. This process occurs when there is too much moisture in the air and not enough air movement. It can be a problem in modern, tightly-constructed, well insulated RVs. Certain amounts of condensation should be expected, especially on cool surfaces such as windows, roof vents and metal door frames. However, excessive condensation can cause water damage to your RV and create the formation of mold or mildew.

Note: The prevention of mold and mildew is a maintenance issue and is your responsibility. Damages resulting from the formation of mold and mildew are not covered under the terms of the warranty.

Condensation can appear as fog, frost or ice on the inside of windows indicating that moisture is trying to escape to mix with drier air. It may also occur on paneling and ceiling panels where the aluminum studding is located. Other indicators of excessive moisture could be damp carpet, paint failure, mold or mildew, damage to furniture and damage to cabinetry. If any of these situations should occur, be sure to check all normal functions of your RV, such as plumbing, seals, windows and roof before assuming it is condensation. Just like your home, inspections and maintenance should be performed on a regular basis.

Keep in mind that your RV is a confined space and unlike a permanent dwelling, has limited venting capacity. Activities such as cooking, dish washing, cleaning and bathing add moisture to the air, so when performing these functions remember to keep your RV well ventilated to allow moisture to escape. By being aware of the causes, you may also be able to decrease the risks.

Your recreational vehicle was designed primarily for recreational use and short term occupancy, not a permanent dwelling. If you use your RV as a permanent dwelling or for prolonged periods of time, is more susceptible to the occurrence of condensation. The number of inhabitants and pets residing in your RV is also a factor, as breathing and perspiration are impossible to avoid but do add to the moisture content in your trailer.

If you intend to use your trailer for an extended period, be prepared to take steps to prevent condensation, mold or mildew. Prevention can be a scheduled event, on your time frame; an unexpected repair is not only inconvenient, but can be more costly.

CONTROLLING CONDENSATION

- **QUICK ACTION** – If leaks or spills occur indoors, clean them up quickly. In most cases mold and mildew do not grow if the area is dried within 24-48 hours.
- **REPAIR** – Regularly clean and repair any items installed on the roof. Check for debris or blockages in the vents. (If roof vents are properly maintained and sealed, yet you still have water dripping from the vents, it could be condensation.) Be sure all seals are tight, and check for loose screws or moldings.

- **LOWER THE HUMIDITY INSIDE YOUR TRAILER** - Keep indoor humidity below 60 percent relative humidity (ideally between 30-50 percent). Relative humidity can be measured with a humidity meter, available at most hardware stores. The meter is an inexpensive way to avoid the far more costly repairs of water damage.

Note: Even if it is raining or snowing, opening a vent for more air circulation will decrease moisture. Ventilated air from outside is drier than interior air.

REDUCING HUMIDITY LEVEL

- When bathing, open bathroom vent to allow steam and moisture to escape. There may also be a power vent in the bath which will increase the amount of moisture and humidity taken out of the trailer.
- Avoid hanging wet clothing inside to dry.
- Remove and dry wet shoes and rain gear. Avoid allowing them to air dry inside causing rain or snow to soak into carpeting or rugs.
- When cooking, avoid boiling. As an alternative, use the microwave when possible. Many items can be cooked in the microwave with minimal water.
- The use of a small oscillating fan may help reduce condensation by creating more air flow across surfaces susceptible to this condition.

Note: If you follow these guidelines and continue to have an excessive amount of moisture present, you may want to consider using a dehumidifier.

REMINDER: Left unchecked, these repairs could become very costly and this type of preventable damage is not warrantable.

TABLES /BEDS

Listed below are the general instructions for setting up the variety of tables and beds that may be found in your trailer. Your dealer will be happy to demonstrate these items.

Dinette Booth Assembly

The dinette booth assembly consists of two bench seats, four cushions and a collapsible/removable table. The table can be attached to the wall, or used as a freestanding table. It can also be set up outside. To lower the table into position for sleeping, lift up on the outside edge and lift off of the wall bracket. Fold the leg into the storage position and secure with the Velcro straps provided. Move the bottom cushions to allow the table to drop onto the supports provided. Lay the cushions flat for use as a bed.



Sofas/Beds

Several types of sofas are available, with the jackknife sofa being the most common. There may also be a hideabed sofa. Consult your dealer for proper instructions for the sofa in your trailer.

ELECTRICAL

12 VOLT AND 120 VOLT SYSTEMS

Your recreational vehicle contains two (2) separate electrical systems, one 12-volt direct current (DC) and one 120-volt alternating current (AC), similar to the one in your home. These systems provide you with power while you are camped or are traveling. The 120-volt system requires an external source of electricity, usually a campsite or household receptacle or an auxiliary generator. The 12-volt electrical system is supplied by the RV battery, the power converter or the battery of the tow vehicle.

To reduce the 12-volt load on your RV battery, the 120-volt system should be used whenever a 120-volt hook-up is available. Although most components in your trailer operate only from a 12-volt source, the power converter changes the 120-volt AC to 12-volt DC power.

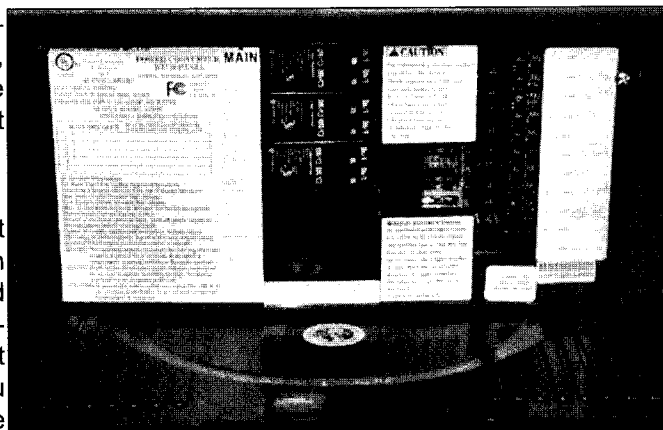
120-Volt System

The 120-volt system supplies power for the following through the power center:

Air conditioner	All Receptacles
Converter	Microwave
Refrigerator	Water Heater

The converter provides 12-volt power for all of the trailer's 12-volt components. When the external 120-volt shoreline is used, the power is connected directly into the main electrical service panel of the power center and is distributed through circuit breakers.

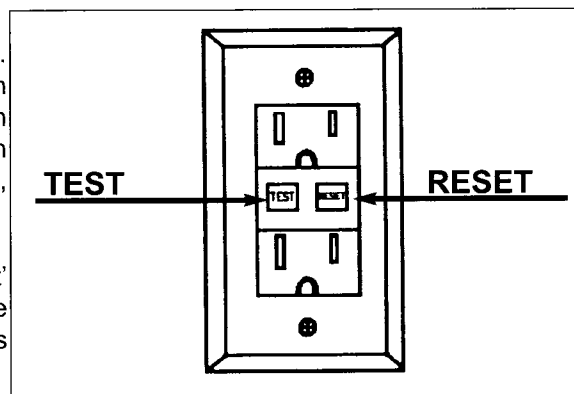
The circuit breakers are the protection devices for the 120-volt system. If a circuit breaker opens, unplug the appliance(s) on that circuit, allow a short period for the breaker to cool, and reset the breaker. The circuit breaker must be turned completely to the off position before it can be reset to 'on'. If the circuit breaker continues to trip, it may be caused by an appliance you have added or a fault in the electrical system. If you determine it to be a fault in the electrical system, please contact your dealer.



Ground Fault Interrupter/Receptacle

The majority of the 120-volt receptacles are ground fault protected. The ground fault receptacles are located in the kitchen and bath areas. In the event of a ground fault (normally a short between ground and the hot circuit) the GFI will trip and all receptacles down line of the GFI receptacle will not work. In the event that the GFI trips, unplug all appliances on that circuit and reset the GFI receptacle.

To test the GFI, plug in a test light into the outlet and push the 'test' button. The test light should go out. Push the 'reset' button to restore power. If the reset button does not pop out or the test light indicates a live circuit, contact your dealer for a more thorough investigation.





Shoreline Connection

The shoreline is a heavy-duty cable with a 3-prong grounding plug permanently attached at one end with the other end connected to the power center. It can be pulled from its storage compartment through a hatch in the sidewall of your trailer and connected to a matching receptacle (30 Amp Plug). If a 30 amp receptacle is not available, adapters can be purchased so the shoreline can be plugged into a 15/20 amp normal household receptacle. Never plug in the shoreline cable if the ground lug has been removed.

12-Volt System

The 12-volt system includes the automotive battery of the tow vehicle, the RV battery and the converter. To use the automotive battery the electrical pigtail must be plugged into the tow vehicle. This provides power to the exterior lights and brakes as well as all inside 12-volt appliances. The 110-volt shoreline must be plugged in to run the converter. The tow vehicle alternator will charge the RV battery when the pigtail is plugged in and the tow vehicle engine is running. When the 120-volt shoreline is plugged in the converter will charge the RV battery. The pigtail should be disconnected from the tow vehicle when the RV battery is in use.

The following items require 12 volt power, either direct from the battery or through the power converter:

All Interior Lights	Radio
C/O Detector	Range Vent
Furnace (ignition/blower)	Refrigerator
LP Leak Detector	Slide Out Room(s)
Monitor Panel	Television Antenna Booster
Porch Light	Trunk Lights
Power Roof Vent	Water Heater (ignition)
	Water Pump

Any item drawing power direct from the RV battery will have an inline circuit protection close to the battery location (slide out motor, for example).

Battery

Although not supplied with your trailer as original equipment, a battery is required to operate many of the systems. It is advisable that a heavy-duty RV/Marine battery be used. The liquid level in the battery must be above the plates. It should be checked frequently to avoid damage to the battery. The battery manufacturer recommends a good grade of drinking water (not mineral water). The battery terminals should be kept free of dirt and corrosion. The charge level of the battery should be checked periodically using a battery hydrometer. When the specific gravity is below 1.225, recharge the battery until the 1.265 level is indicated.

Converter

The power converter section of the power center transforms 120-volt AC into 12-volt DC to supply power to all of the 12-systems. Each 12-volt circuit is protected by an automotive type fuse. Open the door of the power center and check the fuses. A listing of the circuits is on the face of the panel. Some fuses protect circuits with more than one function, others may be for specific appliances. If a fuse is blown, turn off or unplug all appliances on the circuit controlled by the blown fuse. Replace the blown fuse with a fuse of the same ampere rating. If the fuse continues to blow, notify your dealer and arrange for repairs. Never replace a blown fuse with one of a higher ampere rating. See the power center manufacturer's owner/user guide for specifications, operation and testing procedures.

WATER SYSTEMS

Fresh Water System

Fresh water for your trailer is supplied either from the fresh water holding tank or by an external pressurized source (city water). The water heater is an LP gas appliance that heats water to a preset temperature. To fill the water heater, simply turn on a hot water faucet. When there is a steady flow of water, turn the faucet off. There are two common reasons for a failure to occur in the fresh water system. The first is a problem in the system itself: a hose, valve, coupling, road vibration effects, etc. The second most common cause of a system failure is neglect. Improper winterization, dirty filters, insufficient battery power and failure to perform proper maintenance will effect how your system operates. Most water system problems can be avoided by conscientious attention to these important details.

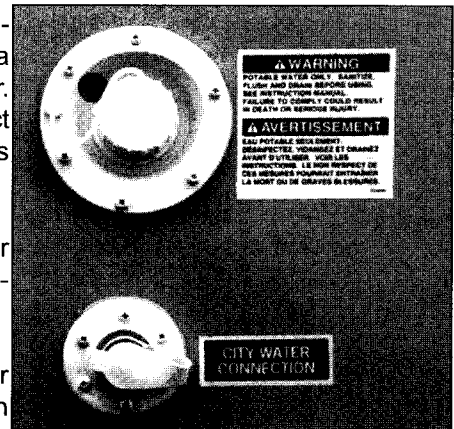
Leaks most often occur at a fitting. Vibration while traveling can cause fittings to loosen. Tighten fittings, taking care not to over tighten. If a leak continues, check for broken or cracked gaskets at the fitting. Proper winterization is a very important part of leak prevention. See section on winterization for additional information.

City Water

When using the city water hookup, the water tank and pump are bypassed. You cannot fill the fresh water holding tank through the city water inlet. Connect a hose to a 'city pressurized' water faucet and to the city water fill on the outside of the trailer. Although a common garden hose can be used to fill the fresh water tank and connect to city water, long-time RV'ers recommend a hose specifically manufactured for this purpose (Available from your dealer).

Note: In areas where city water pressure exceeds 60 psi, a pressure regulator should be used. Excessive water pressure may damage lines and connections. Consult your dealer for further details.

Once the hose is connected, simply turn on the water faucet. Make sure the water pump switch is turned off and open the faucets in your trailer to bleed off any air in the lines and water heater tank.



Fresh Water Holding Tank

The fresh water holding tank is filled from a gravity water fill located on the outside of the trailer. Use either a water hose or pour water from a container until the tank is full (water will flow back out the fill). Turn on the water pump switch and open a hot water faucet to fill the water heater tank. Once water flow is present at each faucet, turn off all faucets. The pump will shut off once the system is pressurized. When any faucet is opened the pump will turn on until the faucet is closed and the system is again pressurized.

To drain the fresh water holding tank, remove the plug in the end of the drain line that extends through the floor at the water tank location.

The fresh water holding tank should be sanitized before you use it for the first time, after a period of non-use and when you suspect the tank has been contaminated. To sanitize the tank, first empty the tank and use the following procedure:

1. Pour 2-1/2 cups of liquid household bleach along with approximately 10 gallons of water into the tank through the gravity fill.
2. Turn on the water pump and open the hot water faucet until water begins to flow. Turn off hot water faucet and repeat with the cold. Wait three hours.
3. Open faucets, line drains, water tank and water heater drains. Some solution will remain in the water heater.
4. Fill the tank to full level. Turn on the water pump and open all faucets. Let the water run until the system is empty. Connect a hose to the city water fill, turn on all faucets and let run for about five minutes.
5. If a chlorine taste lingers, flush the system with a vinegar and water solution (one quart vinegar to five gallons water). Turn on the water pump and open faucets until water flows. Wait two to three hours and flush with fresh water.



Water Pump

The water pump is a 12-volt DC appliance that is activated by a switch on the monitor panel. It is a demand pump, which allows you to leave the pump switch on while camping (if you are using the fresh water holding tank). The pump will shut off automatically when all the faucets and drains are shut and the system is pressurized. Once a faucet is opened, the pump will turn on automatically and run until the faucet is closed and the system is again pressurized.

- If the pump fails to start when the switch is on, check the fuse located in the power center/converter.
- If the pump continues to run whether the faucets are opened or closed, check the water level in the fresh water holding tank. Make sure the water heater tank has been filled and all air is bled out.
- If the pump runs sporadically, the tank may be empty or there may be a leak in the system.
- If water system pressure is low, the filter at the tank outlet or the filter in the pump may be plugged.

Note: If the city water is connected, the pump is not required and should be shut off.

Shower/Tub and Sinks

The faucet in the bath tub/shower utilizes a combination diverter/anti-siphon valve. To use the shower head, turn on the bath tub faucet until you have the desired water temperature. Simply pull up on the diverter valve where the shower hose is attached. Water will now come out of the shower head. Some units are equipped with a slightly different faucet, that has the shower hose attached to the under side of the faucet and has a diverter valve on the top of the faucet that you pull up for shower use. During your shower it is advisable to turn off the shower head to conserve hot water and avoid filling up the great water tank too quickly. The shut off on the shower head will not completely close off the water flow, but reduces it to a trickle. When you shut off the bath tub faucet, the diverter valve will close back to the faucet position. The anti-siphon is a safety device that prevents water from the tub to be siphoned back into the fresh water tank in the event you should drop the shower head into your bath water. The rest of the faucets will work the same as the ones in most homes. The outside shower does not include a faucet. Open the door and pull out the shower head and hose. Turn on the faucet and depress the handle on the shower head to turn on the shower head. Be sure to turn off the shower head and turn off the hot and cold valves.

Note: Do not use any type of abrasive cleaner or one that contains acid or lye on any of the sinks, bath tub or the tub surround. Any type of mild cleaner is sufficient and remember to rinse well.

Drainage/Sewer System

Your trailer is equipped with a drain system that functions much the same as the one in most homes. In most units, this system includes drain lines from the kitchen sink, bath sink and tub/shower to the gray water holding tank, and a RV type toilet which empties into the black water holding tank. Some units, due to code restrictions, may have more than the toilet empty into the black tank. There are also vents that carry odors out through the roof. The vents also equalize the air pressure which is necessary to maintain a water barrier against odors in the P-traps and to ensure smooth flow and escape for your drainage system.

Toilet

The toilet in your trailer is the Thetford Aqua Magic V (or one very similar). It is specifically designed as an RV toilet. To add water only to the bowl, press down on the foot pedal slightly. To flush the toilet, press the foot pedal all the way down. Flush the toilet before initial use and after emptying the black water holding tank. This will help to prevent the collection of solids. To help control odors, there are a number of toilet and holding tank treatment concentrates on the market. These chemical concentrates are available at your dealer. When cleaning the toilet, do not use highly concentrated or highly acidic household cleaners (no scouring powder). If the slide valve on the toilet does not move freely, apply silicone spray. To ensure proper operation and maintenance, refer to the manufacturer's operating manual.

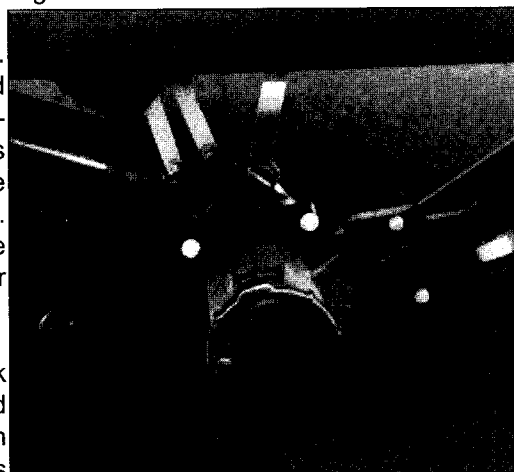
Holding Tanks

Your trailer will have two holding tanks as part of the drainage/sewage system, gray water and black water tanks. The gray tank collects water from the kitchen, bath sinks and the tub/shower. The black tank is used to collect waste from the toilet. Some units may have one of the sinks drain into the black tank to conform to certain plumbing codes and regulations. To prevent unnecessary accumulation of solids in the black tank, do not put facial tissues or similar products into the toilet. It is highly recommended that you only use bio-degradable toilet tissue available from your dealer. There are also tank chemicals available from your dealer that help break down solids and help prevent tank odors. It also helps prevent the buildup of solids in the tank by filling the bowl with additional water when flushing solids.

Holding tanks should be emptied frequently into a specified dumping station. Most campgrounds have either sewage hookups at the site, or a specified dumping station. Also, many highway rest areas have waste dumping stations. Before emptying the holding tanks, make sure your trailer is level as emptying the tanks depends on gravity. To empty the holding tanks, remove the sewage drain hose from its storage area (normally in the bumper). Remove the cap from the termination outlet and connect the drain hose. Place the other end of the hose in the proper receptacle either at the campsite or dumping station.

Open the black water tank valve (it will be the larger of the two). After the tank is empty, close the valve and pour about two gallons of water into the tank and drain again. This flushes the tank and helps clean the drain hose. Then open the gray water tank valve. When the tank is empty, close the valve. Always empty the black tank first as this helps clean out the valves and drain hose.

While you are camped you may leave the gray tank valve open only if connected and your campsite has a sewage hookup. Do not leave the black tank valve open. If the valve is left open, the rinse and flush water will run off and solids will be left to accumulate and harden on the bottom of the tank. After the tanks have been dumped, remove the drain hose, rinse it out and return it to its storage position. Reinstall the cap on the termination outlet.



LP Gas Systems

The liquefied petroleum (LP) gas system in your trailer furnishes fuel for hot water, heat, cooking and refrigeration.

LP gas provides a portable, efficient and inexpensive source of energy. It is stored in LP gas bottles on the front A-frame of the trailer. Under pressure in the tank, the liquid LP gas turns to a vapor, and that is what burns. All LP bottles supplied in today's market are equipped with an automatic 80 percent stop-fill valve that allows space in the tank for expansion and helps avoid overfilling the tank. The high pressure in the tank is reduced in two stages through a regulator. The tank pressure will vary with temperature and altitude. The pressure is reduced to about 12 psi in the first stage, then to about 6 1/2 ounces psi in the second stage (6 1/2 ounces psi is expressed as 11 inches of water column pressure).

No repairs or adjustments should be made to any part of the LP system except by an authorized dealer or service center. The LP system is designed and built to meet rigid standards, and it is tested before it leaves the factory. Your dealer also tests the system before the trailer is delivered to you. Your dealer is also responsible for filling and testing the LP bottles. Always have an authorized LP gas supplier fill your LP bottles. Be sure to use only liquid petroleum fuel in your LP bottle. Do not use butane or a butane mixture. Check with your LP gas supplier to be sure you are getting a pure quality LP gas. LP gas burns readily and with intense heat. With proper care and maintenance, it is a safe and efficient form of energy. There are, however, certain characteristics about LP gas you should know.

- If LP gas settles into any closed area, it displaces air and could cause suffocation if not detected.
 - It also could create a fire or explosion hazard if settled into a closed area.
 - In its natural state, LP gas is odorless. An additive gives it a distinctive mustard odor so that leaks can be readily detected.
- Under certain circumstances you may not be able to detect LP gas by smell.

For that reason, your trailer is equipped with an LP leak detector which will provide an audible warning if the presence of LP gas is detected. **NEVER DISABLE OR BYPASS THIS CRITICAL SAFETY DEVICE.**

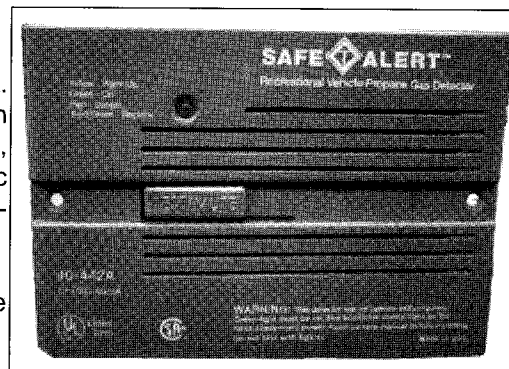
Should an LP gas leak be detected, do the following:

- Extinguish any open flames, pilot lights and all smoking material.
- Do not touch any electrical switches.
- Shut off the gas supply at the bottles.
- Open doors, windows and any other non-electrical ventilating openings.
- Leave the area until the odor clears.
- Call the local LP gas supplier, your dealer or authorized service center and have the LP gas system checked and repaired before using again.

LP Leak Detector

The LP leak detector in your trailer should be on whenever you are using it. The most important feature is an early warning alarm and a malfunction indicator. If LP gas concentrations reach a level of only 1/10 of the danger level, audio alarms and visual flashings are activated. There are also periodic tests for you to perform to insure safety. Be sure to read the manufacturer's instructions on use and maintenance.

Note: Do not spray any cleaning fluids or furniture polish on or near the detector.



Operating your LP Gas Appliances

To operate any LP gas appliance, the service valve on the LP bottle must be open, and there has to be LP gas in the bottle. When first used, or after a refill, there may be some air in the gas lines that will escape when you first open a range burner or similar gas valve. The air may extinguish your match or lighter the first time or two before you get ignition. The same will hold true for any automatic ignition appliance, such as the refrigerator. It may take several attempts at initial ignition before the burner actually ignites.

Remember, that when you close the LP bottle's service valve the lines remain full of LP gas. To completely bleed the lines of gas, light a range burner to use up the excess. When the flame burns out, turn off the range burner valve.

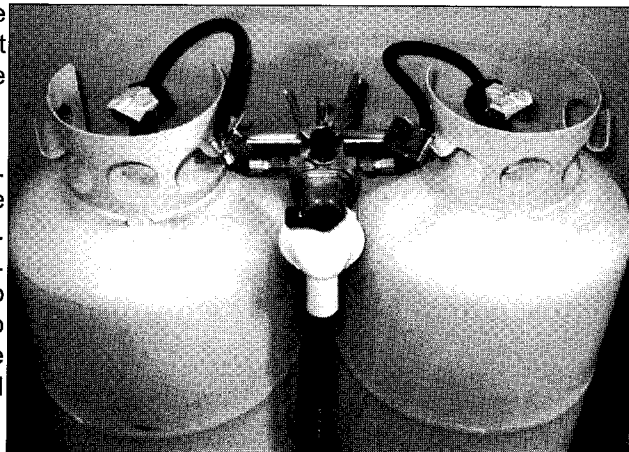
Climate Differences

An LP gas appliance will not function if the LP gas does not vaporize. Propane continues to vaporize down to -44 degrees F. Liquid does not vaporize as rapidly in cold weather, so you may place too great a demand on the bottle's capacity in certain conditions. This can cause a refrigeration effect resulting in regulator freeze-up. An LP bottle may also bleed off excess pressure if filled when cool and allowed to sit in extremely hot conditions due to the increased vaporization at higher temperatures. Check with your dealer or LP gas supplier regarding how your appliance demands may be met by the LP bottles at various temperatures.

Regulator

The gas pressure should be checked at the beginning of each season, after a repair involving the regulator or whenever a problem is indicated. Correct gas pressure is 11 inches of water column under a demand. Your dealer or LP gas supplier can perform this pressure check. LP regulators must always be installed with the diaphragm vent facing down and are equipped with a protective cover. Make sure that the cover is kept in place and that the vent faces down to help prevent blockage to the vent that could result in higher regulator pressure and cause a fire or explosion.

As part of the regulator, there is an automatic changeover valve. This allows you to open the service valves on both LP bottles. The bottle to which the service arrow is pointing is the one in service. The indicator at the top of the changeover valve will be green. Once the bottle is empty, the indicator will turn red and begin to draw off of the other bottle. At this time, turn the service arrow to the other LP bottle, turn off the service valve on the empty bottle and remove it for filling. Check the indicator frequently to avoid running completely out of fuel.





LP Gas Line Check

Regular maintenance of the LP gas system is extremely important to insure the system's safety. All checks and repairs should be performed by an authorized service agency that is trained in dealing with RV LP gas systems.

Note: DO NOT attempt repairs yourself. The system should be checked every 30 days of use or 5000 miles of travel. If you are using your trailer in rough terrain or traveling over rough roads these inspections should occur more frequently.

Note: If you check the connections for leaks yourself: DO NOT use an open flame or matches to check LP gas line connections. Use only an approved leak detector solution.

Note: DO NOT use products that contain ammonia or chlorine (most common household soaps). If you detect a leak, shut off the gas and contact either your dealer or nearest authorized LP gas supplier to have repairs made.

If you have any questions about your LP system, refer to an authorized dealer or licensed/certified LP repair facility.

1. DO NOT FILL YOUR LP BOTTLE BEYOND THE LEGAL LIQUID LEVEL CAPACITY.
2. NEVER USE A WRENCH OR PLIERS TO CLOSE THE SERVICE VALVE. THESE VALVES ARE DESIGNED TO BE CLOSED LEAK-TIGHT BY HAND. IF WRENCHES ARE NECESSARY TO STOP A LEAK, THE BOTTLE SHOULD BE REPLACED.
3. MAKE PERIODIC CHECKS FOR LEAKS IN THE BOTTLE AND LINE CONNECTIONS. VIBRATIONS DURING TRAVEL MAY CAUSE LEAKS. USE PROPANE GAS LEAK DETECTOR SOLUTION TO MAKE THESE CHECKS.
4. BE SURE TO FASTEN YOUR BOTTLES SECURELY IN PLACE.
5. TURN THE BOTTLES SO THE OPEN PART OF THE GUARD IS FACING THE TRAILER. THIS WILL PROTECT THE VALVE AND REGULATOR FROM FLYING ROCKS OR MUD.
6. DO NOT FILL YOUR LP BOTTLE BEYOND THE LEGAL LIQUID LEVEL CAPACITY.

WARNING!!!

WARNING!!!

WARNING!!!

WARNING!!!



DO NOT FILL BOTTLES TO MORE THAN 80% OF CAPACITY.

Over-filling the bottle can result in uncontrolled gas flow which can cause fire or explosion. A properly filled bottle will contain approximately 80% of its volume as liquid LP gas. The law requires all LP gas bottles to have automatic stop/fill valves which shut off the flow of LP gas once the 80% level is achieved. Do not use a bottle that does not have this safety device. DO NOT smoke, strike a match, or ignite a lighter when the LP gas bottle is being filled. A spark or flame could ignite the fumes. Be certain all burner and pilot lights are out and service valve is closed when filling your LP bottles or tow vehicle fuel tank.

APPLIANCES AND ACCESSORIES

Monitor Panel

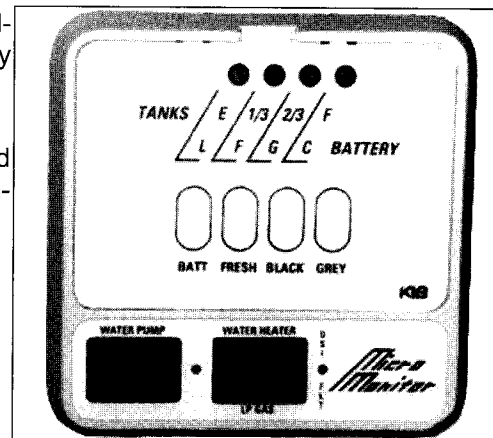
This panel allows you to check the condition of your RV battery and the volume of fresh, waste and grey water in your trailer's holding tanks. It may also house the switches for the water pump and the water heater.

Note: The panel illustrated is typical. The one in your trailer may look and function differently. Your dealer will be happy to explain the operation of your monitor panel.

Battery Condition Levels

The battery condition will fall into one of the following levels:

- C** CHARGED—14.5 volts or more.
Reading converter output or battery has dead cell.
- G** GOOD—12.6 to 14.49 volts
- F** FAIR—12.0 to 12.5 volts
- L** LOW—5.0 to 11.9 volts



The reading is an indication of the battery level only. For more specific readings you should test the specific gravity using a battery hydrometer. To obtain a battery level reading, unplug the shoreline and turn on two-three ceiling lights, as a discharged battery will show full charge unless electricity is being drawn.

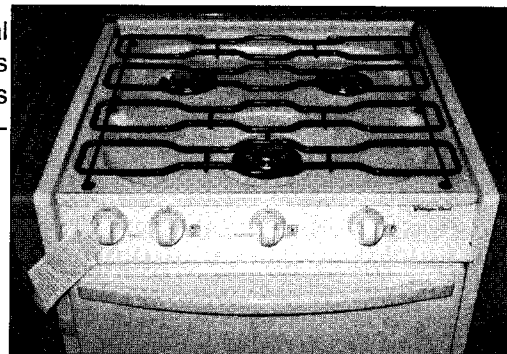
Range Hood

The light and fan of your power range hood are controlled by switches on the front of the hood. Use the fan to draw smoke, cooking fumes and steam/vapor out of the unit.

To clean the power hood filter, push the slot located in center front of screen and pull down. If not greasy, simply tap the filter to loosen and dislodge any debris. If the filter is greasy, wash in hot soapy water until grease dissolves. Allow the filter to drain and dry, then replace by positioning the flanges and push into place. Clean the plastic light cover in warm soapy water. Rinse well, dry and reinstall. Clean metal surfaces with warm soapy water and dry with a clean dry cloth to prevent streaking.

RANGE/OVEN

Your trailer is equipped with a three burner range, and there is an optional oven. A power range hood is also installed above the range. (Some trailers may incorporate the range hood into the microwave). The range burners and oven are LP gas appliances. Read the manufacturer's instruction manuals on the use care and maintenance of the range, oven and range hood.





WARNING!!!

Before operating your oven or range, open an overhead vent, window or turn on the range vent. Cooking appliances need fresh air for safe operation. **IT IS NOT SAFE TO USE COOKING APPLIANCES FOR COMFORT HEATING.**

WARNING!!!

WARNING!!!

This warning is to remind you 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 trailer. Proper ventilation when using the cooking appliance 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.

FAILURE TO FOLLOW THIS WARNING COULD RESULT IN EXPLOSION OR FIRE WHICH COULD CAUSE INJURY OR DEATH. FAILURE TO FOLLOW THIS WARNING WILL VOID ANY VEHICLE WARRANTY.

Lighting the Range

Be certain that the LP gas service valve is open. Light a match or lighting device and hold it close to the range burner. Turn the burner control knob to the full on position. Air in the line may blow out the match/lighter. When the line is free of air, the burner will readily light. Adjust the burner flame with the control knob. It is recommended that you use no larger than a 10 inch skillet.

Lighting the Range Pilot/Burner

To light the oven pilot, be certain the LP gas bottle service valve is open. Depress and turn the oven control knob to 'pilot on' position. Open the oven door and hold a match or lighter next to the pilot area (beneath oven bottom, on the left side of the burner). Hold the flame until the pilot flame is lit and stays lit after letting go of the oven control knob. Adjust the oven control knob to the desired temperature.

Reminder: The oven control knob must be in the PILOT ON position and held in for the pilot to be lit. Once lit, the pilot will continue to burn until the oven control knob is turned to off.

Care of Range and Oven

Allow the range to cool, then clean with hot soapy water. Use a damp cloth to clean chrome surfaces. Grease splatters, which may bake into the surfaces, should be wiped off before they have time to harden. Clean the oven with household oven cleaner after each trip, or as necessary. DO NOT apply cleaner to aluminum gas tubing, thermostat sensing bulb of electrical components.

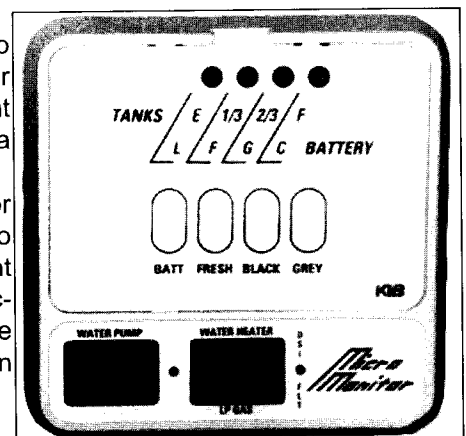
MICROWAVE OVEN

The microwave oven is a 120-volt appliance used to cook, defrost or simmer foods in less time than conventional cooking appliances. It may also contain a range light and fan. Be certain to read carefully the manufacturer's owner's manual for specific instructions on use and maintenance.

WATER HEATER

Your water heater is an LP gas appliance, which also requires 12-volt power to ignite the burner (automatic ignition). It is capable of heating 6 gallons of water to a preset temperature. Be sure the system has been purged of all air and that the water tank is full of water. This is done by opening a hot water faucet until a steady flow of water is achieved.

To light the water heater, turn the switch labeled 'heater', located on the monitor panel, to on. You should hear the water heater "sparking" while attempting to light. You will also hear the burner ignite. If the burner fails to ignite, the red light on the switch will illuminate, so the switch should be turned to off. Wait 5-10 seconds and turn switch to on. It may take more than one start attempt when the water heater is being used for the first time or after the LP gas bottle has been filled. To turn off the water heater, place the switch in the off position.



Electric Operation (optional)

Your trailer may be equipped with the optional gas/electric water heater. To operate the water heater on 110-volt AC, remove the water heater door on the outside of the trailer. The switch is located at the lower left and will have a safety pin installed to prevent it from being activated accidentally. Pull out the pin and turn switch to the on position.

The water heater tank must be full of water prior to operating either on gas or electric. Damage will result if operated without water in the tank which will not be covered under warranty.

Anode Protection

The water heater tank is protected from the corrosive action of hot water by an anode rod. The anode rod absorbs the corrosive action, and therefore will deteriorate over time. It is recommended that the rod be replaced annually. The anode rod is attached to the drain plug so it can be easily inspected when the tank is drained.

Draining the Water Heater

The water heater drain plug/anode rod is accessible by removing the exterior door of the water heater. Simply remove the plug, open the all faucets to facilitate draining, and reinstall the plug when water ceases to flow. A small amount of water will remain in the bottom of the tank.

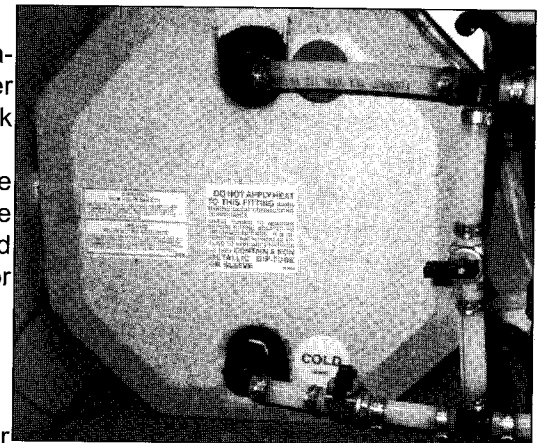
Care of Water Heater

Be certain the exterior compartment is clean and does not contain any combustible materials. Never obstruct the relief valve or exhaust vent. Periodically drain and flush the water heater tank. To flush the tank, connect a hose to the city water fill. Remove the drain plug/anode rod from the tank. Turn water on and let run for several minutes. Turn water off and reinstall drain plug.

Water Heater Bypass

Your trailer is equipped with a water heater bypass system, which is primarily used for winterization purposes, but will also allow you to use the water system without the water heater. The bypass system includes a check valve on the hot water outlet and two valves.

The water system should be drained and flushed before bypassing the water heater. For normal operation, close the center valve and open the valve at the bottom. To bypass the water heater, open the center valve and close the bottom one. Do not operate the water heater either on gas or electric when in the bypass mode.



WARNING!!

WARNING!!

WARNING!!!

Hydrogen gas can be produced in a hot water system served by a water heater that has not been used for a long period of time (generally two weeks or more).

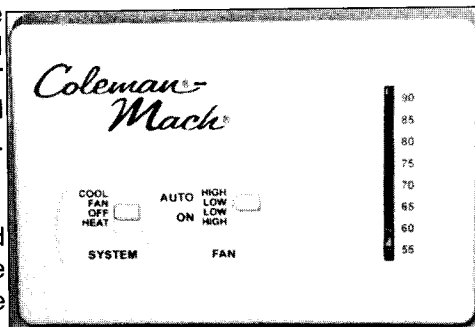
HYDROGEN GAS IS EXTREMELY FLAMMABLE. To reduce the risk of injury under these conditions, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any gas or electrical appliance. If hydrogen gas is present, there should be an unusual sound such as air escaping through the pipe as the water begins to flow. There should be no smoking or open flame near the faucet at the time it is open. Contact your dealer or the Viking customer service office if you are not certain of what action you should take.

FURNACE

The furnace is an automatic ignition gas appliance that is controlled by a wall thermostat. Heat is delivered through a floor duct system. Although the furnace's fuel source is LP gas, the blower and automatic ignition require 12-volt power (minimum of 9 volts).

Before lighting the furnace, be sure the LP gas bottle service valve is open. Turn the selector switch on the wall thermostat to the heat position. Set the thermostat to the desired temperature. An automatic relay in the furnace provides a time delay, so there will be a pause prior to the start up of the blower. At blower start up, the air at the ducts will be at room temperature. The furnace will start warming the air quickly and continue getting warmer for the next several minutes. If your trailer is cold throughout, it may take one or more hours to heat all interior walls, ceiling, floor and fixtures to a comfortable level. Once reached, the furnace will automatically maintain steady warmth. If the furnace does not ignite it may be due to air in the lines. Should this occur, turn the thermostat down to the lowest setting and turn the selector switch on the thermostat to 'off' and wait for the blower to shut off. After 30 seconds repeat the ignition process.

Note: If the furnace does not light after several attempts, while allowing each time for any delay pause, turn the thermostat off and contact your authorized dealer or service center. **DO NOT ATTEMPT TO REPAIR OR ADJUST THE FURNACE YOURSELF.** When changing your trailer's electrical source, as in from battery power to the shoreline, turn the thermostat off. This will help preserve the life of the furnace's electrical system.



Carefully read the furnace manufacturer's manual for other important Do's and Don'ts of service operation and maintenance. Preventative maintenance should be performed annually by an authorized dealer and should include cleaning of the heat exchanger, ducts and blower wheels to remove dust, lint or other foreign materials.

REFRIGERATOR

The refrigerator is a two-way (LP gas and 120-volt electricity) appliance. It is equipped with a control system, which can be set to automatically select either 120-volt or LP gas operation (auto mode), or if desired LP gas operation only. 12-volt DC power is required to operate the controls, and the refrigerator will continue to operate down to 9.6 volts DC.



WARNING!!!

WARNING!!!

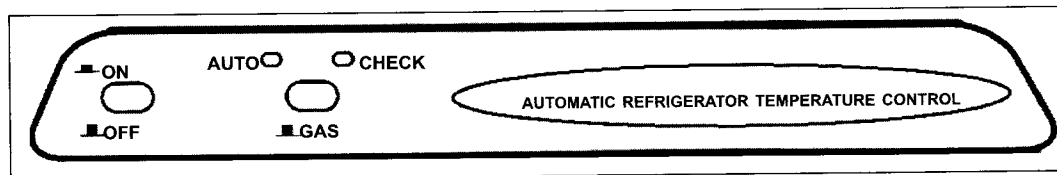
WARNING!!!

MOST LP GAS APPLIANCES USED IN RECREATIONAL VEHICLES ARE VENTED TO THE OUTSIDE OF THE VEHICLE. WHEN PARKED CLOSE TO A GASOLINE PUMP, IT IS POSSIBLE THAT GASOLINE FUMES COULD ENTER THIS TYPE OF APPLIANCE AND IGNITE FROM THE BURNER FLAME, CAUSING A FIRE OR EXPLOSION. FOR YOUR SAFETY, IT IS RECOMMENDED THAT ALL LP GAS APPLIANCES SHOULD BE SHUT OFF DURING REFUELING.

The refrigerator operates on the gravity flow of chemicals, so it must be level.

If you must stop on an uneven site for more than 30 minutes, turn the refrigerator off. Use a level in the freezer compartment to check levelness. Before starting on a trip, use the shoreline connection to cool the refrigerator the night before departing. Keep items to be used in the RV refrigerator in your home refrigerator or freezer until you are ready to depart. This will help the cooling load on the refrigerator and help keep perishable foods fresh longer. Always store food in sealable containers or suitable wrapping.

Note: Some states and municipalities do not allow operation of LP gas systems while the vehicle is in motion. If you have a question in this regard, check with local law enforcement authorities.



Start Up Instructions:

- A continuous supply of 12-DC power must be available for the electronic controls to function, and the LP gas bottle's service valve must be open.
- Press main power ON/OFF button ON, or in the DOWN position.
- Press the GAS button to the DOWN position. This allows the refrigerator to operate in the AUTO mode and the auto light should illuminate.



If the shoreline is plugged in, the refrigerator will operate in the 120-volt mode. If the shoreline is not plugged in, the refrigerator will operate off of LP gas. On initial start up, the burner may not ignite on gas due to air in the lines. In the event the burner does not ignite, the red CHECK light will illuminate. Simply turn the ON/OFF switch to off, wait several seconds, then turn switch back to ON.

If the check light continues to illuminate after several attempts, check to make sure the LP bottles are not empty and that the manual shut off valve at the rear of the refrigerator is turned on. If the problem is still not corrected, contact your authorized dealer for assistance.

Do not continue to reset gas operation after several attempts if the check light continues to be illuminated.

The refrigerator is equipped with a factory pre-set thermostat, and is not adjustable. It is also equipped with a climate control switch located on the top inside panel of the freezer door opening. It should be turned off unless you encounter high temperature/humidity conditions, and then only if the shoreline is plugged in. This climate control helps reduce condensation that forms around the doors when operated under these conditions. Because it operates on 12-volt power only, if operated only on battery power the RV battery will be drained in a matter of hours.

To operate the refrigerator on LP gas, and bypass the 120-volt mode, simply put the GAS switch in the UP position, and the refrigerator will operate on LP gas regardless if the shoreline is plugged in or not. To shut the refrigerator off, simply turn the ON/OFF switch to the UP position.

Care of Refrigerator

Remove food and ice after each trip. Clean interior with a lukewarm water and baking soda solution. The evaporator and shelves must, however, be cleaned with warm water only. Wipe dry with a soft, dry cloth. Never use strong chemicals or abrasives to clean the refrigerator as they can damage the plastic and aluminum surfaces.

If the refrigerator is not going to be used for a period of time, turn power off, empty and clean the interior and leave doors slightly ajar.

To defrost the refrigerator, remove food and ice. Turn power switch off and leave doors ajar. To speed up the defrosting process, fill a container with hot water and place on top shelf or in the freezer compartment. When all frost is gone, empty container and dry interior with a clean cloth. Do not use a hot air blower. Permanent damage could result from warping the metal and plastic parts. Do not use a knife, ice pick or any other sharp tool to remove ice/frost from the freezer compartment or evaporator. Punctures to the cooling unit could result which could cause a leak in the ammonia system.

ROOF AIR CONDITIONER

The roof air conditioner is a 120-volt appliance only. The shoreline must be plugged in to operate the air conditioner. It utilizes ducts in the ceiling to distribute the air flow throughout your trailer. The air flow can be regulated by opening or closing and rotating the vents. The controls are located on the thermostat that also controls the furnace.

To turn on the air conditioner, turn the control switch on the wall thermostat to the cool position, set the fan switch to auto high and set to the desired temperature. You will hear the air conditioner fan run and feel air out of the vents. It may take several minutes for the compressor to cool the air that is flowing out the vents. It may take up to several hours to cool down the interior of your trailer, depending on the outside temperature as well as the temperature of the interior of the trailer. Parking your trailer in a shaded area, keeping doors and windows closed and avoiding the use of heat producing appliances will increase the efficiency of the air conditioning unit.

The thermostat allows you the option of high or low fan operation for the roof air conditioner only. With the fan switch in the auto mode, the fan will cycle with the operation of the compressor. With the fan switch in the "ON" position, the fan runs continuously.

Roof Air Conditioner Maintenance

Little maintenance is required to keep your roof air conditioner in top operating form. Make sure the roof unit is clean of dirt, leaves and other debris that could effect the operation of the unit. The filter, located in the ceiling assembly on the inside of the trailer, should be cleaned at least every two weeks of operation. Remove the screws that secure the return air grill to the ceiling assembly. Lower the grill and remove the filter for cleaning or replacement. Operating the roof air conditioner with a clogged filter could result in a reduction of air flow volume or cause icing up of the evaporator coil resulting in a complete loss of cooling.

AWNING

Your trailer is equipped with an awning. It provides protection from light rain and bright sunshine. Properly used and maintained, your awning will provide years of trouble free operation.

Setting Up the Awning

- Loosen the black adjustment knob behind each arm.
- Push travel latch tab toward center of arm to disengage.
- Using the provided pull rod, reach up at the front edge of the awning tube and pull the locking lever forward (and down) to release the awning.
- Hook the rod into the loop of the pull strap and pull the awning all the way out.
- Slide rafter arm up until it snaps in place. Pull down and out on the sliding rafter to remove any slack from the fabric and tighten the black adjustment knob. Repeat procedure on the other arm.
- Slide the pull strap to the right (front) end of the tube and wrap it around the main arm.
- Pull up on the lift handle and raise the arm assembly to the desired height. Swing handle in and allow the lock button to snap into one of the holes. Repeat on the other arm.

Note: During rain, lower the end of the awning furthest from the entrance door to allow the water to flow off. Whenever heavy or prolonged rain or wind is anticipated, or you will leave the awning unattended, it is best to close the awning. Damage as a result of weather is not covered by warranty.

The awning can be used as a patio awning by pressing the release lever at the bottom end of the arm where it is attached to the wall of the trailer. Pull the arm assembly outward to a vertical position. Repeat on the other arm assembly. Drive stakes through holes in each patio foot into the ground.

Closing the Awning

- Pull stakes from ground and return arm assemblies to the holders on the side of trailer if used as a patio awning.
- Raise the lift handle to release the lock button. Lower main arm to the stop plug. Swing handle in to engage the lock button in a hole.
- Loosen black adjustment knob, lift the slider catch and slide rafter arm down to the bottom of the main arm. Leave black adjustment knob loose.
- Grasp the pull strap, after unrolling it from the arm, and pull toward you. (The spring tension must be released from the locking lever.) Flip the locking lever up to the roll up position. **Do not release the awning pull strap now!** The awning is under tension and could roll up and snap back against the side of the trailer.
- Slide the pull strap over to the center of the awning, and using the strap to control the speed, allow the awning to roll up back to the side of the trailer.
- Tighten the black adjustment knob and squeeze the rafter into the arm to engage latch. Awning is now ready for travel.

Care of the Awning

- Apply silicone spray lubricant as needed to keep the awning's moving parts operating smoothly.
- If the awning is wet when rolled up, as soon as conditions will allow, roll out awning let it dry before rolling back up. This will help prevent mildew and rotting.
- Mildew does not form on the fabric itself, but on accumulated dust, dirt and grime. Periodically clean the fabric using the following procedure:

1. Pour/cup of dish soap and/cup bleach into five gallons of water.
2. Soap the open awning with this mixture, and then roll up awning. This applies the mixture to the underside of the fabric.
3. After five minutes roll awning out and rinse thoroughly.
4. Repeat if needed and allow awning to dry before rolling back up. Apply silicone spray lubricant as needed to keep the awning's moving parts operating smoothly.

MISCELLANEOUS EQUIPMENT

There may be some optional equipment not covered in this manual due to changes in the available options, or features added after initial printing. Your dealer will be able to explain the operation of these features, or you can refer to the manufacturer's manual supplied with your trailer.



STORAGE AND WINTERIZATION

STORAGE

Consider using the following procedures if you will not be using your trailer for sixty days or more and when storing your trailer for a prolonged period of time.

Refrigerator

Remove all food from the refrigerator, defrost, wash and dry the inside. Prop the doors open for air circulation.

Cabinets

Check the staple foods in your cupboards and remove any that could be damaged by freezing, or that could attract vermin. Leave doors slightly ajar to prevent musty odors or mildew.

LP Gas

Close the service valves on the LP bottles. Extinguish all pilot lights. Light a range burner to consume any LP gas remaining in the lines. When the flame burns out, turn the range burner off.

Water Tank

To drain the water tank, turn on the pump and open all faucets. Open the drain fittings under the trailer for the water tank and water lines. When the tank is empty, turn pump off and close the faucets.

Water Heater

The water heater has a drain plug (which may also be the anode rod) which must be removed to drain the water heater tank. To facilitate draining, open all hot water faucets. When water stops flowing, replace the plug.

Holding Tanks

Make sure the Black Waste tank and Gray tank have been emptied into an approved dumping facility. Drain any remaining water that has accumulated during the draining of the fresh water system. Inspect the termination valve shafts and lubricate if needed. Make sure the valves are closed.

Electrical System

Turn off all 120-volt circuit breakers in the power center. Disconnect the battery and check to see that the battery is fully charged.

General

Close and secure all doors and windows. Cover windows with paper or cardboard to protect fabrics from fading. Slightly open a roof vent to allow air circulation, but not so far so that rain (or snow) can enter. Check under the trailer for any openings which would allow varmints to enter and seal as needed. Lower stabilizer jacks to prevent undue strain on frame. Lock all doors.

WINTERIZATION

Follow all the steps covered in the Storage section. Make special preparations for storing your trailer in cold winter climates. All systems and components should be inspected, and if necessary, repaired prior to storage. Be sure to winterize the trailer before removing the RV battery. Some additional recommendations for cold winter storage follow.

Fresh Water System

Make sure the water line and water tank drains have been reinstalled. Pour two gallons of non-toxic RV anti-freeze into the gravity water fill. Make sure the valves at the rear of the water heater are set to the 'bypass' position. Winterize the water system by turning on the water pump and briefly opening all faucets and flushing the toilet. Close faucets when anti-freeze flows out, making sure anti-freeze flows out the toilet, and turn pump off. Pour anti-freeze (non-toxic RV type) into sinks, shower/tub and toilet. Use enough in sinks and shower/tub to fill the p-traps. Use enough in the toilet to protect the termination system (1/2 gallon or so), and be sure there is a good flow of anti-freeze when the toilet is flushed.



Note: Do not use automotive anti-freeze in the water or sewage system. It is poisonous and also corrosive to sewage system components.

RV Battery

The RV battery should be removed and stored in a cool, dry place. Do not store battery in an area where possible exposure to extreme heat and cold, or sparks could occur. Be sure room is properly ventilated to dispel hydrogen gas fumes given off by the battery. Check regularly and recharge as needed.

LP Gas Regulator

Cover to keep moisture out of the vent.

Exterior Vents

Cover range hood, refrigerator, water heater and furnace vents with plastic or something similar. Inspect all roof vents and replace if needed. Caution: Prior to use be certain covers have been removed from all appliance vents.

Exterior

Clean and wax. Lubricate all locks and hinges. Inspect throughout winter months and remove any snow accumulation from the roof with long handled broom or something similar.

SAFETY FEATURES

Prevention is the best form of safety. Observe the same precautions in your RV as you do in your home. Use care with any open flame inside your trailer. Follow the instructions for the care, maintenance and operation of the various appliances in your trailer. Be sure everyone in your party is familiar with the emergency exits and location and operation of the fire extinguisher. It is recommended that you practice a fire drill periodically to ensure this knowledge.

CARBON MONOXIDE DETECTOR

Your trailer will be equipped with a carbon monoxide detector that is battery powered. You will need to replace the battery annually to insure proper operation. Remove the battery during winter storage.

LP LEAK DETECTOR

(Covered in section two under LP gas).

FIRE EXTINGUISHER

A chemical fire extinguisher is furnished with your trailer. It is located just inside the main entrance door. Check it regularly to be sure it is ready for use. Immediately replace a fire extinguisher that has been discharged or partially discharged.

SMOKE DETECTOR

The smoke detector is mounted to the ceiling and is operated by a battery. It should be tested periodically to ensure it is functioning and the battery should be replaced annually. Remove the battery during winter storage.

EMERGENCY EXITS

Windows that double as an 'emergency exit' will be marked by a label in large red letters. Handles that must be operated to open emergency exits will be colored red. Be sure that your dealer explains the location and operation of the emergency exits and that all members of your party are informed.

RV MAINTENANCE

RV owners are noted for the pride they take in the appearance of their units. Proper maintenance will do more than keep your trailer looking nice. It can help ensure trouble-free operation and maximum efficiency of the appliances and accessories. Failure to maintain the vehicle or its components may also constitute a breach of your warranty obligations. Just as an open window or an unrepaired leak in your home may lead to costly damage, the failure to repair leaks in your trailer or reseal your seams may result in serious damage. Read the various appliance and component manufacturer's manuals for specific maintenance information. Unless otherwise noted, maintenance functions should be performed at least annually. All maintenance schedules listed are the minimum requirement; heavy use, unusual temperatures or humidity, or other environmental conditions may require more frequent maintenance.



At the start of each season, or after a period of storage, thoroughly inspect and test all systems and components to be certain they are functioning properly. Airing of the unit is essential before you occupy it. See details under 'air quality and condensation' sections in this manual.

- **Automotive System**—Be sure to check your tow vehicle as outlined in the tow vehicle manufacturer's owners manual (lights, brakes, fluids, etc.).
- **Awning**—Apply silicone spray lubricant as needed to keep the awning's moving parts operating smoothly. Clean awning fabric as explained under 'Awning Care'.
- **Axles and Suspension** should be inspected frequently; paint and lubricate as needed.
- **Battery** should be inspected frequently and refilled or recharged as necessary. Battery cables and terminals should be checked and cleaned every 90 days.
- **Blinds and Valances** should be vacuumed or wiped off with a damp cloth.
- **Body** should be washed to remove dirt, dust, road tar, bird and tree droppings, insects and other foreign material from exterior surfaces. Apply an automotive-type wax at least twice a year.
- **Breakaway Switch, Pin and Cable** should be inspected after each trip. Make sure the pin can be pulled out of the switch and that the cable is not frayed or broken. If either exists, replace the breakaway switch assembly. Lubricate the pin.
- **Brakes** should be inspected and adjusted every six months and replaced as necessary.
- **Bumper and Frames** that are painted, or any exposed painted surface should be inspected for damage and rust. Rust should be removed and bumper and frame painted with a rust preventative paint.
- **Counter and Table Tops** should be cleaned with a mild detergent and warm water.
- **Cushion and Sofa material** should be vacuumed after each use. Spills should be wiped up immediately and cleaned with a mild detergent and warm water.
- **Draperies, Curtains and Bedspreads** should be dry cleaned only.
- **Electrical System** should be inspected and tested prior to each trip. Check the shoreline cord for damage to be sure the molded plug end is still attached to the cord. Test the 120-volt system for proper voltage and polarity. Your dealer will have line voltage and polarity testers that you can purchase.
- **Exterior Access Doors**—Lube the hinge and key locks periodically.
- **Floor Coverings** should be swept and cleaned with any type of linoleum flooring cleaner.
- **Furnace** should be maintained by the dealer only. Annual cleaning of the combustion chamber and blower wheel is recommended.
- **Hitch Ball/Pin** (latch and coupler) should be inspected prior to each trip and lubricated every 90 days.
- **Interior Drawers, Doors, Ceiling and Walls** should be wiped down with a mild detergent and warm water.
- **Jacks** should be inspected prior to each trip and lubricated every 90 days. Be sure to lubricate all moving parts on stabilizer jacks.



- **LP Gas System**—Be certain mounting supports for bottles secure. Check all connections at LP bottles. If you suspect a leak, make sure all appliances are turned off. Using an approved LP leak detector solution (products that contain ammonia or chlorine will damage the copper lines), check connections. Bubbles indicate a leak. Tighten connections and fittings using two open end wrenches until bubbles stop. If leak persists, contact your dealer.
- **Lug Nuts** should be checked after 10, 25, and 50 miles or whenever a wheel has been reinstalled. If lugs continue to loosen they should be replaced. Be certain to use the proper torque (90-95 ft. lbs.).
- **Pigtail Contacts** should be inspected and coated with WD-40 every 90 days.
- **Roof and Underbelly** should be inspected for damage, rust or corrosion every 90 days and repaired as needed. Rubber roof should be kept clean. The rubber manufacturer recommends that the rubber be cleaned at least 4 times a year with a mild detergent such as (409) mixed with water and a soft to medium bristle brush. Rinse thoroughly. Do not use harsh abrasives, general cleaners that contain petroleum solvents or citrus based cleaners.
- **Safety Chains** should be inspected for damage after each trip. Replace chains if they are damaged.
- **Seams and Joints** should be sealed around the roof, entrance doors, windows, roof and wall vents, access doors, luggage racks, ladders, TV antenna, awning rails and corner moldings at least once a year with a similar high-quality sealant. Inspect all seams and joints at least twice a year and reseal as needed. Be sure to use the same type of sealant that was used during the manufacturing of your trailer as some sealants will not stick to other types of sealants. Scrape or trim off any loose sealant and clean surface with mineral spirits prior to applying new sealant.
- **Sewage Termination Valves** should be sprayed with WD-40 periodically (especially the shafts).
- **Steps** should be lubricated every 30 days. Remove rust and repaint annually.
- **Tires** should be checked for damage after each trip. Prior to each trip the tires should be checked for proper inflation. Rotation is recommended annually (front to rear and rear to front only).
- **TV Antenna** exterior moving parts should be lubricated periodically.
- **Vents** should be inspected for damage and kept clean. Lightly lubricate any moving parts. Prior to each trip inspect vents (roof, plumbing, refrigerator, furnace and water heater for bird and insect nests).
- **Water Heater control compartment** should be kept free and clean of combustible materials and flammable liquids. The vent and combustion air grill must be clear of any obstructions. Manually operate the pressure relief valve once a year (only when the water is cool). Inspect the main burner flame to make sure it has the same color as new. Any differences in the color of the flame indicate a potential problem and should be addressed.
- **Wheel Bearings** should be cleaned and repacked once a year or every 5,000 miles.
- **Windows, Entrance and Access Doors** should be inspected for damage or leaks and repaired as needed after each trip. Clean dirt and debris from window tracks and lubricate moving parts, seals and tracks with silicone lubricant.



TRAVEL CHECK LIST

Suggestions of items to take for your comfort, convenience and safety:

TOOLS	CAMPING COMFORT	PERSONAL COMFORT
Screwdrivers	☐ Dish soap	☐ Towels
Pliers	☐ Dish cloth/towel	☐ Washcloths
Hammer	☐ Trash bags	☐ Sheets/pillow cases
Tire pressure gauge	☐ Mop/broom	☐ Pillows
Small level	☐ Dust pan	☐ Blankets/sleeping bags
Electrical tape	☐ Paper towels	☐ Toilet paper
Masking tape	☐ Plastic containers/bags	☐ Soap
Furnace duct tape	☐ Foil/plastic wrap	☐ Toothbrush
Allen wrenches	☐ Plastic dishware	☐ Personal toiletries
Hatchet	☐ Throw rug	☐ Scissors
Shovel	☐ Grilling utensils	☐ Sewing kit
Saw	☐ Fly swatter	☐ Small trash basket
12 volt Air pump	☐ Lawn chairs	☐ Bug spray
Flares	☐ Matches/lighter	☐ Sun block
Tow rope/chain	☐ Flashlight/batteries	☐ First aid kit
Reflectors	☐ Atlas	☐ Umbrella
Twine/rope	☐ Compass	☐ Candles
Utility knife	☐ Fire extinguisher	☐ Cooking utensils
Cordless drill	☐ Pen/paper	☐ Hot pads
	☐ Cooler	☐ Coat hangers
	☐ Garden hose	☐ Bucket
	☐ 110 volt extension cord	☐ Games/toys
	☐ 12 volt fuses	☐ Camera/film
	☐ Wheel shocks/blocks	☐ Binoculars
	☐ Jack stands	



PRE-TRAVEL CHECK LIST

GENERAL DRIVING CHECKS

For your safety, make certain that the following items have been inspected and rechecked before you take your travel trailer on the road (whether leaving from home or leaving a camping area). Make certain that all items inside your trailer are secured (lawn chairs, pots, pans, TV, etc). As you travel, these items, if not secured, may be damaged or damage the interior of your trailer.

- **Front Jacks**—Raise the front jack as far as possible.
- **Lights**—The following lights should be tested on both the trailer and tow vehicle: brake lights, warning lights, clearance lights, turn signals and tail lights. Clean all lens covers.
- **Hitch Coupler**—Make sure the hitch coupler is in the locked position and pinned. Make sure the safety chains and the breakaway switch cable is properly secured.
- **Rearview Mirrors**—Adjust the rearview mirrors so that the driver can see both sides of the trailer.
- **Shoreline Cord**—The 120-volt shoreline cord must be unplugged and placed in its compartment prior to travel.
- **Tire Change**—In the event of a flat or worn tire, turn on emergency flashers and pull off the road as far as safely possible. Set up flares or reflectors. Put a chock or block under the opposite side tire. Place a scissors-type or hydraulic jack on a block directly under the frame close to the tire that you need to change. DO NOT use a bumper jack, as it could damage the sidewall or floor assembly. Snug the jack up to the frame, and then loosen the lug nuts. Raise the jack until the tire is off the ground, then remove the lug nuts. Pull tire off; install spare and snug lug nuts. Lower jack and tighten lug nuts to specified torque setting. The lug nuts should be replaced after five tire changes as the nuts lose their self-locking feature after that many changes.
- **Water Hose**—Water hose must be removed from the city water fill prior to travel. Make sure the sewer hose has been disconnected and installed in the bumper storage prior to travel.
- **Wheel Lugs**—Wheel lugs must be tightened after 10, 25 and 50 miles on a new trailer and whenever a tire has been changed. Thereafter, check lugs after storage.

TROUBLESHOOTING GUIDE

Note: Use the product manufacturer's owner's manual for all appliance troubleshooting.

PROBLEM	CAUSE	SOLUTION
ELECTRICAL POWER No electrical power to unit.	1) Shoreline connection. 2) Circuit breakers may be tripped or off. 3) Battery cable loose or disconnected. 4) Circuit breaker at battery is bad.	Be sure the shoreline is plugged in and that there is power at the outlet. Reset circuit breakers at the panel. Clean and tighten battery cables. Replace 12-volt circuit breaker mounted on frame under battery.
POWER CENTER Converter making clicking noise.	1) Circuit overload. 2) Reversed polarity at battery. 3) Short in recharge line.	Reduce load on that circuit. Reverse battery cables. Locate and repair short.
ELECTRICALLY CHARGED (HOT) FRAME Frame is electrically charged.	1) Short in 120-volt circuit. 2) Shoreline cord not connected to earth ground. 3) Bad adapter plug.	Disconnect trailer from electrical supply. Have trailer inspected and repaired as needed by a qualified service facility. Note: Determine that shoreline has proper polarity. Make sure shoreline post ground is an earth ground and shoreline cord ground is used. Replace shoreline cord adapter.
LIGHTING Lights flicker.	1) Loose fuse holders. 2) Blown fuse. 3) Broken/loose wire or connection. 4) Bad ground. 5) Converter overheating.	Tighten fuse holder. Replace fuse with one of the same ampere rating. Replace connection or wire. Make sure frame ground is secure. Reduce load and let converter cool.

Lights dim or half bright	1) Possible converter malfunction. 2) Possible low voltage.	Have converter checked by an authorized service facility. Check voltage at outlet for shoreline and check battery specific gravity.
REFRIGERATOR Refrigerator will not cool.	1) RV not level. 2) Upper and/or lower vents obstructed. 3) If on gas, LP bottles empty. 4) No 12-volt power for refrigerator controls. 5) If on AUTO, no 120-volt power or heating element bad.	Make sure the trailer is level. Clear vents of debris, nests, etc. as air flow must not be restricted. Fill LP Bottles. Check fuse and replace. Check circuit breaker and reset.
SLIDE ROOM Slide room will not move when switch is activated.	1) No 12-volt power. 2) Battery is dead. 3) Motor malfunction.	Check auto-reset 12-volt circuit breaker at battery. Recharge or replace battery. Have checked by authorized service facility.
TV ANTENNA TV antenna has poor reception	1) Power booster not on. 2) Bad connection at TV or wall plate. 3) Cut or nicked cable. 4) Antenna not pointed in direction of station.	Turn on switch at power booster. Make sure all connections are good at TV and wall plate. Replace bad cable where needed. Rotate antenna for better reception.
TOWING Unit not level.	1) Hitch ball height not correct. 2) Unbalanced load. 3) Load leveling bars on hitch improperly adjusted.	Have hitch set up corrected by an authorized service center. Redistribute cargo. Adjust stabilizer bars for proper height.



WATER PUMP

Pump will not shut off.

1) Low water level.

Fill water tank

2) Air in system.

Bleed air out of water heater tank by opening faucets.

3) Faucet open.

Check exterior shower faucet.

Pump runs for several seconds without faucet opened.

1) Leak in system.

Locate and correct leak.

APPLIANCE IDENTIFICATION FORM

Should your trailer of one of the appliances require warranty service, you will have to identify the manufacturer, model and serial number. Fill in this form as soon as possible. It will help meet the identification requirement. Depending on your trailer, certain items listed below may be offered as either standard or optional equipment. Most of this information can be found on the Recreational Vehicle Data Sheet attached to the inside of one of the kitchen cabinets.

Equipment	Manufacturer	Model Designator	Serial Number
Travel Trailer			
Converter/Power Center			
Water Pump			
Furnace			
Keys-Main Door			
Exterior Storage			
Tow Vehicle			
Microwave			
Radio/Stereo			
Range/Oven			
Refrigerator			
Roof Air Conditioner			
Toilet			
TV Antenna			
Water Heater			
Other Items or Personal Items			



SPECIFICATIONS

LIGHT BULBS

Interior	Ceiling	141
	Range Vent	921
Exterior	Clearance	C194
	Porch	93/1003
	Tail Light	1157
	Turn/Brake	1157
	Scare Light	1156

PIGTAIL WIRING

Green	Running/Clearance lights
White	Ground
Red	Left Turn/Brake
Brown	Right Turn/Brake
Blue	Electric Brakes
Black	12-volt Battery/Recharge
Yellow	Back Up Lights (if equipped)

BATTERY WIRING

White	Ground
Black/Red	Positive

HITCH BALL HEIGHT

21 inches (verify with dealer prior to hitch installation)

OWNER'S MANUAL SUPPLEMENT

TIRE SAFETY INFORMATION



OWNER'S MANUAL SUPPLEMENT TIRE SAFETY

This portion of the Owner's Manual contains tire safety information as required by 49 CFR 575.6.

Section 1, based in part on the National Highway Traffic Safety Administration's Brochure entitled "Tire Safety- Everything Rides on It," contains the following items:

- Tire labeling, including a description and explanation of each marking on the tires, and information about the DOT Tire Identification Number (TIN).
- Recommended tire inflation pressure, including a description and explanation of:
 - A. Cold inflation pressure
 - B. Vehicle Placard and location on the vehicle
 - C. Adverse safety consequences of under inflation (including tire failure)
 - D. Measuring and adjusting air pressure for proper inflation
- Tire Care, including maintenance and safety practices.
- Vehicle load limits, including a description and explanation of the following items:
 - A. Locating and understanding the load limit information, total load capacity, and cargo capacity.
 - B. Calculating total and cargo capacities with varying seating configurations including quantitative examples showing/illustrating how the vehicles cargo and luggage capacity decreases as combined number and size of occupants' increases. This item is also discussed in Section 3.
 - C. Determining compatibility of tire and vehicle load capabilities.
 - D. Adverse safety consequences of overloading on handling and stopping on tires.

Section 2 contains "Steps for Determining Correct Load Limit"

Section 3 contains a Glossary of Tire Terminology, including "cold inflation pressure", "maximum inflation pressure", "recommended inflation pressure", and other non-technical terms.

SECTION I

The National Traffic Safety Administration (NHTSA) has published a brochure (DOT HS 809 361) that discusses all aspects of Tire Safety, as required by CFR 575.6. This brochure is reproduced in part below. It can be obtained and downloaded from NHTSA, free of charge, from the following web site:

http://www.nhtsa.dot.gov/cars/rules/TireSafety/ridesonit/tires_index.html

Studies of tire safety show that maintaining proper tire pressure, observing tire and vehicle load limits (not carrying more weight in your vehicle than your tires or vehicle can safely handle), avoiding road hazards, and inspecting tires for cuts, slashes, and other irregularities are the most important things you can do to avoid tire failure, such as tread separation or blowout and flat tires. These actions, along with other care and maintenance activities, can also:

- Improve vehicle handling
- Help protect you and others from avoidable breakdowns and accidents
- Improve fuel economy
- Increase the life of your tires.

This booklet presents a comprehensive overview of tire safety, including information on the following topics:

- Basic tire maintenance
- Uniform Tire Quality Grading System
- Fundamental characteristics of tires
- Tire safety tips.

Use this information to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

Safety First—Basic Tire Maintenance

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Underinflated tires and overloaded vehicles are a major cause of tire failure. Therefore, as mentioned above, to avoid flat tires and other types of tire failure, you should maintain proper tire pressure, observe tire and vehicle load limits, avoid road hazards, and regularly inspect your tires.

Finding Your Vehicle's Recommended Tire Pressure and Load Limits

Tire information placards and vehicle certification labels contain information on tires and load limits. These labels indicate the vehicle manufacturer's information including:

- Recommended tire size
- Recommended tire inflation pressure
- Vehicle capacity weight (VCW—the maximum occupant and cargo weight a vehicle is designed to carry)
- Front and rear gross axle weight ratings (GAWR—the maximum weight the axle systems are designed to carry).

Both placards and certification labels are permanently attached to the trailer on the forward half of the left side, and are easily readable from outside the vehicle without moving any part of the vehicle. You can also find the recommended tire pressure and load limit for your vehicle in the vehicle owner's manual.

Understanding Tire Pressure and Load Limits

Tire inflation pressure is the level of air in the tire that provides it with load-carrying capacity and affects the overall performance of the vehicle. The tire inflation pressure is a number that indicates the amount of air pressure—measured in pounds per square inch (psi)—a tire requires to be properly inflated. (You will also find this number on the vehicle information placard expressed in kilopascals (kPa), which is the metric measure used internationally.)

Vehicle manufacturers determine this number based on the vehicle's design load limit, that is, the greatest amount of weight a vehicle can safely carry and the vehicle's tire size. The proper tire pressure for your vehicle is referred to as the "recommended cold inflation pressure." (As you will read below, it is difficult to obtain the recommended tire pressure if your tires are not cold.)

Because tires are designed to be used on more than one type of vehicle, tire manufacturers list the "maximum permissible inflation pressure" on the tire sidewall. This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

Checking Tire Pressure

It is important to check your vehicle's tire pressure at least once a month for the following reasons:

- Most tires may naturally lose air over time.
- Tires can lose air suddenly if you drive over a pothole or other object or if you strike the curb when parking.
- With radial tires, it is usually not possible to determine underinflation by visual inspection.

For convenience, purchase a tire pressure gauge to keep in your vehicle. Gauges can be purchased at tire dealerships, auto supply stores, and other retail outlets.

The recommended tire inflation pressure that vehicle manufacturers provide reflects the proper psi when a tire is cold. The term cold does not relate to the outside temperature. Rather, a cold tire is one that has not been driven on for at least three hours. When you drive, your tires get warmer, causing the air pressure within them to increase. Therefore, to get an accurate tire pressure reading, you must measure tire pressure when the tires are cold or compensate for the extra pressure in warm tires.

Steps for Maintaining Proper Tire Pressure

- Step 1: Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owner's manual.
- Step 2: Record the tire pressure of all tires.

- Step 3: If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure.
- Step 4: If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.
- Step 5: At a service station, add the missing pounds of air pressure to each tire that is underinflated.
- Step 6: Check all the tires to make sure they have the same air pressure (except in cases in which the front and rear tires are supposed to have different amounts of pressure).

If you have been driving your vehicle and think that a tire is underinflated, fill it to the recommended cold inflation pressure indicated on your vehicle's tire information placard or certification label. While your tire may still be slightly underinflated due to the extra pounds of pressure in the warm tire, it is safer to drive with air pressure that is slightly lower than the vehicle manufacturer's recommended cold inflation pressure than to drive with a significantly underinflated tire. Since this is a temporary fix, don't forget to recheck and adjust the tire's pressure when you can obtain a cold reading.

Tire Size

To maintain tire safety, purchase new tires that are the same size as the vehicle's original tires or another size recommended by the manufacturer. Look at the tire information placard, the owner's manual, or the sidewall of the tire you are replacing to find this information. If you have any doubt about the correct size to choose, consult with the tire dealer.

Tire Tread

The tire tread provides the gripping action and traction that prevent your vehicle from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch. Tires have built-in treadwear indicators that let you know when it is time to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear "even" with the outside of the tread, it is time to replace your tires. Another method for checking tread depth is to place a penny in the tread with Lincoln's head upside down and facing you. If you can see the top of Lincoln's head, you are ready for new tires.

Tire Balance and Wheel Alignment

To avoid vibration or shaking of the vehicle when a tire rotates, the tire must be properly balanced. This balance is achieved by positioning weights on the wheel to counterbalance heavy spots on the wheel-and-tire assembly. A wheel alignment adjusts the angles of the wheels so that they are positioned correctly relative to the vehicle's frame. This adjustment maximizes the life of your tires. These adjustments require special equipment and should be performed by a qualified technician.

Tire Repair

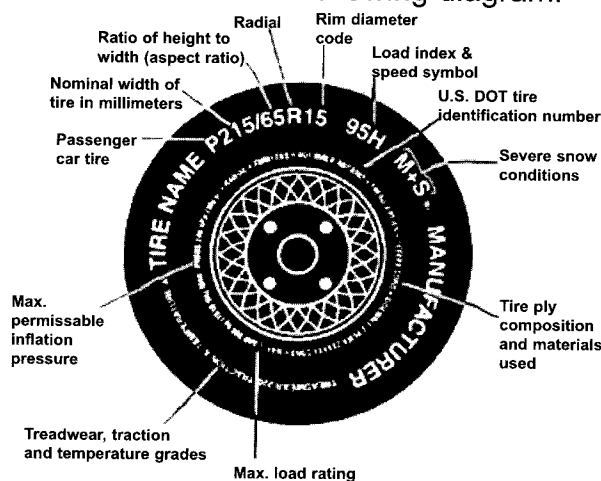
The proper repair of a punctured tire requires a plug for the hole and a patch for the area inside the tire that surrounds the puncture hole. Punctures through the tread can be repaired if they are not too large, but punctures to the sidewall should not be repaired. Tires must be removed from the rim to be properly inspected before being plugged and patched.

Tire Fundamentals

Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.

INFORMATION ON PASSENGER VEHICLE TIRES

Please refer to the following diagram.



P - The "P" indicates the tire is for passenger vehicles.

NOTE: Passenger car tires are not recommended for use on trailers, because the capacity ratings are not marked on the side walls of these tires. In the event a passenger car tire is used, the capacity must be derated by 10%.

Next number - This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

Next number - This two-digit number, known as the aspect ratio, gives the tire's ratio of height to width. Numbers of 70 or lower indicate a short sidewall for improved steering response and better overall handling on dry pavement.

R - The "R" stands for radial. Radial ply construction of tires has been the industry standard for the past 20 years.

Next number - This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

Next number - This two- or three-digit number is the tire's load index. It is a measurement of how much weight each tire can support. You may find this information in your owner's manual. If not, contact a local tire dealer. Note: You may not find this information on all tires because it is not required by law.

M+S - The "M+S" or "M/S" indicates that the tire has some mud and snow capability. Most radial tires have these markings.

Speed Rating - The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time. The ratings range from 99 miles per hour (mph) to 186 mph. These ratings are listed below.

NOTE: You may not find this information on all tires because it is not required by law.

Letter RatingQ
R
S
T
U
H
V
W
Y**Speed Rating**99 mph
106 mph
112 mph
118 mph
124 mph
130 mph
149 mph
168* mph
186* mph

* For tires with a maximum speed capability over 149 mph, tire manufacturers sometimes use the letters ZR. For those with a maximum speed capability over 186 mph, tire manufacturers always use the letters ZR.

U.S. DOT Tire Identification Number - This begins with the letters "DOT" and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code where it was manufactured, and the last four numbers represent the week and year the tire was built. For example, the numbers 3197 means the 31st week of 1997. The other numbers are marketing codes used at the manufacturer's discretion. This information is used to contact consumers if a tire defect requires a recall.

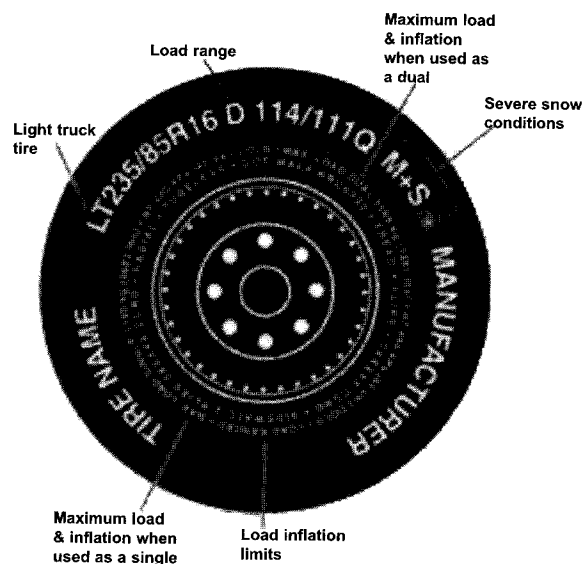
Tire Ply Composition and Materials Used - The number of plies indicates the number of layers of rubber-coated fabric in the tire. In general, the greater the number of plies, the more weight a tire can support. Tire manufacturers also must indicate the materials in the tire, which include steel, nylon, polyester, and others.

Maximum Load Rating - This number indicates the maximum load in kilograms and pounds that can be carried by the tire.

Maximum Permissible Inflation Pressure - This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

ADDITIONAL INFORMATION ON LIGHT TRUCK TIRES

Please refer to the following diagram.



Tires for light trucks have other markings besides those found on the sidewalls of passenger tires.

LT - The "LT" indicates the tire is for light trucks or trailers.

ST - An "ST" is an indication the tire is for trailer use only.

Max. Load Dual kg (lbs) at kPa (psi) Cold - This information indicates the maximum load and tire pressure when the tire is used as a dual; that is, when four tires are put on each rear axle (a total of six or more tires on the vehicle).

Max. Load Single kg (lbs) at kPa (psi) Cold - This information indicates the maximum load and tire pressure when the tire is used as a single.

Load Range - This information identifies the tire's load-carrying capabilities and its inflation limits.

Vehicle Load Limits

Determining the load limits of a vehicle includes more than understanding the load limits of the tires alone.

On a trailer, there is a Federal certification label that is located on the forward half of the left (road) side of the unit.

The certification label will indicate the vehicle's gross vehicle weight rating (GVWR). This is the most weight the fully loaded vehicle can weigh. It will also provide the gross axle weight rating (GAWR). This is the most a particular axle can weigh. If there are multiple axles, the GAWR of each axle will be provided.

In the same location as the certification label described above, there is a vehicle placard. This placard provides tire and loading information. In addition, this placard will show a statement regarding maximum cargo capacity.

Cargo Capacities

Cargo can be added to the vehicle, up to the maximum weight specified on the placard. The combined weight the cargo is provided as a single number. In any case, remember: the total weight of a fully loaded vehicle can not exceed the stated GVWR.

Water and propane also need to be considered. The weight of fully filled propane containers is considered part of the weight of the RV before it is loaded with cargo and is not considered part of the disposable cargo load. Water however, is a cargo weight and is treated as such. If there is a fresh water storage tank of 100 gallons, this tank when filled would weigh about 800 pounds. If more cargo is being transported, water can be off-loaded to keep the total amount of cargo added to the vehicle within the limits of the GVWR so as not to overload the vehicle. Understanding this flexibility will allow you, the owner, to make choices that fit your travel and camping needs.

When loading your cargo, be sure it is distributed evenly to prevent overloading front to back and side to side. Heavy items should be placed low and as close to the axle positions as reasonable. Too many items on one side may overload a tire. The best way to know the actual weight of the vehicle is to weigh it at a public scale. Talk to your RV dealer to discuss the weighing methods needed to capture the various weights related to the RV. This would include weights for the following: axles, wheels, hitch or pin (in the case of a trailer) and total weight.

How Overloading Affects Your RV and Tires

The results of overloading can have serious consequences for passenger safety. Too much weight on your vehicle's suspension system can cause spring, shock absorber, or brake failure, handling or steering problems, irregular tire wear, tire failure or other damage.

An overloaded vehicle is hard to drive and hard to stop. In cases of serious overloading, brakes can fail completely, particularly on steep hills. The load a tire will carry safely is a combination of the size of tire, its load range, and corresponding inflation pressure.

Excessive loads and/or underinflation cause tire overloading and, as a result, abnormal tire flexing occurs. This situation can generate an excessive amount of heat within the tire. Excessive heat may lead to tire failure.

It is the air pressure that enables a tire to support the load, so proper inflation is critical. Since RVs can be configured and loaded in many ways, air pressures must be determined from actual loads (determined by weighing) and taken from the load and inflation tables provided by the tire manufacturer. These air pressures may differ from those found on the certification label. However, they should never exceed the tire limitation for load or air pressure. If you discover that your tires cannot support the actual weights, the load will need to be lightened.

Tire Safety Tips

Preventing Tire Damage

- Slow down if you have to go over a pothole or other object in the road.
- Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.

Tire Safety Checklist

- Check tire pressure regularly (at least once a month), including the spare.
- Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma.
- Remove bits of glass and foreign objects wedged in the tread.
- Make sure your tire valves have valve caps.
- Check tire pressure before going on a long trip.
- Do not overload your vehicle. Check the Tire Information and Loading Placard or User's Manual for the maximum recommended load for the vehicle.

SECTION 2

STEPS FOR DETERMINING CORRECT LOAD LIMIT

1. Locate the statement "The combined weight of occupants and cargo should never exceed XXX lbs" on your vehicles placard.
2. Determine the combined weight of the driver and passengers that will be riding in your vehicle.
3. Subtract the combined weight of the driver and passengers from XXX kilograms or XXX pounds.

SECTION 3

GLOSSARY OF TIRE TERMINOLOGY

Accessory weight - The combined weight (in excess of those standard items which may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

Bead - The part of the tire that is made of steel wires, wrapped or reinforced by ply cords and that is shaped to fit the rim.

Bead separation - This is the breakdown of the bond between components in the bead.

Bias ply tire - A pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the centerline of the tread.

Carcass - The tire structure, except tread and sidewall rubber which, when inflated, bears the load.

Chunking - The breaking away of pieces of the tread or sidewall.

Cold inflation pressure - The pressure in the tire before you drive.

Cord - The strands forming the plies in the tire.

Cord separation - The parting of cords from adjacent rubber compounds.

Cracking - Any parting within the tread, sidewall, or inner liner of the tire extending to cord material.

CT - A pneumatic tire with an inverted flange tire and rim system in which the rim is designed with rim flanges pointed radially inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

Curb weight - The weight of a motor vehicle with standard equipment including the maximum capacity of fuel, oil, and coolant, and, if so equipped, air conditioning and additional weight optional engine.

Extra load tire - A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Groove - The space between two adjacent tread ribs.

Gross Vehicle Weight Rating (GVWR) - The maximum permissible weight of this fully loaded motorhome.

Gross Axle Weight Rating (GAWR) - The value specified as the load carrying capacity of a single axle system, as measured at the tire-ground interfaces.

Hitch Weight - The vertical trailer load supported by the hitch ball.

Innerliner - The layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.

Innerliner separation - The parting of the innerliner from cord material in the carcass.

Intended outboard sidewall - The sidewall that contains a white-wall, bears white lettering or bears manufacturer, brand, and/or model name molding that is higher or deeper than the same molding on the other sidewall of the tire or the outward facing sidewall of an asymmetrical tire that has a particular side that must always face outward when mounted on a vehicle.

Light truck (LT) tire - A tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

Load rating - The maximum load that a tire is rated to carry for a given inflation pressure.

Maximum load rating - The load rating for a tire at the maximum permissible inflation pressure for that tire.

Maximum permissible inflation pressure - The maximum cold inflation pressure to which a tire may be inflated.

Maximum loaded vehicle weight - The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.

Measuring rim - The rim on which a tire is fitted for physical dimension requirements.

Non-pneumatic rim - A mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

Non-pneumatic spare tire assembly - A non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

Non-pneumatic tire - A mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle and does not rely on the containment of any gas or fluid for providing those functions.

Non-pneumatic tire assembly - A non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

Normal occupant weight - This means 68 kilograms (150 lbs.) times the number of occupants specified in the second column of Table I of 49 CFR 571.110.

Occupant distribution - The distribution of occupants in a vehicle as specified in the third column of Table I of 49 CFR 571.110.

Open splice - Any parting at any junction of tread, sidewall, or innerliner that extends to cord material.

Outer diameter - The overall diameter of an inflated new tire.

Overall width - The linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

Pin Weight - The vertical trailer load supported by the king pin of a fifth wheel hitch.

Ply - A layer of rubber-coated parallel cords.

Ply separation - A parting of rubber compound between adjacent plies.

Pneumatic tire - A mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

Production options weight - The combined weight of those installed regular production options weighing over 2.3 kilograms (5 lbs.) in excess of those standard items which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

Radial ply tire - A pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the centerline of the tread.

Recommended inflation pressure - This is the inflation pressure provided by the vehicle manufacturer on the Tire Information label and on the Certification / VIN tag.

Reinforced tire - A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Rim - A metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

Rim diameter - This means the nominal diameter of the bead seat.

Rim size designation - This means the rim diameter and width.

Rim type designation - This means the industry of manufacturer's designation for a rim by style or code.

Rim width - This means the nominal distance between rim flanges.

Section width - The linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.

Sidewall - That portion of a tire between the tread and bead.

Sidewall separation - The parting of the rubber compound from the cord material in the sidewall.

Test rim - The rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.

Tread - That portion of a tire that comes into contact with the road.

Tread rib - A tread section running circumferentially around a tire.

Tread separation - Pulling away of the tread from the tire carcass.

Treadwear indicators (TWI) - The projections within the principal grooves designed to give a visual indication of the degrees of wear of the tread.

Vehicle capacity weight - The rated cargo and luggage load plus 68 kilograms (150 lbs.) times the vehicle's designated seating capacity.

Vehicle maximum load on the tire - The load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.

Vehicle normal load on the tire - The load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I of CRF 49 571.110) and dividing by 2.

Weather side - The surface area of the rim not covered by the inflated tire.

Wheel center member - In the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the nonpneumatic rim and provides the connection between the non-pneumatic rim and the vehicle; or, in the case of a non-pneumatic tire assembly not incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic tire and provides the connection between tire and the vehicle.

Wheel-holding fixture - The fixture used to hold the wheel and tire assembly securely during testing.



To Our Valued Customer:

If you have a problem obtaining satisfactory and timely warranty service that may substantially impair use, value or safety of your Coachmen® product, please call our Service Support Department toll free at 1-800-453-6064 so that we may attempt to resolve your concerns.

You may also contact us through our Service Support website at:

www.coachmenrv.com

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