



# OWNERS MANUAL

**2010**

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## INTRODUCTION

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Outdoors RV Manufacturing appreciates and welcomes you as a customer. Your decision to own a travel trailer or 5th wheel trailer produced by Outdoors RV is a major purchase and we want your experience to be enjoyable.

To help get you started, please take a few minutes and review the Owner's Manual. The information provided is pretty straight forward and will help provide you with many of the functions and required maintenance procedures necessary on your RV.

Everyone involved in manufacturing your Outdoors RV travel trailer or 5th wheel, hope that you enjoy this product as much as we enjoyed creating it for you.

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### Owner's Information Package

Your trailer will require regular care and maintenance in order to deliver maximum value and performance. The dealer will give you basic operating and maintenance instructions. However, be sure to read all instructional material's furnished with the trailer. This information outlines important areas of operation and maintenance for you to follow for safe, trouble-free service from your trailer.

Specifications may change without notice due to continuous product improvement by Outdoors RV. It is possible that recent product changes may not be included in this manual. Product information included in this Owner's Manual were as accurate as possible at the time of publication and may or may not be specific in their depiction of actual equipment, fabrics, interior, or exterior décor or design options as installed on or in your travel trailer or 5th wheel travel trailer.

<b>▲ Warning</b>
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Failure to follow proper procedures or install proper equipment can result in property damage, injury and or death. The instructions included in this manual are intended as a guide, and in no respect extend the responsibilities to Outdoors RV Manufacturing beyond the standard written warranty as presented in this manual.
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## **WARRANTY INFORMATION**

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Proper maintenance will help avoid situations where the Limited warranty will not cover items due to neglect. As the owner of a new travel trailer or 5th wheel trailer, you are responsible for regular care and proper maintenance. Service should be performed in accordance with this manual, as well as corresponding manufacture's warranties on components included in your unit.

The owner is responsible to return the trailer to an authorized dealer for any repairs and service that may be required. Your Outdoors RV dealer is responsible for proper service before delivery and will have a continued interest in your satisfaction. We recommend that warranty and maintenance services be performed by your Outdoors RV Dealer.

### **Owner's Responsibility**

1. Perform proper care and maintenance as outlined by this manual and corresponding component warranty information. However; minor adjustments (such as adjustments to interior or exterior doors, cabinet latches, TV antenna control, etc.) will be performed by the selling dealer during the first 90 days after delivery. Thereafter, such adjustments are the responsibility of the owner as normal maintenance.
2. Written notice of defects must be given to the selling dealer or manufacture within 30 days of discovery by owner but no later than 10 days after the warranty expiration of the warranty period.
3. Returning your trailer to an authorized dealer for any repairs or service that is required.
4. Reviewing the information contained within this manual and all supplied component information.

### **Dealers Responsibility**

1. By agreement with the manufacturer, the dealer is obligated to maintain the trailer prior to retail sale, to perform a detailed predelivery inspection and to repair or replace any parts necessary to correct defects in material or workmanship.
2. Explain and review the Limited Warranty provisions to the customer.
3. Assist the customer with all necessary registrations and warranty cards for your new trailer.
4. Instruct the customer on how to obtain service and warranty on separately warranted components, whether in or out of warranty.
5. Service Outdoors RV products the dealer currently stocks.
6. Fill out and fax Warranty Registrations within 7 days from the date of delivery.

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## LIMITED ONE YEAR WARRANTY

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Outdoors RV manufacturing Warrants for a period on one (1) year from the date of purchase that the trailer or 5th wheel trailer manufactured and assembled by Outdoors RV Manufacturing shall be free from defects in materials and workmanship supplied and attributable to Outdoors RV. Except as specifically excluded below.

Outdoors RV, at its sole discretion, reserves the right to substitute parts or components of substantially equal quality, touch up cosmetic flaws, make design and or manufacturing improvements as the remedy under this Limited warranty. All owners (original or subsequent) must be properly registered with Outdoors RV Manufacturing to be considered for eligibility.

This Limited Warranty may be transferred during the one (1) year term by the original owner to a subsequent purchaser. The limited one (1) year warranty, however, shall in no way be extended beyond the one (1) year from the original date of purchase by reason of the transfer from the original consumer purchaser to any subsequent purchaser (s). The subsequent purchaser(s) also has an obligation to notify Outdoors RV immediately upon the transfer of the warranty and to provide proof of purchase within the one (1) year.

### Warranty Exclusions

**This limited Warranty and the obligations stated herein shall not apply to:**

1. Trailers used for business, rental, commercial, or disaster relief purposes other than recreational travel and family camping.
2. Trailers which are not originally sold through an authorized Outdoors RV dealer (i.e. sold through auction, repossession, salvage or otherwise "distressed" condition).
3. Equipment, products, components, appliances, or accessories not manufactured by Outdoors RV Manufacturing whether or not warranted, including but not limited to, tires, batteries, and other installed equipment or accessories.
4. Damage or loss caused in whole or part by misuse, abuse, neglect, theft, vandalism, trailer modification, improper customer or dealer installation, incorrect line voltage, unauthorized repair or failure to follow instructions supplied with the recreational vehicle.
5. Damage or loss caused in whole or in part by any unauthorized attachments, modifications or alterations to the structure, body, pin box, or frame of the recreational vehicle including but not limited to trailer hitches for towing, or platforms for supporting cargo.
6. Any upholstery damage including, but not limited to tears, punctures, or misuse.
7. Any fading or discoloring of fabrics, carpet, or floor roll goods.
8. Routine maintenance including, without limitation, caulking, recaulking and waxing of the body of the recreational vehicle, tightening screws, brake adjustments, latches, locks, changing fuses, or light bulbs, and maintaining the air conditioning and heating systems.

## Limited Warranty cont.

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9. Damage or loss caused in whole or in part by exposure to natural atmospheric elements, corrosive chemicals, ash or fumes generated or released by vehicles, collision, road hazards, rock chips, condensation, or any other source.
10. Damage or loss caused in whole or in part by overloading or the improper balancing of the load.
11. Damage or loss to the recreational vehicle caused in whole or in part by the tow vehicle selected by the owner to pull the recreational vehicle including but not limited to the improper selection or installation of the towing hitch on the tow vehicle.
12. Damage or loss caused in whole or in part by the willful or negligent acts of the driver of the vehicle pulling the recreational vehicle, an accident involving the recreational vehicle caused by the condition of any road surface over which the recreational vehicle is pulled, or striking or driving over a curb or any other object.
13. Any injury, loss or damage, beyond warranty repairs, due to mold or fungi.
14. Any incidental and consequential damages including, but not limited to transportation, fuel, food, lodging, telephone calls, towing charges, bus and taxi fares or car rentals, on-site service calls, as well as commercial use and loss of use.
15. Any trailer licensed , registered, or primarily used outside of the United States or Canada.
16. Damage to electronics due to voltage issues are not covered under warranty.
17. Damage or loss caused in whole or in part by the owners operation, use, or misuse of the tow vehicle.
18. Wheel alignment.
19. Any and all damage or loss to the owner's tow vehicle.

### Outdoors RV Responsibility

The distinction between "defects" and "damage" as used in this Limited Warranty: "defect" are covered : on the other hand , we have no control over "damage" caused by such things as collision, misuse and lack of maintenance which occurs after the recreational vehicle is delivered to the owner. Therefore, "damage" for any reason which occurs after the recreational vehicle is delivered is not covered under warranty. Maintenance services are also excluded from the warranty, as it is the retail owner's responsibility to maintain the recreational vehicle.

Outdoors RV does not take any responsibility, to any owner, beyond the original cost of the recreational vehicle to Outdoors RV or for any undertaking, representation, or warranty made by any dealer beyond the expressed herein.

### Owner Responsibility

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The owner is responsible to maintain the recreational vehicle as described in the Care and Maintenance section of the Owner's Manual including taking whatever preventative measures necessary to maintain the exterior sealants of the unit and to prevent foreseeable secondary moisture or water damage to the unit from rain, plumbing leaks, condensation and other natural accumulation of water in the unit. Examples of secondary damage include , but are not limited to, stained upholstery, carpeting or drapes, mold formation and growth, furniture cabinetry or floor deterioration, etc.

### Important Information

Mold is a fungus that occurs naturally in the environment and serves necessary functions including aiding in the decomposition of plant and other organic material. Mold spreads by means of microscopic spores borne on the wind and is found everywhere life can be supported. Mold has existed for millions of years, and human beings have coexisted despite their exposure to mold and mold spores.

If proper conditions are present, mold can and will grow in your recreational vehicle. Most RV owners are familiar with mold growth in the form of bread and cheese and on bathroom tile, in order to grow, mold requires a food source. These food sources might be supplied by items found in the RV such as fabric, carpet, wallpaper, or building materials (i.e., wood, and insulation). Also, most mold growth requires a temperate climate. The best growth occurs at temperatures between 40° Fahrenheit and 100° Fahrenheit. Most importantly, mold growth requires moisture, and moisture is the only factor that can be controlled.. By minimizing interior sources of moisture, an RV owner can reduce or prevent mold growth. However, if optimal growth conditions persist, mold can develop within 24 to 48 hours. Moisture in the RV can stem from a variety of sources such as spills, leaks, overflows, condensation, damp and standing water and human activity such as showering or cooking. Good maintenance practices are essential; in the effort to prevent or reduce mold growth. Mold is an environmental condition and is not covered by the terms of this Limited Warranty.

**Note: Please review the "Living With Your Trailer Section" in this Manual, which will provide steps you can take reduce the occurrence of mold growth.**

### How to Obtain Warranty Service

The retail owner must deliver the recreational vehicle to an authorized Outdoors RV dealer to obtain service. with proof of purchase and freight prepaid within a reasonable time after discovery of the defect within the warranty period. Outdoors RV does not cover any transportation cost incurred to transport the recreational vehicle to the dealer or to the manufacturing plant. All towing and or transportation costs are the owners responsibility. Upon requesting service you will be asked for:

1. Your name
2. Date of purchase
3. Outdoors RV trailer serial number
4. Provide explanation of required repairs

## **Warranty**

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### **How to Obtain warranty Service cont.**

#### **Appliance and Component Warranty Service/Administration**

Appliance and component manufacturers may or may not provide their own warranties. These warranties are separate from the Outdoors RV Limited Warranty and constitute the only warranty for these specific appliances and components. The terms, conditions and warranty periods of these items may vary from Outdoors RV Limited Warranty. For the appliance and component manufacturers providing warranties. All warranty claims for these components will be administered through the Outdoors RV dealer network. Outdoors' RV dealers will work directly with each individual appliance and or component manufacture. If the Outdoors RV dealer and or the retail owner needs assistance they should contact Outdoors RV at 541-624-5500. Outdoors RV will get in direct contact with the appliance and or component manufacture. After the one year warranty period, all appliance and component warranty must be directed to the respective appliance component manufacturers providing warranties. All warranty claims for these components will be administered by the appliance and or component manufacturer. In no way shall Outdoors RV Manufacturing Limited Warranty be modified or amended.

#### **Warranty Disclaimers**

The expressed warranty provided by Outdoors RV Manufacturing in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for any particular purpose, and in lieu of all other obligations or liabilities on the part of Outdoors RV. Implied warranties, including the implied warranty of merchantability or fitness for a particular purpose, if any, given by law, shall be limited to and not extend beyond the duration of the written warranty periods set forth herein. No Person has the authority to enlarge, amend, or modify this Limited Warranty.

Outdoors RV will not be responsible or liable for loss of use of the recreational vehicle, on site service. Calls or service charges, loss of time, inconvenience, expenses for gasoline, towing charges or transportation costs, loss of use, rental of substitute equipment, telephone, travel, lodging, damage or loss of personal property, loss of revenues or other commercial loss, or any other kind of nature resulting from any defect in the recreational vehicle.

Any action to enforce this Limited Warranty or any implied warranty shall not be brought more than one (1) year after the expiration of the one (1) year term of this Limited Warranty.

Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply. Further some states do not allow a reduction in the statute of limitations so the above reduction may not apply.

#### **Unit Packet**

The unit packet is located in the interior of the recreational vehicle. The packet contains product manuals and information on systems and equipment in the coach. Individual product warranty registrations accompany this information and should be completed and mailed promptly. Your dealer should provide you with any assistance you may need to complete the registration forms. Some components in this manual or packet may be components of a differing product line / or are optional equipment.



## Warranty

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### Inspection

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Each Outdoors RV dealer is required to review the limited warranty and inspect the unit along with you. The dealer has been provided with a pre-delivery checklist. Review this checklist with the dealer. You should not sign the checklist until this review is complete and any questions about anything you do not understand have been answered.

### Owner Registration

The owner registration form is completed at the dealership at the time of delivery. The new owner signs the form and the dealer will forward the completed registration form to Outdoors RV within seven (7) days. Be sure this form has been completed and signed prior to leaving the dealership.

### Obtaining Warranty Service

Service must be obtained from Outdoors RV authorized dealers. If you cannot locate a authorized Outdoors RV dealer you should contact **Outdoors RV Service Department at 541-624-5500** for assistance. Do not pay for any services or use non authorized dealers without obtaining **Prior Authorization** from Outdoors RV Manufacturing. Your incurred costs may not be completely covered by Outdoors RV Manufacturing.

**Note:** Your trailer is a recreational vehicle and not intended , nor manufactured, as a permanent residence. Outdoors RV Manufacturing is not responsible for any incurred costs for the service call charge, or time incurred to come out of your trailer.

### Know Your Recreational Vehicle Prior to Your First Trip

During the manufacturing process Outdoors RV has performed inspections and tests by qualified inspectors and then inspected by the selling dealer. You as the owners, will be the first to camp and extensively use the systems on your trailer. Everyone at Outdoors RV and at your dealership wants the first camping experience to be happy and enjoyable. Therefore Outdoors RV recommends a "Trial Camping Experience" before heading out. Plan a short trip near your home for the night or your driveway and really camp in your trailer.

By camping for several days, full time in your trailer, you will have the opportunity to use and become familiar to the systems within your trailer and find out what items are needed / not needed while camping. If any questions do arise, difficulties encountered or problems that occur after your trail, contact your dealer and ask any questions that have arisen. Getting to know your trailer before the first adventure can save a lot of frustration and leave more fun time.

### If You Need to Make an Appointment

#### ***Call Ahead***

Contact your dealer and provide the dealer with a list of dates that you can make the trailer available for the dealership. Mondays and Fridays are usually very busy for the dealer's service department, as are right before seasonal holidays.

### Provide the Dealer With a Repair List

Have a repair list available and provide a list of any known parts that are required to perform the

## Warranty

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### List cont.

repair (s). Your list may require special parts that the dealer may need to order. Please explain what you would like done over the phone or stop ahead of time so that you and the service department can discuss possible repair dates.

### Inspecting Repairs

Outdoors RV and your dealer want you to be satisfied with any repair. When the repair has been completed, inspect thoroughly. Have the dealer service personnel review the repair or repairs performed. Once satisfied, sign the Outdoors RV Warranty Repair Order. Your dealer should provide you with a copy of the Outdoors RV Warranty Repair Order.

#### **▲ Caution**

#### **Tow Vehicle Disclaimer**

In connection with the use and operation of Outdoors RV travel trailers and 5th wheel trailers, Outdoors RV customers and owners of Outdoors RV trailers and 5th wheel trailers are solely responsible for the selection and proper use of tow vehicles. All customers should consult with a motor vehicle manufacturer or dealer concerning the purchase and use of suitable tow vehicles for Outdoors RV travel trailers and 5th wheel trailers. Outdoors RV further disclaims any liability with respect to damages which may be incurred by a customer or owner of Outdoors RV recreational vehicles as a result of the operation, uses or misuses of a tow vehicle.

**Note: Outdoors RV Manufacturing Limited Warranty Does Not Cover Damage To The Recreational Vehicle As A Result Of The Operation, Use Or Misuse Of The Tow Vehicle.**

### **Effects of Prolonged Occupancy**

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Outdoors RV Manufacturing has designed your travel trailer or 5th wheel trailer as a recreational use and short-term occupancy. If you occupy your trailer for extended periods of time, be prepared to deal with condensation and humid conditions that may be encountered. The relatively small space and tight compact construction of modern recreational vehicles means that normal living activities of even a few occupants will lead to rapid moisture saturation of the air contained in trailer especially in cold weather.

Just as moisture collects on the outside of a glass of cold water during humid weather, moisture can condense on the inside surfaces of the trailer during cold weather when relative humidity of the interior air is high. This condition is increased because the insulated walls of a recreational vehicle are much thinner than house walls. Estimates indicate that a family of four vaporize up to three gallons of water daily through breathing, cooking, bathing and washing.

Unless the water vapor is carried outside by ventilation or condensed by a dehumidifier, it will condense on the inside of the windows and walls as moisture or in cold weather as frost or ice. It may also condense out of sight within the walls or the ceiling where it will manifest as warped or stained panels. Appearance of these conditions may indicate series condensation problem. When you recognize the signs of excessive moisture and condensation in the coach, action should be taken to minimize their effects.

### ***The Following Tips Will Assist With Condensation Problems***

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1. Allow excess moisture to escape to the outside when bathing, washing dishes, hair-drying, laundering and using appliances and non-vented gas burners.
2. Always use the vent hood when cooking.
3. Keep the bath door closed and the vent or window open when bathing and for a period of time after you have finished.
4. Do not hang wet clothes in the coach to dry.
5. In hot weather, start the air conditioner early as it removes excess humidity from the air while lowering the temperature.
6. Keep the temperature as reasonably cool during cold weather as possible. The warmer the vehicle the more cold exterior temperatures and warm interior temperature will collide on wall surfaces creating condensation.
7. Use a fan to keep air circulating inside the trailer so condensation and mildew cannot form in dead air spaces. Allow air to circulate inside closets and cabinets (leave doors partially open). Please keep in mind that a closed cabinet full of stored goods prevents circulation and allows the exterior temperature to cause condensation.
8. The natural tendency would be to close the trailer tightly during cold weather. This will actually compound the problem. Simply put, you need to remove some of the warm air and allow some cool air to get inside the trailer so the furnace will not recycle the humid interior air.
9. Use fluorescent ceiling lights and minimize prolonged use of incandescent lights, which produce heat and contribute to condensation in the roof above ceiling lights.

## ON THE ROAD

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**State Laws in the United States and Provincial laws in Canada vary concerning operator licensing requirements and vehicle dimensional restrictions. Check the laws in the area where you anticipate traveling.**

### **GUIDELINES FOR EQUIPMENT SELECTION AND PREPARATION**

Your towing equipment, its adjustments and how you load the trailer will have a great effect on trailer towing stability and handling. The following rules will help you select and adjust your equipment in a manner that will help produce acceptable towing characteristics. Also check specific requirements in the states and provinces where you will travel.

### **TRAILER LOADING**

Before discussing equipment selection, we need to explain some common weight terms. We'll use abbreviations in our discussion. These terms are:

**CCC (Cargo Carrying Capacity)** is the available weight capacity for cargo however dealer options may reduce this by the LCCR.

**GAWR (Gross Axle Weight Rating)** is the maximum permissible loaded weight a specific axle is designed to carry.

**GCWR (Gross Combination Weight Rating)** is the value specified by the tow vehicle manufacturer as the maximum allowable loaded weight of the tow vehicle with its towed trailer or towed vehicle.

**GVWR (Gross Vehicle Weight Rating)** is the maximum permissible weight of this fully loaded trailer. GVWR includes all weight at the trailer axle(s) and tongue or pin. The GVWR is equal to or greater than the sum of the Unloaded Vehicle Weight plus the Cargo Carrying Capacity.

**LCCR (Load Carrying Capacity Reduction)** is the amount the CCC is reduced due to vehicle weight added by the dealer between vehicle certification and first retail sale.

**UVW (Unloaded Vehicle Weight)** is the weight of a vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, or accessories that are ordinarily removed from the vehicle when they are not in use. It includes all weight at the trailer axle(s) and tongue or pin. If applicable, it also includes propane and full generator fluids, including fuel, engine oil and coolants. UVW does not include cargo such as water in the various holding tanks.

- Use a tow vehicle with the appropriate axle capacity (GAWR) for your trailer, and which has the appropriate equipment (such as heavy duty radiator, transmission, final drive, suspension, wheels and tires). The tow vehicle must be rated by its manufacturer both to tow the gross weight (GCWR) and to carry the tongue weight of the fully loaded trailer. Weigh your loaded trailer and tow vehicle according to the instructions found in this chapter on Trailer Loading. Improper loading can lead to possible tire, axle and frame damage, and can lead to loss of towing stability and control resulting in a vehicle crash.

- Consult with your RV Dealer, or tow vehicle dealer, and towing equipment supplier to determine the correct type of hitch assembly, hitch ball, brake controller, and other equipment you should use for towing and leveling your trailer. Towing equipment to consider includes a weight distributing system, and a sway control system. The weight of your loaded trailer in comparison to the towing capacity of your tow vehicle should be evaluated during this consultation.

- Installation of tow equipment must be performed by a competent installer. Make sure the installation follows the tow vehicle and tow equipment manufacturer's instructions.

## On the Road - continued

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- Conventional trailers: Use a weight distribution hitch rated to pull not less than the trailer Gross Vehicle Weight Rating (GVWR) and with spring bars rated not more than the ratings shown under Trailer Loading in this chapter. The hitch must be equipped with a 2 5/16" diameter ball. Keep the hitch ball as close as practical to the rear bumper to minimize rear overhang. Under no circumstances add any hitch extenders to the rear of your tow vehicle.

- 5th Wheel trailers: Use a hitch and a receiver assembly sized for the 2" SAE king pin and rated to pull not less than the Gross Vehicle Weight Rating (GVWR) of the fifth-wheel trailer. The receiver should be attached to the truck chassis. No weight distributing or sway control devices are needed with a fifth-wheel hitch.



### CAUTION

CAUTION: Fifth-wheel hitch extenders (also called "gooseneck tongue adapters") are not to be used with Outdoors RV Mfg fifth-wheel trailers. Use of a hitch extending device may cause structural damage to the trailer pin box assembly or chassis. Damage caused by the use of a hitch extending device is not covered under the Outdoors RV Warranty Policy.

- Use a brake controller that automatically applies the brakes in proportion to the tow vehicle brakes and also has a hand control for applying the trailer brakes only. See the section in this chapter on Braking Systems.

- After loading your trailer for the first time, or if you change the loading configuration from your previously weighed loading configuration, it is recommended that you adjust the tow vehicle rear tires and the trailer tires to their maximum permissible inflation pressure until you reweigh the combination of tow vehicle and trailer. Maximum permissible inflation pressure can be found on the sidewall of the tire (see section of this manual titled "Information on Passenger Vehicle Tires" for an illustration of the location of this number on the tire. Note: On some tires this will only be on one sidewall of the tire.) Once you have weighed the tow vehicle and trailer combination and distributed the load to prevent exceeding any of the provided Gross Weight Ratings adjust the tire pressures\* to a number appropriate for the load each tire is actually carrying. Consult the tire manufacturers load charts for your tires to determine what the correct tire pressure is for the measured loads.

- Do not use different pressures for tires on the same axle. Adjust both tires on the same axle to a pressure appropriate for the tire position having the heaviest load.

- Use outside mirrors installed and adjusted to allow a clear view of the area at both sides of and behind the trailer. Locate them as close as possible to the driver to provide the maximum field of view.

- If you are towing a trailer that is wider than your tow vehicle, you will need extended side view mirrors to see rear and side approaching traffic.

## STATE, CANADIAN PROVINCIAL AND LOCAL REQUIREMENTS FOR TOWING

States, Canadian provinces and municipalities may require special permits and licenses based on the size and weight of your trailer, especially if it is over eight feet wide. Some states or Canadian provinces may require additional equipment for the tow vehicle, such as side and rear view mirrors. Inquire at your local motor vehicle administration to find out what requirements affect you. If you plan to travel in another state or Canadian Province, don't forget to check its requirements also. For example, surge brakes may not be legal in some jurisdictions. In addition to licenses and permits, there may be weight, height, and width limits for using certain roads, bridges, and tunnels. Also, be aware of restrictions regarding the transport of Propane and other volatile gases or fuels in tunnels. And don't forget to contact your insurance company to make sure you have the proper coverage.

## HITCHING UP

The hitch, spring bars, sway control, safety chains, and breakaway switch are all important safety devices that

protect your investment as well as other peoples lives and property. As a trailer owner, it is your responsibility to be familiar with these devices and their proper use. Make sure you read and understand the instructions furnished by the manufacturers of each of these devices. Hitching up your trailer will become routine with experience. Make it a habit to examine all hitch components before hitching the trailer. Always inspect the condition of wiring and connectors for damage and function. If you have a conventional ball hitch, check for cracked or bent parts, cracked welds, and deformed or stripped bolts. Be sure the hitch ball is tight and well lubricated. Check the trailer tongue for cracks, especially under the front cross member. Be sure the coupler locking device works freely. Inspect the safety chains. If you find defects in any hitch component, correct it before towing the trailer. If you have a fifth-wheel model, check all truck mounted hitch components. Check for worn, cracked or bent parts. Be sure the pin locking device works properly. Inspect the pin box assembly on the trailer. Check the king pin. If you find defects in any hitch component, correct it before towing the trailer. Be sure that all moving parts of the hitch are well lubricated.

√ **NOTE**

Weight carrying hitches are designed to carry all of the trailer's tongue weight. Weight-distributing hitches are used with a receiver hitch and special parts that distribute the tongue weight among all tow vehicle and trailer axles.

**HITCHING PROCEDURE FOR CONVENTIONAL TRAILERS**

Before attempting to hitch up your trailer, read the instructions provided by the hitch manufacturer. The following instructions are usable in most cases. If the instructions provided with your hitch deviate from this procedure, follow the hitch manufacturer's instructions. Hitching up is a two-person job. One person should drive the truck and the second person should act as a spotter to assist the driver when maneuvering the truck into position. The trailer should be on flat level ground when stored. When hitching up it is recommended that a set of wheel chocks be used on at least one tire. One chock in front of the tire and one chock behind the tire. This will help reduce any unintentional movement of the trailer.

- 1) Hitching procedure: Turn the tongue jack crank clockwise (or operate power jack) to raise the tongue and coupler. Raise the tongue sufficiently to clear the hitch ball on the tow vehicle.
- 2) Back the tow vehicle slowly until the hitch ball is directly under the coupler ball socket. Keep spotter's body parts away from this area during this maneuver.
- 3) Be sure the coupler latch locking lever on the tongue is fully open. Lower the tongue jack until the ball is firmly seated in the socket. Close the coupler latch and secure it with a locking pin, bolt, or small padlock.
- 4) For Weight Distributing Hitches (If equipped) - Raise the tow vehicle and trailer with the tongue jack high enough to allow room to install the weight distributing hitch spring bars.
- 5) Attach the spring bars according to the hitch manufacturer's instructions.
- 6) After adjusting the spring bars, according to hitch manufacturer's instructions, lower the jack, remove the foot, and fully retract the jack. Step back and check that the trailer is level from front to back. Do not permit the front of the trailer to be lower than the rear on tandem axle trailers; this reduces tongue weight and loads the front axle, reducing sway stability. Adjust the hitch ball height if necessary.
- 7) For Sway Control Devices (If equipped) - Adjust the sway control system according to the manufacturer's instructions.
- 8) Hitching Procedure Continued - Connect the safety chains. Loop each chain through a suitable attachment eye on the tow vehicle and insert the chain quick coupler through an appropriate chain link. Adjust each chain length so it is as short as possible but still permits full turn angles without becoming tight. Both chains should be the same length and short enough to cradle the trailer's tongue off the ground if the trailer ever accidentally becomes uncoupled. **WARNING** - Never attach safety chains to the hitch ball or to any removable part of the hitch.



**WARNING**

Never attach safety chains to the hitch ball or to any removable part of the hitch.

## On the Road - continued

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- 9) Connect the breakaway switch lanyard to an attachment eye on the tow vehicle. Be sure that the switch lanyard is adjusted so the switch is not activated during a full "jackknife" turn. **WARNING** - Do not connect the breakaway switch lanyard to the hitch ball or to any removable part of the hitch.

Remember that the breakaway switch's emergency braking feature requires a fully charged battery on the trailer. This important safety item is required in most states.

- 10) Plug the 12-volt electrical cord into the mating tow vehicle socket.
- 11) Run an operational check of stop lights, turn indicators, running lights, and electric brakes before driving off. See Braking System in this chapter and Electrical System chapter for more details about the electrical systems. Remove tire chocks.
- 12) Reverse the procedure for unhitching.

√ **NOTE**


After every trip both the pin and the coupler should be inspected for wear or damage. If any excessive wear or cracking is observed, have the trailer inspected by a qualified professional and if necessary replace the affected parts.

### ADJUSTABLE HEIGHT COUPLER (If equipped)

#### Bolt Application

- 1) Fasten coupler to bracket with two 5/8" diameter bolts S.A.E. grade 8 and lock nuts or nuts and lock washers.
- 2) Torque bolts to 200-230 ft. lbs (dry)
- 3) Retorque bolts per instruction in "Wheel Lug Nut Torque and Tightening Intervals", section of this manual.

#### Latching Instructions

 **WARNING**

PERSONAL INJURY.  
Always open latch handle before inserting ball

- 1) Insert finger in latch hole. Pull out and up on latch. Rotate latch 90 degrees from original position.
- 2) Place coupler on ball matching the size called out on the coupler and of same or greater capacity than trailer GVW (Gross Vehicle Weight.)
- 3) When ball is completely nested in ball socket, push forward on latch. Be sure that the tab on the latch is secured in slot.
- 4) Extend jack to ground and lift car/trailer combination 2"-4" to insure coupler is securely attached to tow ball. Retract jack completely before towing.
- 5) Insert padlock or bolt through lock hole in latch for theft protection.

√ **NOTE**


These couplers are not adjustable for ball size. Use a ball that is the same size as the size listed on the hitch coupler and or the same or greater capacity than the trailer GVW (Gross Vehicle Weight)

#### Maintenance

- 1) Lubricate ball socket and ball clamp with wheel bearing grease. Clean and lubricate monthly.
- 2) Check towing hitch, ball and coupler for signs of wear before each trip. Replace coupler if damaged or worn.
- 3) Lubricate moving or sliding parts other than ball socket and ball clamp monthly with SAE 30 weight oil.

## HITCHING PROCEDURE FOR FIFTH-WHEEL TRAILERS

Before attempting to hitch up your trailer, read the instructions provided by the hitch manufacturer. The following instructions are usable in most cases. If the instructions provided with your hitch differ from this procedure, follow the hitch manufacturer's instructions.

 <b>CAUTION!</b>
Although fifth-wheel trailers will not normally move when parked with the landing gear down it is highly recommended that wheel chocks be placed in front and rear of at least one tire to help prevent movement.

Always ensure that the trailer is stable before attempting to hitch up.


Determine the height of the receiver on the truck and use the landing gear to adjust the trailer to about the same level. A tape measure is a helpful tool. Make sure the height of the trailer pin box has been adjusted so that the loaded trailer is level when attached to the truck and ready to travel.

Both the truck and the trailer should be on level ground. Connecting the receiver and pin box will be much easier if both height and side-to-side level are carefully matched.

### Procedure for Hitching:

- 1) Raise or lower the front of the trailer using the landing gear so that the king pin height closely matches that of the coupler assembly in the truck.
- 2) Open the coupler-locking device so that the pin can engage the hitch plate jaws.
- 3) Lower the truck tailgate.
- 4) Slowly back the truck towards the pin box until the king pin and coupler are in close proximity and stop with the engine running, transmission in park and parking brake engaged.
- 5) Plug in the 12-volt electrical cord to the mating receptacle in the truck bed.
- 6) Raise or lower the trailer pin box to match the coupler.
- 7) Continue backing and engage the king pin and coupler completely.
- 8) Close the couple-locking device, engage the safety latch and install security pin (or lock)
- 9) To ensure the system is fully engaged and locked, move truck slightly tugging forward a few inches being careful not to bend the fifth wheel landing gear to confirm the trailer has resistance to motion.
- 10) Place the transmission in park and set the parking brake, raise the fifth wheel landing gear and remove any tire chocks.
- 11) Connect the breakaway switch lanyard. Be sure the lanyard is adjustable so that the switch is not actuated during a full "jackknife" turn.
- 12) Close the truck tailgate.
- 13) Run an operational check of stoplights, turn signals, running lights, and electric-brakes before driving off. **See *Braking System*** in this chapter and ***Electrical System*** chapter for details.

√ <b>NOTE</b>
Periodically check pin box adjusting bolt torque with a torque wrench. Torque to 150 ft-lbs.

 <b>CAUTION!</b>
Damage will occur to your truck and/or trailer if you fail to lower the truck tailgate prior to hitching or fail to raise the truck tailgate after hitching.

### Procedure for Unhitching:

- 1) Identify a flat and level location to unhitch and position the trailer.



- 2) Position wheel chocks to at least one tire location both in front and rear of the trailer tire(s).
- 3) Raise the trailer using the landing gear until the truck bed is unloaded and the pin box is free.
- 4) Disconnect the breakaway switch, 12-volt electrical cord and lower the tailgate.
- 5) Open the coupler-locking device so that the king pin can disengage the hitch plate jaws.
- 6) Slowly move the truck forward ensuring the trailer and cords are clear. Once free raise the tailgate to the closed position.
- 7) Add lubricant/grease to the coupler locking device and pin. This will keep the parts rust free and ready for the next use.

√ **NOTE**  
After every trip both the pin and the coupler should be inspected for wear and damage. If any excessive wear or cracking is observed, have the trailer inspected by a qualified professional and if necessary replace the affected parts.

## **BRAKING SYSTEM**

The electric brakes on your trailer are similar to the drum brakes on many cars and trucks. The basic difference between them is that your trailer brakes are operated by 12-volt DC power from the tow vehicle, rather than by hydraulic action. The brakes have been factory calibrated for smooth, positive response. During break-in, they may squeak; this is normal and should cease after a few miles of wear.


### **Brake System Components**

The brake system on your trailer consists of several major components, all of which must function properly for safe braking.

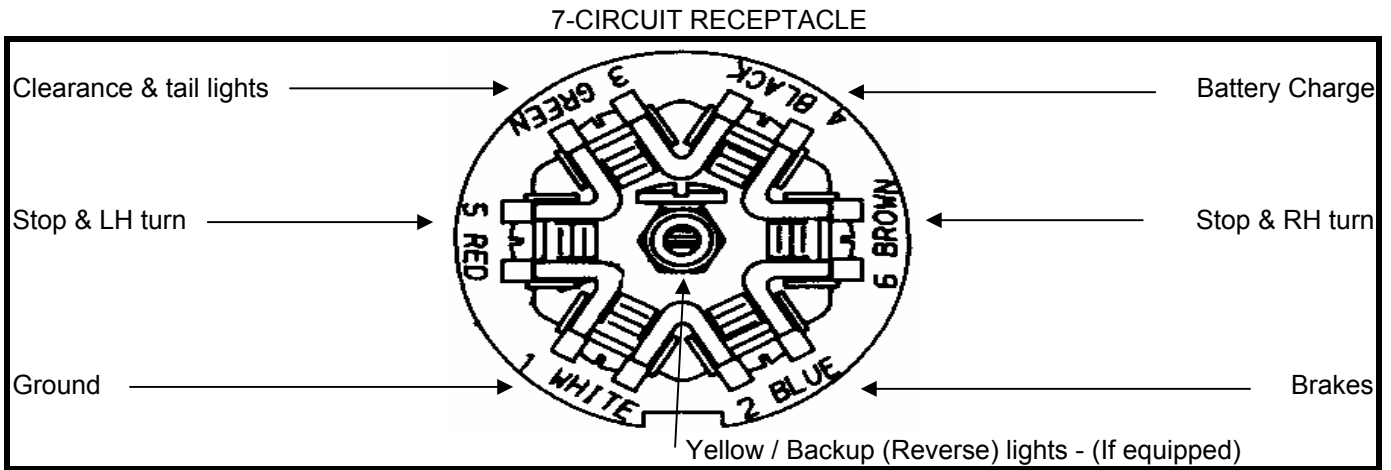
- **Tow Vehicle Battery** - The tow vehicle is the primary electrical power source for the trailer braking system. The connection is made at the positive post of the battery, or at the tow vehicle starter solenoid battery terminal.

- **Brake Controller** - The brake controller is not supplied with your trailer. The electric trailer brakes are automatically applied by the brake controller, which is mounted within easy reach of the driver. This controller is connected to the tow vehicle's brake system and is actuated whenever the tow vehicle's brakes are applied. It may also be used to manually apply the trailer's brakes to control sway (see section on **Safe Driving Rules** in this chapter). The controller should have an adjustment for its engagement point; it is best to have the trailer brakes start acting slightly before those of the tow vehicle. This is called brake "lead". This causes the trailer to pull against the tow vehicle, keeping the two vehicles in alignment. This is particularly important during rainy weather or whenever the road surface is slippery. If the tow vehicle sets its brakes first, the trailer will tend to push the tow vehicle and possibly "jackknife". You may also need a resistor to keep trailer braking force low enough to prevent wheel lockup. Consult your controller instructions or a professional installer for further information and wiring instructions.

√ **NOTE**  
The brake controller is not supplied with your trailer.

 **WARNING**  
Do not install a fuse in the circuit between the tow vehicle battery and the brake controller. A blown fuse would cause the controller to cease operation both automatically and manually, causing loss of trailer braking with no advance warning.

- **Connector Plug** - The multi pin cord connector at the front of the trailer transfers electrical power from the tow vehicle's battery to the trailer brakes, exterior lighting system, and trailer battery.



*Brake System Connector Plug*

Certain models may be equipped with backup (reverse) lights which will be connected to the Auxiliary (Yellow - 7) position of the Brake System Connector Plug. Keep the plug clean, tight, and protected from the elements. Inspect it carefully every time you hitch up. Be certain that your installation includes a "charge line" from the alternator on the tow vehicle to terminal number four on wire should be 10 gauge stranded copper with insulation rated for under hood temperatures. A 30-amp circuit protector should be installed near the alternator connection. This circuit will keep the trailer battery charged as you travel. See Electrical Systems chapter.

- **Trailer Battery** - The trailer battery provides power to activate the brakes in case of an emergency where the trailer becomes unhitched during towing. NOTE: The battery is not supplied by the trailer manufacturer.

- **Breakaway Switch** - The breakaway switch is located on the trailer tongue or pin box. This important safety item is required in most states. It has a steel cable (lanyard) fastened to it which will reach to the frame of the tow vehicle. This device is one of the most vital components on your trailer's braking system. It automatically applies the trailer brakes if the tow vehicle and trailer become uncoupled while in motion. The breakaway switch operates when a pull pin linked by the cable to the tow vehicle is separated from the switch. When the switch closes, power for brake application is transferred from the onboard trailer battery. The steel lanyard must be anchored to the tow vehicle when the trailer is hitched up. Secure this cable loop to the permanent frame of the tow vehicle, or a part of the hitch that is non-removable. Do not fasten the breakaway switch lanyard to the hitch ball or any other removable part of the hitch. Remove the pull pin every three months and lubricate it with light oil. Before reinserting the pin, spray the inside of the switch with an electrical contact cleaner to prevent corrosion.

Test the breakaway switch operation before each trip as follows:

- 1) Hitch the trailer to the tow vehicle.
- 2) Pull out the breakaway switch actuating pin.
- 3) Test brakes by attempting to drive away. The breakaway switch is functioning properly if the trailer brakes are activated.
- 4) If the brakes are not activated, check that the trailer battery is connected and fully charged, and the trailer brakes are properly adjusted.
- 5) Obtain service repair if the trailer brakes do not operate after making these checks.
- 6) Reinsert the breakaway switch actuating pin before towing the trailer.

**▲ WARNING**

Do not tow a trailer with a malfunctioning breakaway switch, or a dead or missing battery.

**▲ WARNING**

Do not leave the pull pin out of the breakaway switch for more than a few minutes, or the battery will be drained. Do not use the breakaway switch for a parking brake.

- **Trailer Brakes** - Your trailer brakes are actuated by electrical energy from the brake controller. The greater

the braking effort from the brake controller, the greater the breaking force applied to the trailer brakes. The trailer brakes are also actuated by the breakaway switch in case the tow vehicle and trailer become uncoupled. To insure brakes are in good working order, brake shoes and drums should annually be checked for wear.

- **Grounding** - The electrical circuit that operates your trailer brakes can be reliably completed only by proper grounding back to the tow vehicle. A poor ground circuit from the brakes to the tow vehicle battery can hurt braking performance as much as a poor primary circuit from the battery to the brakes. Do not rely on the hitch ball/coupler or fifth wheel hitch mechanism for a good ground. Run a separate ground wire from the cord receptacle to the tow vehicle negative battery post, or to the tow vehicle frame. The ground conductor must be the same wire size as the charge line (10 gauge minimum)

### **BRAKING TIPS**

- Before moving your trailer, inspect all external braking system components. Inspect all wiring connections. Test the breakaway switch as outlined above.

- Never use the trailer brakes alone for extended periods. They are designed to stop the trailer, not the tow vehicle. This action places excessive loads on the brakes, causing overheating, fading, and premature wear.

- Never use the tow vehicle brakes alone. The added weight of the trailer will more than double the load on the tow vehicle brakes, causing overheating, fading, and premature wear. Driving control can also be affected, due to the force of the trailer pushing against the tow vehicle. On slippery road surfaces this can result in jackknifing.

- Always use the automatic brake controller. This synchronized braking system allows you to drive in the manner recommended by experts: both hands on the steering wheel. The brake controller is properly adjusted when the trailer brakes slightly "lead" the tow vehicle brakes. This will help keep the vehicles aligned for a safe, straight stop.

- Downgrades and curves require reduced speeds. A downgrade will require lower transmission gears and slower speeds to keep the brakes from overheating.

- Rain or slippery conditions require reduced speeds. Whenever in doubt, reduce your vehicle speed to ensure predictable, safe operation.

### **TRAILER LOADING**

A trailer chassis (suspension, wheels, tires, axles, frame and tongue) is designed to carry a certain maximum load. This load consists of the empty trailer itself, plus weight added in the form of water, food, clothing, and anything else that may be stored in or attached to the trailer. The maximum load for which the trailer is designed is called the Gross Vehicle Weight Rating (GVWR), and is the total of the weight on the axles and the weight on the trailer tongue or fifth-wheel king pin. Another critical weight factor is the Gross Axle Weight Rating (GAWR). This is the maximum weight a specific axle is designed to carry. Again, the rating represents the empty vehicle's axle weight plus the maximum added load. On trailers with more than one axle, the weight is divided between each axle and each has its own GAWR. The total of all axle loads plus the tongue weight must not exceed the GVWR. The tires equipped with your trailer are designed to carry the loads specified. Tires need to be of sufficient capacity to carry the load. Always maintain required tire pressure by checking frequently. Never replace or mix tires with a lower capacity specification. In addition to knowing the overall weight that can be safely loaded in or attached to the trailer, you must know how to distribute this weight so that correct amounts of weight are placed on the axles and tongue. Proper weight distribution for a tandem axle conventional trailer should have between 9% to 15% of the loaded trailer weight on the tongue. Single axle trailers should have at least 10% to 15% on the tongue. Depending on your tow vehicle, the preferred weight on the tongue for conventional trailers is 11% to 12%. Fifth-wheel king pin weights should be 15% to 25% of the loaded fifth-wheel weight. Proper weight distribution is required for towing stability and will assure that the trailer is not rear, front, or side heavy. A light tongue weight or heavy weights placed at the rear end of the trailer may cause sway. On the other hand, too much weight on the tongue can overload the tow vehicle and cause poor tow vehicle braking, poor steering, poor cornering, and can damage the trailer frame.

 **WARNING**

Do not exceed the specified tongue weight or spring bar rating. Damage to the trailer frame and poor handling and braking may result.

 **WARNING**

Before towing this trailer consult the Owner's Manual for proper conventional loading, weighing procedures and definitions. For safe operation on the road you must: Keep the loaded tongue weight between 10% and 15% of the trailers total weight. Do not exceed the trailer GVWR and GAWR. Do not exceed the tow vehicle GVWR, GAWR, GCWR or hitch rating. Failure to move cargo or remove cargo to keep within the weight limits can result in damage and/or loss of stability when towing resulting in serious injury or death. The following warning tag is installed on your trailer. Please follow all recommendations in the Owner's Manual when loading and towing your trailer.

**DETERMINING AND DISTRIBUTING YOUR TRAILER'S LOAD**

The Gross Vehicle Weight Rating (GVWR) and the Gross Axle Weight Rating (GAWR) for your trailer are found on the label attached at the front road side of the trailer. You must compare the GVWR with the actual loaded weight of your trailer. If the loaded weight of your trailer exceeds the GVWR, your trailer is overloaded and in such a way you will have to remove items to bring the weight below the GVWR. Follow the method outlined here to determine the weight distribution of your trailer. When weighing your trailer or tow vehicle always use a platform scale such as those used by trucking companies or highway weigh scales. The weigh station attendant can guide you through the correct positioning of the trailer and tow vehicle onto the scales.

- 1) **Weigh the trailer by itself.** After driving the tow vehicle and trailer onto the scale, disconnect the trailer from the tow vehicle and move the tow vehicle off the scale. The measured weight of the loaded trailer must not exceed the GVWR of the trailer. If the GVWR is exceeded cargo or equipment items must be removed.
- 2) **Find the tongue weight.** When the total trailer weight is under the rated GVWR, you next determine the trailer pin or tongue/coupler weight. Re-hitch the truck to the trailer. Move the trailer until the pin or tongue is off the scales. Ensure the system is level. Read the 5th wheel or trailer weight on the axles alone. Subtract weight on the axle(s) from the total weight. This weight difference will be the approximate pin or tongue weight.
- 3) **Calculate the percentage tongue weight.** Divide the loaded tongue weight by the total loaded trailer weight. Multiply this result by 100. This will tell what percent of the total weight the pin or tongue is carrying. You need to know this to properly load your tow vehicle. If the tongue weight exceeds the proper range for your trailer, shift some of the load rearward to arrive at the proper load. If the tongue weight is below the proper range, move some of the load forward. If you have to shift the load to get the proper pin or tongue weight, check to be sure that you do not exceed the weight rating of the axle(s), tire(s), tongue or hitch.

**Recommended Weight Distribution**

Conventional Trailer (Single Axle)	Minimum 10%	Maximum 15%
Conventional Trailer (Double Axle)	Minimum 10%	Maximum 15%
Fifth Wheel	Minimum 15%	Maximum 25%

 **CAUTION!**

Weight Distributing Hitches - A weight distribution hitch will change the weight distribution on the trailer and tow vehicle axles. If used, it is recommended that the trailer and tow vehicle be re-weighed to ensure that weight ratings are not exceeded.

- 4) With the trailer attached to the tow vehicle each wheel position should be weighted separately to be sure individual axles and tires are not overloaded. If an overload condition exists on any axle or wheel position, trailer loading must be redistributed or removed. If an overload situation is not corrected, tire or mechanical failures may occur. The individual wheel positions (particularly the rear positions) on the towing vehicle should also be weighed for possible overload while the trailer remains attached.

**1) To Obtain Individual Axle Weights, Gross Weights (Tow Vehicle) and Gross Combined Weight (Travel Trailer Plus Tow Vehicle):**

a) Drive onto the scale loaded with all supplies, passengers, and equipment,. Take a weight reading as the trailer comes onto the scale. It must not exceed the tow vehicle's front GAWR.

b) The second reading includes the total tow vehicle weight and a portion of the hitch load with the trailer connected. This weight must not exceed the tow vehicles GVWR.

c) Subtract the first reading from the second reading. The difference is the weight on the tow vehicle's rear axle. This must not exceed the tow vehicle's rear GAWR.

**2) To Obtain Individual Wheel Position Weights (Tow Vehicle):**

a) Place the right front tire of the tow vehicle on the scale and take a weight reading. Subtract this from the weight of the front axle to get the left front tire weight.

b) Place both right side tires on the scale and take a weight reading.

c) Subtract the weight of the right front tire from the weight of the right side of the tow vehicle to find the weight on the right rear tire.

d) Subtract the weight of the right rear tire from the weight of the rear axle to get the weight of the left rear tire.

e) Compare the weight on each tire to the tire load rating. The weights on the tires must not exceed the tire rating.

**3) To Obtain Individual Axle Weights (Travel Trailer):**

a) Place all of the trailer axles on the scale and record the weight.

b) Pull the trailer forward until the rear most axle is on the scale and the forward axle is off the scale. Record the weight of the rear axle only.

c) The difference between these two weights is the weight on the front axle.

d) Compare the weight of each axle to the gross axle weight rating. The weight on either axle must not exceed its GAWR.

**4) To Obtain Individual Wheel Position Weights (Travel Trailer):**

a) Place the right side tires of the trailer on the scale and take a weight reading.

b) Pull forward until only the right rear trailer tire is on the scale and take a weight reading.

c) Subtract the weight of the right rear tire from the weight of both right side tires to find the right front tire weight.

d) Subtract the weight of the right front tire from the front axle weight to find the left front tire weight.

e) Compare the weight on each tire to the tire load rating. The weights on the tires must not exceed the tire load rating.

 **CAUTION!**

Tire Load Rating's. Tire load ratings are dependent on the tire inflation pressures. Please refer to the tire manufacturers inflation charts. Under inflated tires can be damaged and result in a loss of inflation pressure.

Remember that your tow vehicle is an integral part of your total towing combination. Weigh and load it with the same considerations as the trailer. Gross weight and axle weight ratings will be found on tags on the driver's door pillar or inside the glove compartment door. Consult your tow vehicle Owner's Manual or Towing Guide for more information. If you do not have a towing guide, you should request one from the tow vehicle manufacturer.

Your trailer contains a tag listing your trailer's Cargo Carrying Capacity (CCC) and any reduction in that cargo carrying capacity due to modification to the vehicle between certification and first sale. Please note that the stated CCC may be limited by the tow rating of your tow vehicle. Ask your tow vehicle dealer for more information about tow ratings.

√ **NOTE**

Periodically reweigh your travel trailer and tow vehicle. Different traveling configurations may change your load and weight distribution.

 **WARNING**

Do not exceed the rated load of the tow vehicle, the trailer, or the rated capacity of any axle or tire.

√ **NOTE**

If other equipment or options such as leveling jacks, awnings, roof storage pods, etc., are installed after the trailer leaves the factory, the weight of these items must be subtracted from the load and cargo carrying capacity.

### How Overloading Affects Your Tires

The results of overloading can have serious consequences in terms of passenger safety. Too much weight for 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. 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 the tire, its load range and corresponding inflation pressure. Excessive load and/or under inflation cause "tire overloading." As a result, abnormal tire flexing occurs, which can generate an excessive amount of heat within the tire. Excessive heat may exceed the tire's capabilities, which may lead to tire failure. It is the air pressure which enables a tire to support the load, so proper inflation is critical. Since RV's can be configured and loaded in many different ways, air pressures must be determined from the 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, you must lighten the load.

**NOTE: Installing tires with a higher carrying capacity only solves the problem of tire overload. It has no effect on the over-loading of other components (i.e., rims, axles, shocks or bearings). Rims may not be capable of withstanding the higher pressures necessary to support the load. If the load cannot be adequately reduced, contact the RV manufacturer for advice.**

If you decide to install a tire size other than that originally provided on the vehicle, care must be taken to ensure adequate load carrying capacity and compatibility between tire and rim. If you have operated your vehicle with an under inflated tire, promptly have it removed from the wheel for a complete internal inspection to be sure it is not damaged. Tires driven even short distances while under inflated may be damaged beyond repair. Tires should be inspected regularly for excessive or irregular tread wear, bulges, aging, fabric breaks, cuts or other damages. Remove any nails, stones, glass, etc., embedded in the tread to prevent damage. Even minor damage can lead to tire failure. Replace tire when the tread is worn to 2/32" depth remaining in two or more adjacent grooves.

 **WARNING**

There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter. Always replace a tire with another tire of exactly the same bead diameter designation and suffix letters.

### Loading Tips

After you have determined how much weight you can carry and selected those items to make up that weight, make a list and keep it for future reference. Load the trailer so that you get proper weight distribution on the axles and tires. Make a loading diagram representing your properly loaded trailer. It will help you locate where specific items are stored and will help speed the loading process. Secure and brace stored items so they won't move during travel. Do not load heavy items near either end of the trailer or on the rear bumper. Adjust cargo to keep the side to side tire loads as equal as possible.

 **CAUTION!**

Do not install any type of weight carrying rack, frame, or hitch to the rear bumper, front A-frame assembly, chassis or body component of the trailer unless specified by the trailer manufacturer. Damage to the trailer body and unstable handling characteristics may result. Add-ons to the rear bumper, front A-frame assembly or the chassis could void your warranty on structural components.

√ **NOTE**

Use extra care in packing and storing dishes, utensils, and foods in the rear-kitchen models.

**▲ WARNING**

Exceeding the GAWR or GVWR of your tow vehicle or trailer can cause undesirable handling characteristics and may create a safety hazard. Modification of your vehicle by the addition of racks not specified by the manufacturer to carry additional equipment or vehicles is not recommended, may create a safety hazard, and may void your warranty.

**▲ WARNING**

Do not store or carry Propane containers, gasoline, or other flammable liquids inside your trailer.

**Cargo Carrying Capacity**

During the design and development of your trailer, the number and size of storage compartments and the liquid tank capacities are maximized for value and convenience. If the trailer operator fills all liquid tanks to capacity, and fills all storage compartments and cupboards to maximum volume with heavy items, the trailer could potentially be overloaded. The operator is responsible for analyzing the conditions under which the trailer will be used for each trip.

Thoughtful consideration of the weight placed in the trailer can yield important benefits:

- Maximum flexibility in the use of the available storage space provided in the trailer;
- Improved tow vehicle/trailer handling characteristics;
- Better tow vehicle fuel mileage and reduced tire wear.

**Safe Driving Guidelines**

***Outdoors RV does not recommend transporting passengers in your trailer while traveling.***

Your tow vehicle will have very different handling and stopping characteristics when it is towing a trailer. The following guidelines will help you develop needed driving skills for safe trailer towing:

- **Travel very slowly** if you are new to trailer towing, or if you have a new trailer or tow vehicle, until you have learned the handling and stopping characteristics of the tow vehicle/trailer combination. Practice turning, stopping, and backing in a secluded place away from traffic.
- **Do not permit a driver who is inexperienced at towing to operate your tow vehicle/trailer combination without your direct supervision.** Remember - it's slow speed for beginners.
- **Tow at moderate speeds** allowing for adverse highway and wind conditions. Even under the best of conditions, do not exceed posted speed limits for vehicles towing trailers. As speed increases, trailer sway stability, stopping ability, and the ability to make emergency maneuvers are greatly reduced.
- **Reduce speed before starting down hills** - even short ones - and avoid heavy tow vehicle braking on downgrades. Trailer towing stability is reduced when traveling downhill, and is further reduced by tow vehicle braking.
- **Slow down before entering turns** and avoid heavy braking in turns. Trailer stability is reduced in turns, and the weight of the trailer tends to push the back of the tow vehicle outward in turns, which can cause loss of control and "jackknifing."
- **If it is windy or passing vehicles are affecting the trailer, slow down** until full, comfortable control can be maintained. Trailer sway can be started by crosswinds and the wind from passing vehicles, especially trucks and buses passing from the rear. Reduced speed improves trailer stability and handling.
- **Do not use an automatic speed control while towing.** These devices can interfere with your ability to slow down in an emergency.
- **Avoid quick steering movements** that can start the trailer swaying.
- **Close, lock and deadbolt** the entry door and secure all windows and slide-outs before traveling.

## On the Road - continued

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- **Plan your trip and map out the roads you plan to use.** Find out the grade of the area you will be traveling in. Some mountain passes have extreme conditions in elevation grade and curves you may prefer to avoid.

- **Rain or snow/ice conditions require extreme caution when towing.** Vehicle speeds should be reduced and in some cases, towing should be avoided.

- **Maintain at least twice the normal stopping distance while towing your trailer.** The increased weight of the combination of vehicles requires greater stopping distances.

- **Use lower gears on long grades.** Downshift on upgrades to avoid overheating or undue engine loads. Downshift on downgrades to allow engine braking to assist in controlling vehicle speed. Avoid continuous or frequent brake application. The weight of the combination of vehicles can cause brakes to overheat and fade.

- **Allow ample time for passing.** Your acceleration will be much slower and your combination of vehicles is much longer than the tow vehicle alone.

### If the Trailer is Swaying

- ***Steer as little as possible while maintaining control of the vehicle. Because of your natural reaction time lag, quick steering movements to counter trailer sway can actually cause increased sway and loss of control. Try to hold the wheel as straight as possible until stability is regained.***

- ***Slow down but avoid strong tow vehicle braking. Reduce speed gradually whenever possible. Use the hand control to gradually apply the trailer brakes, this will help keep the vehicles aligned. Tow vehicle braking reduces trailer stability, and sliding tow vehicle tires causes loss of control and jackknifing.***

- ***If a reduction in trailer stability has occurred, slow down immediately and stop as soon as possible. Check tire pressures, sway control adjustment (if equipped), hitch spring bar adjustment (if equipped), cargo weight distribution, and look for any signs of mechanical failure. Until the problem has been identified and corrected, travel at reduced speeds that permit full control.***

Once you become accustomed to the feel of your tow vehicle/trailer combination, you will find towing your trailer comparable to driving your family car. Become familiar with the position of the trailer in traffic, and be cautious when maneuvering to allow for its length and width. Always allow extra room to corner and to change lanes. Learn to use the side mirrors to view the road behind and to the sides. Check them often.

Allow for the extra height of your trailer and avoid areas having low overhead clearance. Check for low hanging tree branches or other obstructions whenever you drive, park, or when pulling in for fuel or service. Always check over-head clearances of overpasses and bridges. This may be particularly important if you drive with the roof vents open or if the trailer is equipped with a roof air conditioner, roof rack, or antennas.

### BACKING UP

Place your hand at the bottom of the steering wheel. The back of the trailer will move in the same direction that your hand moves. The rear of the tow vehicle will go the opposite way you want the trailer to turn. Be careful as the trailer/tow vehicle angle gets large; the hitch and/or tow vehicle and trailer may be damaged by jackknifing.

You will need a much greater turning radius than the tow vehicle itself requires. When backing, be sure to watch not only the rear, but also both sides of the tow vehicle. Before backing up, you should designate a person to "spot" you to ensure that you will not bump the trailer into anything out of your field of view.

In time, and with a little practice, you will be able to back your trailer with little effort. Always be aware that you have poor visibility to the rear. Someone standing safely outside at the rear of the trailer to guide you in safe backing. Use both rear view mirrors when backing. If you are in doubt, stop, place the vehicle in park, shut the engine off, engage the parking brake, and go look for yourself at the trailer to ensure it is going where you intend it to go.



 **WARNING**

Ensure that small children are not present anywhere near your trailer when backing up.

**PARKING**

When parking parallel to a curb, be sure to allow for poles or other obstructions beyond the curb as the front and rear portions of the trailer swing wider than the tow vehicle's body. Always shift the transmission to PARK ("P") with automatic transmissions, or low or reverse with manual transmissions, and set the parking brake when parking.

***PARKING ON A GRADE***

Try to avoid parking vehicles with trailers on a grade or hill. However, if you must park on a grade, follow these steps:

- 1) Apply and hold the tow vehicle brakes.
- 2) Have someone place wheel chocks under the trailer wheels.
- 3) When the wheel chocks are in place and the assistant is clear, release the tow vehicle brakes until the chocks absorb the load.
- 4) Apply the tow vehicle parking brake.
- 5) Shift the transmission to "P" (PARK), with automatic transmission or low or reverse with manual transmissions.

If the vehicle is parked on a grade, don't shift the transmission to "P" (PARK) until the trailer wheels are chocked and the tow vehicle parking brake is set. If you do, the weight of the vehicle and trailer may put so much strain on the transmission that it may be hard to shift out of "P" (PARK).

When starting after being parked on a grade:

- 1) Apply and hold the tow vehicle brakes.
- 2) Start engine in "P" (for automatic transmission) or neutral with the parking brake set for manual transmissions.
- 3) Shift into gear and release the tow vehicle parking brake.
- 4) Release the tow vehicle brakes and move the trailer until the chocks are free.
- 5) Apply and hold the tow vehicle brakes and have an assistant remove the chocks.

**TIRES**

Your trailer is equipped with quality tires made by a major tire manufacturer. Under normal circumstances and with proper maintenance, you should receive thousands of miles of trouble-free service. For safety, trailer stability, and maximum tire life, vehicle speeds must be proper, proper inflation pressure must be maintained, and tread depth and wear must be monitored. Properly inflated and maintained tires also contribute to overall trailer stability and safety. Refer to tire manufacturer's information provided in your ***Owner's Information*** Package for information on maintenance and tire care. If no information is provided, please contact your local tire manufacturer's location for advice.

Be sure that an accurate tire gauge is part of your tool kit. Check the pressures in the morning before starting out, when the tires are cold. Don't forget the spare! Do not bleed air out of warm tires. Inflation specifications are for cold tires.

**If You Get a Flat Tire**

- In case of a sudden tire failure,
- Avoid heavy brake application
  - Gradually decrease speed

## On the Road - continued

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- Hold the steering wheel firmly and move slowly to a safe place off the road
- Park on a firm, level spot
- Turn off the ignition
- Turn on the hazard warning flasher system

### **WARNING**

Check tire pressures before traveling. Always check pressure when tires are cold. Do not exceed maximum recommended pressure.

### **WARNING**

Keep tires properly inflated. A tire that is run long distances or at high speeds while seriously under inflated will overheat to the point where the tire may lose air suddenly and/or catch fire, possibly resulting in damage to the vehicle and its contents and/or personal injury.

### **WARNING**

All your trailer tires should be the same type, size, and construction - do not mix bias-belted and radial tires.

## Changing a Flat Tire

Should you experience a flat tire, it is recommended that you summon professional help through your auto club road service, or a local tire service facility.

### **WARNING**

To avoid personal injury and/or property damage if a blowout or other tire damage occurs, obtain expert tire service help. Do not attempt to change the tire yourself. Do not reinflate a tire that has been flat or is seriously low on air. Have the tire removed from the wheel and checked for damage. Never add air to tires unless an accurate pressure gauge is used.

### **WARNING**

Do not crawl under or place any part of your body under an RV that is being lifted.

## WHEEL LUG NUT TORQUE AND TIGHTENING INTERVALS

Proper wheel lug nut torque is very important to safe and dependable trailering. The wheel and axle systems used in trailers are similar in many ways to those used in cars and trucks. But they differ in several important ways. These differences require special attention to wheel lug nut torque, both while the trailer is new, and throughout the trailer's life. Trailer wheels may carry higher loads per wheel than passenger car or truck wheels. Each wheel may carry from 1000 to 3750 pounds. Furthermore, wheels on tandem axle trailers do not steer, and are subjected to high side load stress as you go around corners - especially slow, tight ones - the wheels on your trailer are subjected to these side loads. This tends to flex the wheel and may gradually loosen the wheel lug nuts.

**It is critical that the wheels be properly torqued** during the first 10, 25 and 50 miles of road operation, or after any service or maintenance that requires the removal of a wheel. Although the wheels have been properly torqued before leaving the manufacturing plant, settling and wearing in of components during the first few miles of operation may cause some loosening of the wheel lug nuts.

A torque wrench with adequate accuracy is available at most automotive tool stores. Use of a torque wrench can also reduce the effort required to tighten the wheel lug nuts.

**Before each trip and any time a wheel is replaced or removed for service**, be sure to tighten the wheel lug nuts, following the appropriate sequence, (Star Pattern), to the specified torque. If the wheel was replaced, check the torque again after 10, 25, and 50 miles. If you notice wheel wobbling or hear a rattling sound coming

## On the Road - continued

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from a wheel, especially at low speeds, a wheel lug nut may have come loose. This problem is usually caused by improper tightening or by faulty or damaged lug stud threads. If you have reason to believe a lug nut has come loose, safely stop the vehicle at the side of the road as soon as possible. Put up warning devices. Remove the hub caps or wheel covers, if equipped and check the tightness of all the wheel lug nuts. Tighten all lug nuts to the specified torque ft./lbs. If lug stud threads are damaged or faulty, get professional service help. Do not tow the trailer with missing lug nuts or faulty lug stud.

### **WARNING**

If not properly tightened, loose lug nuts can damage the stud and/or wheel. If driven in this condition for any extended period severe wheel damage could occur affecting the handling of your trailer.

### **NOTE**

Use a torque wrench to tighten lug nuts. Tightening by hand or with an impact wrench is not recommended.

### **WARNING**

Under or over torque of wheel lug nuts can cause the wheel to separate from the axle and could lead to property damage, serious injury or loss of life.

### **NOTE**

It is the customers responsibility to follow these important safety instructions. Following these important instructions will help ensure wheel lug nut torque is properly maintained on your recreational vehicle.

### **WARNING**

Proper torque of lug nuts can only be achieved by using a "Torque Wrench" and a socket of adequate size for the application. Do not use a Flexible extension, a four way wrench or any other type of wrench that does not measure the actual force applied to the lug nut fastener.

### **WARNING**

Never apply paint or lubricants to the lug nuts, studs, or mating surface of the wheel or hubs on your axles.

## Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMENDED TORQUE
Steel Wheel 14 X 5.5 X 545 AW	SPOKE	14	80 - 90 FT./LBS.
Steel Wheel 15 X 5 X 545 AW	SPOKE	15	80 - 90 FT./LBS.
Steel Wheel 15 X 6 X 655	SPOKE	15	80 - 90 FT./LBS.
Alum Mod 14 X 5 MOD BRWH	ALUMINUM	14	125 - 135 FT./LBS.
Alum Spk 15 X 5 T02	ALUMINUM	15	125 - 135 FT./LBS.
Alum Spk 16 X 8 T02	ALUMINUM	16	125 - 135 FT./LBS.
Alum Mod 15 X 6 MOD	ALUMINUM	15	125 - 135 FT./LBS.
Alum Mod 16 x 8 MOD BRWH	ALUMINUM	16	125 - 135 FT./LBS.

### PRE-DEPARTURE SAFETY CHECK LIST

Before driving, make sure your vehicle and trailer maintenance is current. This is very important because towing puts additional stress on the tow vehicle.

- Check and correct tire pressure on the tow vehicle and trailer.
- Make sure the wheel lug nuts on the trailer are tightened to the correct torque.
- Be sure the hitch, coupler, draw bar, and other equipment that connect the trailer and the tow vehicle are properly secured and adjusted.

## On the Road - continued

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- Check that the wiring is properly connected - not touching the road, but loose enough to make turns without disconnecting or damaging the wires.
- Make sure all running lights, brake lights, turn signals, and hazard lights are working.
- Verify that the brakes on the tow vehicle and trailer are operating correctly.
- Check that all items are securely fastened on and in the trailer.
- Be sure the trailer jack, tongue support, and any attached stabilizers are raised and locked in place.
- Check load distribution to make sure the tow vehicle and trailer are properly balanced front to back and side to side.
- Check side and rear view mirrors to make sure you have good visibility.
- Check routes and restrictions on bridges and tunnels.
- Make sure you have wheel chocks and jack stands.

## TIRE AND CARGO INFORMATION

### INTRODUCTION

Beginning with vehicles and trailers under 10,000 pounds produced in September 2005 the National Highway Traffic Safety Administration is requiring the phase in of improved tire sidewall identification markings a new cargo/tire information placard and supplemental tire information to be included to manufacturers owner's manuals.

The sections which follow consist of excerpts from the NHTSA publication "Tire Safety - Everything Rides On It", instructions on how to determine the amount of cargo permissible for your trailer.

The new trailer placard, which discloses the trailer capacity weight, can be found near the existing Federal Certification Label at the left front sidewall of your trailer.

The placard will indicate the amount of cargo weight, which can be safely applied to your trailer. Even though this rating is not exceeded when you load your trailer, the loading and weighing instructions found in your owner's manual must be followed. Refer to the "on the road" section on trailer loading in your owner's manual.

To determine the exact amount of cargo which can be loaded, the following should be noted:

- Propane, the calculated weight of Propane, which feeds the various on board appliances, has been added to reduce the cargo rating (Propane cylinders equipped are assumed full).

All other loose items added by the consumer, as well as fresh water, are considered to be cargo.

It should be noted that any other add-on items not supplied by Outdoors RV nor installed by Outdoors RV will reduce the amount of cargo which can be carried.

On trailers equipped with the trailer placard, selling dealers are required by law to apply a new placard with an adjusted cargo rating to account for the reduction of permissible cargo due to added items by the dealer or equipment installer. If you are uncertain about the accuracy of the placard, contact your dealer directly or contact Outdoors RV for assistance.

## On the Road - continued

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It is the ultimate responsibility of the user to correctly load the trailer, distribute the weight appropriately and not exceed the placard cargo rating disclosed. Instructions on how to properly accomplish this are disclosed in the "on the road" section of the owner's manual.

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 of the trailer.
  - 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
- Trailer 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 cargo capacity
  - C. Determining compatibility of tire and trailer load capabilities
  - D. Adverse safety consequences of overloading on handling and stopping on tires.

Section 2 contains "Steps for Determining Correct Load Limit".

### SECTION 1

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 website:

[http://www.nhtsa.dot.gov/cars/rules/TireSafety/ridesonit/tires\\_index.html](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 trailer load limits (not carrying more weight in your trailer than your tires or trailer 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 trailer 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 trailer 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 trailer. Under inflated tires and overloaded trailers 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 trailer load limits, avoid road hazards, and regularly inspect your tires.

## **Finding Your Trailer's Recommended Tire Pressure and Load Limits**

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

- Recommended tire size
- Recommended tire inflation pressure
- Trailer capacity weight (TCW - the maximum occupant and cargo weight a trailer 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 trailer without moving any part of the trailer.

## **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 trailer. The tire inflation pressure number 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 trailer information placard expressed in kilopascals (kPa), which is the metric measure used internationally.

Trailer manufacturers determine this number based on the trailer's design load limit, that is, the greatest a trailer can safely carry and the trailer's tire size. The proper tire pressure for your trailer is referred to as the amount of weight "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 trailer, 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 trailer's tire pressure, including the spare, 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 under-inflation by visual inspection

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

The recommended tire inflation pressure that trailer 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 trailer's tire information placard, certification label.
- 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 under inflated.
- Step 6: Check all the tires to make sure they have the same air pressure.

If you have been towing your trailer and think that a tire is under inflated, fill it to the recommended cold inflation pressure indicated on your trailer's tire information placard or certification label. While your tire may still be slightly under inflated due to the extra pounds of pressure that is slightly lower than the trailer manufacturer's recommended cold inflation pressure than to drive with a significantly under inflated 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. Make sure any leaks are repaired promptly by a qualified shop.

### Tire Size

To maintain tire safety, purchase new tires that are the same size as the trailer'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 trailer 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 tread wear 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

To avoid vibration or shaking of the trailer 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. Special equipment is used and the balance must 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**

**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%. Contact your local tire dealer.

**Next number** - This three digit number gives with 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. Note: You may not find this information on all tires because it is not required by law. Contact your local tire dealer.

**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 Rating Speed Rating

Q	99 mph
R	106 mph
S	112 mph
T	118 mph
U	124 mph
H	130 mph
V	149 mph
W	168* mph
Y	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 customers 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.



## On the Road - continued

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**Additional Information on Light Truck Tires** - 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 trailer). Note: Not applicable to RV trailers.

**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. Note: Applicable to RV trailers.

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

### Trailer Load Limits

Determining the load limits of a trailer 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 trailer's gross weight rating (GVWR). This is the most weight the fully loaded trailer can weigh. It will also provide the gross axle weight rating (GAWR). This is the most weight a particular axle can weigh. If there are multiple axles, the GAWR of each axle will be provided.

### Cargo Capacities

Cargo can be added to the trailer, 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 trailer 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 trailer within the limits of the GVWR so as not to overload the trailer. 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 trailer 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 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 trailer'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 trailer is hard to tow 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 under-inflation 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.

## **On the Road - continued**

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It is the air pressure that enables a tire to support the load, so proper inflation is critical. Since RV's can be configured and loaded in many ways, air pressures must be determined from actual loads (determined by weighing) and take 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 the 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 valve stems have valve caps.
- Check tire pressure before going on a long trip.
- Do not overload your trailer. Check the Tire Information Loading Placard or User's Manual for the maximum recommended load for the trailer.

## **SECTION 2**

### **STEPS FOR DETERMINING CORRECT LOAD LIMIT**

- 1) Locate the statement "The weight of cargo should never exceed XXX lbs" on your vehicles placard.
- 2) This figure equals the available amount of cargo and luggage capacity.
- 3) Determine the combined weight of luggage and cargo being loaded on the trailer. That weight may not safely exceed the available cargo and luggage load capacity.

### SETUP

This section outlines the procedures necessary to stabilize and setup your trailer.

Before attempting to setup the trailer, carefully read and understand these instructions. Setting up your trailer is not difficult but does require some forethought and care.

Your trailer is designed to be efficient and comfortable. Careful attention to details and thoroughness during setup will ensure that you will benefit from all the features and comfort built into your trailer.

During storage or after your trailer has been setup, you may notice slight rippling or waviness of the aluminum or fiberglass exterior sidewall panels. This is caused by the normal expansion and contraction of the materials as they warm up and cool down.

### LEVELING AND STABILIZATION

Leveling of your trailer at the site is important. A level trailer is not only necessary for comfort but your refrigerator must be level in order to operate properly.

Stabilization is recommended to keep the trailer from bouncing while unhitched when people are moving inside the trailer.

Stabilizer jacks are intended to stabilize the trailer body while the trailer's full tongue weight is supported by the hitch jack (conventional trailers) or landing gear (fifth-wheel trailers) and running gear. Stabilizer jacks are not designed to lift or level the trailer or support its entire weight. If your trailer is not factory-equipped with stabilizer jacks, be sure the jacks you use are load rated for the weight they will support. Optional permanently mounted stabilizer jacks are available on most models and are located near each corner.

### Leveling Procedures for a Conventional Trailer

1. If the site is not an asphalt pad, concrete slab or other prepared surface, be sure it is as level as possible. Be sure the ground surface is not soft and will support the weight of the trailer on the stabilizing jacks or other support devices.
2. Before uncoupling, level the trailer from side to side with suitable lengths of 2" x 6" wood blocks under forward of the trailer wheels, and tow the trailer onto the 2" x 6" blocks. Block the trailer wheels so the trailer cannot roll.
3. Put the foot pad on the hitch jack post, uncouple the trailer from the tow vehicle and level the trailer front to rear. It may be necessary to place a sturdy 2" x 6" wood block or equivalent under the jack post foot pad to support to support the jack post on soft ground surfaces.
4. To assure reasonable level at the refrigerator, use a round bubble or carpenters level, inside the refrigerator.

## Living with your Trailer - continued

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5. Lower the factory installed stabilizer jacks (if equipped) at the front and rear or position stabilizer jacks under the main frame rails, two or three feet in from the front and back. Adjust each jack to a snug, tight fit. Sturdy wood blocking or equivalent may be required to provide supporting area on the ground.
6. After stabilizing the trailer, be sure the trailer frame is not twisted, buckled, or stressed. Check that all doors and windows operate freely and do not bind.
7. Before resuming travel, be sure all stabilizer jacks are removed or fully retracted.

**▲ CAUTION**

After-market stabilizer stands must be placed only under chassis frame rails.

**▲ WARNING**

Do not use the stabilizer jack(s) as a tire changing jack.

**▲ WARNING**

Use only the handle provided with the stabilizer jack. Do not use any kind of "cheater" bar on the handle.

**▲ WARNING**

Do not attempt to use the stabilizer jack(s) to level the trailer, lift the weight of the trailer, raise the tires off the ground, or otherwise place all the weight of the trailer on the stabilizer jacks. Damage to the trailer frame and/or door jamb(s) may occur.

### Leveling Procedures for a Fifth-Wheel Trailer

1. If the site is not an asphalt pad, concrete slab or other prepared surface, be sure it is as level as possible. Be sure the ground surface is not soft and will support the weight of the trailer on the stabilizing jacks or other support devices.
2. Before unhitching, level the trailer from side to side with suitable lengths of 2" x 6" wood blocks under the trailer tires. Place the 2" x 6" wood blocks on the ground surface forward of the trailer tires and tow the trailer onto the 2" x 6" blocks. Block the trailer tires so the trailer cannot roll.
3. Lower the "quick drop" landing gears before extending the landing gear. The positioning of the "quick drop" legs will depend upon how level your campsite is from side to side and front to rear. The landing gear is then extended either mechanically (hand crank) or by the optional power motor. It may be necessary to place a sturdy 2" x 6" wood block or equivalent under the foot pads to support the landing gear on soft ground surfaces.

4. To assure reasonable level at the refrigerator, use the round bubble level inside the refrigerator. Acceptable level is when the bubble is within the marked area of the bubble level.
5. Lower the factory installed stabilizer jacks (if equipped) at the rear of the trailer or position stabilizer jacks under the main frame rails, two or three feet in from the rear. Adjust each jack to a snug, tight fit. Sturdy wood blocking may be required to provide supporting area on the ground.
6. The king pin area can be stabilized with a king pin stabilizer jack optional for fifth-wheels.
7. After stabilizing the trailer, be sure the frame is not twisted, buckled, or stressed. Check that all doors and windows operate freely and do not bind.
8. Before resuming travel, be sure all stabilizer jacks are removed or fully retracted.

**▲ CAUTION**

**Do not operate the power landing gear with crank handle engaged.**

**▲ CAUTION**

**After-market stabilizer stands must be placed only under chassis frame rails.**

**▲ WARNING**

**Do not use the stabilizer jack(s) as a tire changing jack.**

**▲ WARNING**

**Use only the handle provided with the stabilizer jack. Do not use any kind of "cheater" bar on the handle.**

**▲ WARNING**

**Do not attempt to use the stabilizer jack(s) to level the trailer, lift the weight of the trailer, raise the tires off the ground, or otherwise place all the weight of the trailer on the stabilizer jacks. Damage to the trailer and/or door jambs may occur.**

### **Units with Slide-Out Rooms**

The slide-out room(s) are designed to provide additional living space.

There are several types of slide-outs available as standard or optional equipment on your trailer. Refer to the **Slide-Out** section of the **Equipment** chapter for proper setup and operation.

Remove all travel locks before operating the slide-out, and replace them before moving the trailer.

**▲ CAUTION**

**Never attempt to move your trailer with the slide-out room(s) extended. Damage can occur to the slide-out or the trailer.**

## EFFECTS OF LONG TERM OCCUPANCY

### Condensation and How to Control It

Your need to understand how to properly manage and control the humid conditions and condensation that you may experience.

RVs are much smaller than a house, and are tightly built. This means that the interior air will become saturated with moisture more quickly than a typical house. The routine activities of a few people can put a lot of water into the air. In cold weather, this moisture may become visible as condensation.

Condensation happens naturally. Just as moisture collects on the outside of a glass of cold water during humid weather, moisture can condense on the inside surfaces of your RV during cold weather when the humidity of the interior air is high.

Water vapor will condense on the inside of the windows and walls. In really cold weather, frost or ice may appear. ***It may also condense out of sight within the walls or ceiling.*** If enough water collects in the wall or ceiling materials, it may cause water stains on the wall or ceiling surface. You might think that your walls or ceiling are leaking. You have a problem with condensation if you see these signs. You need to do something to reduce the moisture inside your RV.

<b>▲ Note</b>
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Your trailer is not designed to be used as permanent housing. Use of this product for long term or permanent occupancy may lead to premature deterioration of structure, interior finishes, fabrics, carpeting and drapes. Damage or deterioration due to long term occupancy may not be considered normal, and may under the terms of the warranty constitute misuse, abuse, or neglect, and any therefore reduce your warranty protection.

Here are some frequently asked questions about condensation and some answers that will help you understand more about your RV and how to keep it comfortable.

**Q. - In cold weather, my windows and walls look like they're sweating. Is that condensation?**

**A. -** Yes. Your windows are a good way to know if the humidity in your RV is too high. All air contains water vapor. When air is warm it can hold much more water vapor than when it is cold. When the air cools, the water vapor "condenses" back to a liquid. Since your windows are usually cooler than the air, the water collects on the surface of the glass.

**Q. - Where does all the water come from?**

**A. -** Moisture in the air comes from many sources. Some of the most common are:

**Cooking** - Meals prepared for a family of four can add up to a gallon of water per day into the air from cooking.

**Bathing** - An average shower can put between 1/4 - 1/2 pound of water into the air.

**Dishwashing** - Doing the dishes for a typical day's meals can add up to one pound of water into the air.

**Floor mopping** - When an 8' x 10' kitchen floor is mopped and rinsed, almost 2 1/2 pounds of water can be released into the air.

**Clothes drying** - After 10 pounds of clothes have been washed and spin-dried in a washer, they still contain about 10 pounds of water. If these clothes are dried inside, that water is released into the air in the RV.

**Propane appliances** - When Propane is burned, carbon dioxide, nitrogen and water are given off into the air. For every 1000 cubic feet of Propane burned, nearly 88 pounds of water is released into the air.

**Humidifiers** - Humidifiers are designed to put moisture into dry air - up to two pounds per hour. So in a 24-hour period, an uncontrolled humidifier can put almost 50 pounds of water into the air.

**House plants and aquariums** - Plants give off almost as much water as you put on them. Open aquariums permit higher rates of evaporation than closed types.

**People and animals** - A large source of water in the RV is the inhabitants themselves. A family of four can put up to 12 pounds of water into the air per day through breathing and perspiration.

As you can see. Just the normal course of living adds a great deal of water to the air.

**Q. - What will all this water do to my RV?**

**A. -** The least it will do is for your windows. If it is really cold outside, frost or even clear ice could form on the inside of the glass.

Excessive moisture in the air could show up as water running down or dripping off walls, ceilings or fixtures. It may look like your roof or windows are leaking. This water may stain woodwork, carpeting, ceiling panels or even furniture.

But the most damage is caused by water you can't even see. Water will penetrate almost any material - except glass and metals. Water vapor in the air always wants to move toward dry air. Scientists call this "vapor pressure" action. It will go through walls, floor covering, plywood, paint - just about anything. The water that gets trapped in these materials can cause warping, mildew, paint failure and rotting.

The damage caused by excessive humidity can be invisible, and worse, expensive to fix. Please remember that this damage is not covered under the warranty.

**Q. - What can I do to reduce or eliminate condensation problems in my RV?**

**A. -** The two most important things are:

***Reduce moisture released into the air and increase ventilation***

**To reduce moisture released inside the RV:**

1. Run the vent fan when cooking and the bath vent fan (or open the bath vent) when bathing.
2. Avoid making steam from excessive boiling or use of hot water.
3. Remove water or snow from shoes entering to avoid soaking the carpet.

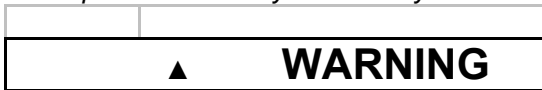
4. Avoid drying clothes inside (except in the dryer, if equipped). The water drying out of the clothes goes into the air.
5. Vent appliances to the outside. Your clothes dryer should always be vented according to the dryer manufacturer's installation instructions, if required. (Some dryers are designed to be ventless and do not require a vent to the outdoors.) Check the vents periodically to be sure they are not blocked.
6. If you operate or use vaporizing inhalers, or similar devices, always provide adequate ventilation.

**To increase ventilation:**

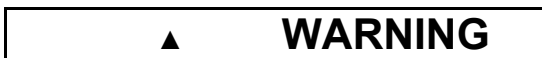
1. Use the kitchen and bath exhaust fans, if equipped, when cooking or bathing. Let them run for a while after a bath or meal.
2. Ventilate with outside air. Partially open one or more roof vents and/or windows to provide circulation of outside air into the interior. While this ventilation will increase furnace heating load, it will greatly reduce, or eliminate, condensation. Even when it is raining or snowing, outside air will be far drier than interior air and will effectively reduce condensation.
3. Do not tape windows or doors closed. This will prevent any air movement and will make the condensation problem worse.
4. Ventilate closets and cabinets. During use in cold weather, leave cabinet and closet doors partially open to warm and ventilate the interiors of storage compartments built against exterior wall. The air flow will warm the exterior wall surface, and reduce condensation, and prevent possible ice formation. Avoid crowding closets or wardrobe space. Overstuffed closets restrict air flow.
5. Stock kitchen and bath cabinets to allow free air circulation.
6. Open window coverings and windows as often as possible and convenient.
7. Control the interior heat. Here are some tips on controlling humidity with heat:

*\* Keep registers and the furnace blower clean and unobstructed. This helps air circulation.*

*\* Do not operate a humidity device on your furnace.*



Do not heat the trailer interior with the range or oven. Open flames add moisture to the interior air. Do not use an air humidifier inside the RV. Water put into the air by the humidifier will increase condensation.



Never use open flame gas or kerosene-burning heaters indoors. These devices release water into the air, and the exhaust gases contain poisonous substances.





## WARNING

Do not cover emergency exit window(s). This window must be left accessible at all times for emergency exit.

### Dripping Ceiling Vents

During cold weather, condensation frequently forms on ceiling vents and may even accumulate to the point of dripping onto the surfaces below. This is frequently misinterpreted as a "leaking" roof vent but is most often condensation drippage. Follow the preceding steps to control moisture condensation, and protect surfaces with plastic sheeting until the moisture has dissipated.

### IMPORTANT INFORMATION

Mold is a fungus that occurs naturally in the environment and serves necessary functions including aiding in the decomposition of plant and other organic material. Mold spreads by means of microscopic spores borne on the wind and is found everywhere life can be supported. Mold has existed for millions of years, and human beings have coexisted despite their exposure to mold and mold spores.

If the proper conditions are present, mold can and will grow in your recreational vehicle. Most RV owners are familiar with mold growth in the form of bread and cheese and on bathroom tile. In order to grow, mold requires a food source. These food sources might be supplied by items found in the RV such as fabric, carpet, wallpaper, or building materials (i.e., wood, and insulation). Also, most mold growth requires a temperate climate. The best growth occurs at temperatures between 40 degrees F and 100 degrees F. Most importantly, mold growth requires moisture, and moisture is the only growth factor that can be controlled. By minimizing interior sources of moisture, an RV owner can reduce or prevent mold growth. However, if optimal growth conditions persist, mold can develop within 24 to 48 hours.

Moisture in the RV can stem from a variety of sources such as spills, leaks, overflows, condensation, damp or standing water and human activity such as showering or cooking. Good maintenance practices are essential in the effort to prevent or reduce mold growth.

### What the RV Owner Can Do

The RV owner can take positive steps to reduce the occurrence of mold growth in the RV and thereby minimize any possible adverse effects that may be caused by mold.

These steps may include, but are not limited to, the following:

- \* Before bringing items into the RV check for signs of mold. Potted plants (root and soil), furnishings, or stored clothing and bedding materials may also contain mold spores.
- \* Regular vacuuming and cleaning will help reduce levels of settled mold spores. Additionally, detergent solutions and most tile cleaners are effective in controlling mold growth on surfaces.
- \* Keep the humidity in the RV below 40%. Ventilate kitchens and bathrooms by opening windows, using exhaust fans, or running the air conditioning to remove excess moisture in the air and to facilitate evaporation of water from wet surfaces. In general, windows or doors through-out the RV should be opened periodically to ventilate the RV.

## Living with your Trailer -continued

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- \* Promptly clean up spills, condensation, and other sources of moisture. Thoroughly dry any wet surfaces or material. Do not let water pool or stand in or under your RV.
- \* Inspect for leaks on a regular basis. Look for discolorations or wet spots. Repair any leaks promptly. Inspect condensation pans (refrigeration and air conditioners) for mold growth. Take notice of musty odors and any visible signs of mold growth.

Other actions the RV owner can take to prevent moisture issues include the following:

- \* Do NOT use unvented Propane, kerosene, or other unvented combustion heaters;
- \* Do NOT cover or close off the floor registers (if equipped);
- \* Check your cooling equipment filter on a monthly basis;
- \* Use the air conditioner or a dehumidifier during humid months, particularly during the summer in hot, humid climates;
- \* Use exhaust fans in kitchen and bathrooms to remove excess moisture;
- \* Clean the bathroom with mold-killing products

For more information about mold, and what you can do to reduce moisture and remediate mold growth in your RV, please refer to the following websites and literature:

1. US, Environmental Protection Agency. Mold Remediation in Schools and Commercial Buildings 2001.  
<http://www.epa.gov/iaq/molds/moldremediation.html>
2. U.S. Environmental Protection Agency. A Brief Guide to Mold, Moisture, and Your Home, 2002.  
<http://www.epa.gov/iaq/molds/moldguide.html>

<b>▲      WARNING</b>
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**This product is manufactured with urea-formaldehyde resin. Formaldehyde vapor may in some people cause headaches, eye, nose and throat irritation, and aggravation of allergies and respiratory problems, such as asthma. Proper ventilation should reduce the risk of such problems.**

<b>▲      WARNING</b>
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**This product is manufactured with a urea-formaldehyde resin and will release small quantities of formaldehyde. Formaldehyde levels in the indoor air can cause temporary eye and respiratory irritation, and may aggravate respiratory conditions or allergies. Ventilation will reduce indoor formaldehyde levels.**

▲ **WARNING**

**Irritant:** This product contains a urea-formaldehyde resin and may release formaldehyde vapors in low concentrations. Formaldehyde can be irritating to the eyes and upper respiratory system of especially susceptible persons such as those with allergies or respiratory ailments. Use with adequate ventilation. If symptoms develop, consult your physician.

**IMPORTANT INFORMATION**

The particle board, hardwood plywood, or paneling used in your RV are made with urea-formaldehyde resin. The companies that supply us with these materials have asked that we tell you about urea-formaldehyde with the statements on this page.

Ventilation is important for making the interior of your RV comfortable. Please read the section about ventilation and prolonged occupancy in the *Living With Your Trailer* chapter in this *Owner's Manual*.

We provide you consumer information as detailed by the National Fire Protection Association (NFPA) and the American National Standards Institute (ANSI). The information and warnings found on these pages may also be found in other chapters of this *Owner's Manual*. Please see the *Propane System* and *Appliances* chapters for other safety and operating information.

**FIRE SAFETY**

The hazard and possibility of fire exists in all areas of life, and the recreational life-style is no exception. Your RV is a complex machine made up of many materials, some of them flammable. But like most hazards, the possibility of fire can be minimized, if not totally eliminated, by recognizing the danger and practicing common sense, safety and maintenance habits.

Know where your fire extinguisher is located and how and when to use it. Read the instructions on the fire extinguisher. Remember that portable fire extinguishers are intended for use by the occupants of a building or area that is being threatened by fire. They are most valuable when used immediately on small fires. They have a limited amount of fire-extinguishing material, and therefore must be used properly so this material is not wasted.

Fire extinguishers are pressurized, mechanical devices. They must be handled with care and treated with respect. They must be maintained as outlined in any maintenance instructions provided with the device so they are ready to operate properly and safely. Parts or internal chemicals may deteriorate in time and need replacement. Always follow maintenance and recharging instructions provided by the fire extinguisher manufacturer. Maintain proper charge in the fire extinguisher.

▲ **WARNING**

**Urethane foam is flammable!**

**Do not expose urethane foams to open flames or any other direct or indirect high temperature sources of ignition such as burning operations, welding, burning cigarettes, space heaters or unprotected electric light bulbs.**

Once ignited, urethane foams will burn rapidly, releasing great heat and consuming oxygen very quickly.

In an enclosed space the resulting deficiency of oxygen will present a danger of suffocation to the occupants. Hazardous gases released by the burning foam can be incapacitating or fatal to human beings if inhaled in sufficient quantities.

## FIRE SAFETY PRECAUTIONS

In addition to instructing occupants on what to do in case of fire, and holding fire drills periodically, consider these fire safety suggestions:

- \* If you experience a fire while traveling, ***maintain control of the vehicle until you can safely stop. Evacuate the vehicle as quickly and safely as possible.***
- \* Consider the cause and severity of the fire and risk involved before trying to put it out. If the fire is major or it is fuel-fed, stand clear of the vehicle and wait for the fire department or other emergency assistance.
- \* If your RV is damaged by fire, do not move or live in it until you have had it thoroughly examined and repaired.

Just as in your home, included below are some common sense tips to help prevent a fire incident from occurring.

- \* Never leave unattended food cooking on the stove or in the oven.
- \* Never smoke in bed or leave cigars/cigarettes unattended.
- \* Keep candles or any open flames away from curtains/fabrics/walls and ceiling.
- \* Do not store combustibles inside your RV (gasoline, charcoal lighter, etc.).



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

## DAY / NIGHT SHADES (If Equipped)

The day / night shades are dual-purpose window covering that provide privacy at night and light control during the day.

### To Lower shades:

Using both hands, gently pull down on the lower bar to expose the sheer fabric for daytime light control. For use at night, pull on the upper bar to unfold the privacy curtain.

### To Raise shades:

Using both hands, gently raise the upper bar allowing the sheer fabric to fold, then raise the lower bar allowing the privacy curtain to fold.

## MINI-BLINDS (If Equipped)

### To Lower mini-blinds:

Pull straight down on the cord slightly, and move it about 45 degrees to either the left or right and lower the blind. Stop the blind in mid-travel by moving it back to the straight down position. Re-attach the retainers when traveling.

### To Raise mini-blinds:

Release bottom of the blind from retainer. Pull straight down on cord and release at desired height. It is not necessary to pull the cord to one side or the other to secure blind.

### To Adjust the angle:

Turn the adjusting rod either direction.

## STORAGE

### Exterior Compartments

Exterior storage compartments should accommodate most of your storage needs. All of the storage compartments, except the Propane tank compartment, can be locked. Fire prevention regulations require that the Propane tank compartment be unlocked at all times.

Please note: Your RV could be overloaded or put out of balance if not properly loaded. Refer to the **Travel Trailer Loading** section of the **On The Road** chapter of this manual, and follow the loading and weighing instructions in that section. When storing equipment and supplies:

- \* Always keep tools and equipment stored in areas where they will not shift while traveling.
- \* Whenever possible, place heavy articles in storage compartments which are low and in the best location for weight distribution. Pack articles carefully in the storage compartments to minimize shifting. If necessary, use straps to prevent movement.
- \* Be sure liquid containers are capped and cannot tip or spill.
- \* Secure all glass containers and dishes before traveling.
- \* Exterior storage compartments may not be watertight in all conditions. Carry any articles which could be damaged by water inside the RV.

<b>▲      WARNING</b>
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**Do not store flammable, volatile liquids or hazardous chemicals inside the RV or in outside storage compartments. Toxic fumes from these liquids or chemicals may enter the interior of the RV.**

## INTERIOR STORAGE

The closets and cabinets have catches along one edge of the door. Pull on the cabinet door handle to open. Overhead doors have supports to hold them open. The drawers have a catch along the edge of the drawer. Pull the drawer handle to open.

Closets may be equipped with 12-volt lights that turn ON when the closet door is opened. Be sure the light goes OFF when the closet door is closed -- your battery will be discharged if it stays ON. If the light stays on when the door is closed, the door switch requires adjustment.

### ▲ WARNING

Explosive fuel clouds may be present at fuel filling stations. **Before refueling (either gasoline, diesel fuel or Propane) be sure to turn off all pilot flames and appliances in your RV. Turning off the Propane at the tank is insufficient. Pilotless appliances may still spark or pilot flames may not extinguish immediately.**

### ▲ WARNING

Any motorized vehicle or any motorized equipment powered with flammable liquid can cause fire, explosion, or asphyxiation if stored or transported within the recreational vehicle. To reduce the risk of fire, explosion, or asphyxiation:

1. Do not allow passengers to ride inside internal combustion engine storage area while vehicles are present.
2. Occupants shall not sleep in the vehicle storage area while vehicles are present.
3. Doors and windows in walls of separation are to be closed while the vehicles are present.
4. Run the fuel out of engine(s) after shutting off fuel at the tank.
5. Motor fuel shall not be stored or transported inside the vehicle.
6. Ventilate the interior of the vehicle to reduce the risk of fire, explosion, or asphyxiation.
7. Do not operate Propane appliances, pilot lights or electrical equipment when motorized vehicles or motorized equipment are inside vehicle.

### ▲ WARNING

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

## PULL SHADES (If Equipped)

### To Lower shades:

Gently pull the shade down to the desired height.

### To Raise shades:

Gently pull the bottom of shade until the spring tension from the roller is felt, allowing shade to raise to desired height.

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## Chapter 6 Plumbing Systems And Holding Tanks

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The plumbing systems in your trailer are constructed of durable thermoplastic materials. Holding tanks and piping components are strong, lightweight, and corrosion resistant.

Holding tanks are of three types:

1. **Fresh** - Fresh potable water
2. **Grey** - Lavy/shower effluent
3. **Black** - Toilet effluent

It is recommended to discharge as many fluid tanks as practical before driving.

<b>▲ Warning</b>
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Holding tanks are enclosed sewer systems and as, such must be drained into approved dump station. Both black and grey water holding tanks must be drained and thoroughly rinsed regularly to prevent accumulation of harmful or toxic materials.

### External Fresh Water Hookup

The external system is pressurized by the water system at the RV park or city water supply. The connection is located on the road side of the trailer.

#### To connect to pressurized city water:

1. Connect one end of a potable water hose to the RV park or city water supply. This will usually be a faucet or valve similar to your garden hose valve at home. Potable water hoses are available at RV supply stores.
2. Run the city water supply for a few seconds to clear the line. Turn off the water.
3. Attach either end of the potable water hose to city water connection located on the trailer. Make sure all connections are tight.
4. Turn on the RV park/city water supply. Open all faucets inside the trailer to clear the lines. Then turn off faucets.

#### To disconnect the city water:

1. Turn OFF the city water supply.
2. Remove the hose from the city water supply.
3. Drain and store the hose.

### Filling the On-Board Water Tank

1. Gravity fill - The external tank fill is located on the exterior of the trailer. The on-board water tank can be filled here. To fill the fresh water tank, remove the cap, remove the vent plug, and fill the tank using a potable water hose.



<b>Caution</b>
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**Never over fill the on board Fresh Water Tank. Damage from overfilled water tank can occur.**

## Plumbing System cont.

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**Never allow the water tank to be filled unattended. Damage caused by overfilling of fresh water tank is considered misuse and is not covered by Outdoors RV warranty.**

**Since water pressure at campgrounds vary, we recommend you install an in-line pressure regulator at the water supply faucet. This will protect the trailer water system and your supply hose from excessively high water pressure.**

### Draining the Fresh Water Tank

Avoid leaving the water in the tank when the trailer is not in use. Turn the water pump OFF before draining the water tank. Whenever possible, drain the fresh water tank before traveling. Water in the tank will reduce the carrying capacity of the trailer. See **Trailer Loading** section of **On The Road** chapter.

The main water tank drain plug is located under the trailer at the water tank location.

### Water Pump

The on-board fresh water system is pressurized by a self-priming, 12 volt DC pump. The pump operates automatically when the pump power switch is ON and a faucet is opened. When the faucets are closed, the pump shuts off. A fuse at the converter panel protects the pump circuit. It can run dry for extended periods without damage. See **Electrical Systems** chapter.

Turn the pump master switch ON to pressurize the system. When a faucet is opened after the initial filling of the tank, the water may sputter for a few seconds. This is normal and is not cause for concern. The water flow will become steady when air is bled from the water lines.

### Water Pump Filter

Dirt, mineral scale, and organic matter are filtered out of the fresh water system by an in-line water filter on the inlet side of the water pump. If you suspect a clogged filter, it is easily removed and cleaned.

Inspect the filter after running the first full tank of water. Clean and inspect monthly thereafter. The filter is located in the utility compartment behind the service panel.

1. Clamp flexible supply line to the pump before disconnecting to prevent water running out of the line.
2. Loosen the clamp at the inlet end of the filter.
3. Pull the water line off the filter.
4. Unscrew the filter from the water pump.
5. Turn each end of the filter and pull apart.
6. Flush out and clean screen.
7. Reverse procedure to install.
8. Operate the water pump and check for leaks.



## Plumbing System - continued

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### Low Point Drains

#### To drain hot and cold lines:

1. Open hot and cold low point drains.
2. Open the shower handle and faucet until all water has drained from the lines.

### Troubleshooting the Fresh Water System

Water system problems usually fall into two categories: Inherent system problems, and problems caused by neglect. System problems are usually the result of road vibration and campsite water pressure variations. Problems of neglect usually stem from filter failures, improper winterization, and poor battery maintenance. Most water system problems can be avoided by conscientious maintenance.

### Leaks

Vibration, flexing and twisting while traveling can work pipe fittings loose. Check all plumbing for leaks at least once a year. If water pump runs when faucet is not open, suspect a leak. Be sure the drain valves are tightly closed. Leaks occur most often around threaded fittings. If necessary, tighten or clean and tighten the fittings. Do not over tighten fittings. Connections at galley and lavatory fixtures should be tightened with a wrench. They normally seal with hand-tightening. If a leak persists at one of the fittings, disconnect it completely and check for mineral deposits or foreign matter at the seating surface. Clean the surfaces thoroughly and reinstall the fitting.

Connections at the water tank, pump and valves are made with special clamps. They can be replaced with standard automotive type hose clamps.

Leaks caused by freezing damage can be prevented by proper winterization of the system. See the **Storage** chapter of this manual. Freezing damage is usually extensive and may include a burst water tank, split piping, and a damaged water pump, toilet, and water heater. If you experience this type of damage, repairs can best be made by an authorized Outdoors RV dealer.

For your safety, the shower faucet is equipped with a vacuum breaker device. This device is designed to prevent backflow of water into the fresh water system, reducing the possibility of contamination of the water supply. When the faucet is in the OFF position with the shower hose held above the faucet water will drain out of the vacuum breaker. This drainage is not a defect, but indicates that the faucet is working correctly.

### Sanitizing the Fresh Water System

As approved by the U.S. Public Health Service, sanitize the fresh water tank and piping system whenever the system may have become contaminated, has not been used for a period of time, or before long periods of storage. This will discourage the growth of bacteria and other organisms that can contaminate the water supply. Use a chlorine/fresh water rinse as follows:

1. Prepare a solution of 1/4-cup household liquid chlorine bleach (5% sodium hypochlorite) to one gallon of water. Use one gallon solution for each 15 gallons of tank capacity.
2. Close drain valves and faucets, pour the chlorine solution into the exterior fresh water tank filler spout, and complete filling at tank with potable water.

## Plumbing Systems -continued

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3. Turn water pump switch ON. (Be sure you have 12-volt DC power.) Open all faucets individually until water flows steadily, then turn them off. This will purge any air from lines.
4. Top off water tank with fresh water and allow the system to stand for at least 4 hours.
5. Drain the entire system by opening all potable water tank valves, plumbing line drain valves, and operating faucets.
6. Flush the system with potable water. Let the fresh water flow through the system for several minutes to flush out the chlorine solution.
7. After you stop the flushing, close the tank valve, drain valves, and faucets. You can now fill the tank with potable water, and the system is ready to use.

### Drinking Water Filter System

(If equipped)

The water filter helps provide consistent drinking water quality. The filter cartridge is located in the cabinet under the galley sink. Your **Owner's Information Package** contains detailed operating and maintenance instructions concerning this system.

Please note that the separate faucet at the galley, and the optional icemaker are outlets for the filtered water. Although this filtered water is not available at standard galley and lavy outlets, the water available at those outlets is filtered by the water pump filter. Note also that this system is not designed for or effective in removing or neutralizing bacterial contaminants.

<b>▲ Note</b>
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**Turn water pump off before traveling. Road vibration could cause a faucet to open. If the water pump is on, your fresh water supply could be pumped into the inside of the tub or sink.**

### Whole Trailer Filter System

(If Equipped)

The water filter helps provide consistent drinking water quality to the entire water system. The filter cartridge is located in the service panel compartment. Your **Owner's Information Package** contains detailed operating and maintenance instructions concerning this system.

### Waste Water System

The waste water system in your trailer is made up of sinks, tub, shower, toilet, plumbing drain and vent lines, a "grey water" holding tank and a "black water" holding tank. The grey tank holds shower, tub and sinks, where the black tank holds toilet effluent. The holding tanks make the system completely self-contained and allow you to dispose of waste water at your convenience. A flexible sewer hose is required to connect the holding tank outlet to the inlet of an approved waste water dump station or sewer system.

The drain plumbing is very similar to that used in your home. The system is trapped and vented to prevent waste gases from backing up into the trailer. The drain plumbing is made of plastic, and is durable and resistant to most chemicals. All drain plumbing except the toilet connection terminates in the grey water holding tank and drains directly into it.

## Plumbing System -continued

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### Toilet

Your trailer is equipped with a marine-type toilet. The flushing mechanism, whether a foot-operated pedal or hand-operated lever, allows a valve in the bottom of the bowl to open, permitting the contents to be flushed into the "black" holding tank. A stream of water under pressure from the trailer water system swirls around the bowl, cleaning it and flushing the contents into the holding tank. Most models have two levers, each working independently of the other so the bowl can be filled with water prior to use.

In order to help prevent hard deposits from building up within the "black" tank and help reduce unwanted odor, it is recommended to always keep water in the tank. When empty after a tank discharge, flush the toilet several times in order to introduce about five gallons of water.

It is highly recommended that a deodorizing product should be used for the black tank after each discharge at a dumping station. This will help control odors.

Ensure that the black tank sewer drain system is always closed and only opened when draining at a dump station. **Never** allow your black tank system to dry out unless it has been thoroughly cleaned, sanitized and rinsed first.

For additional information, please refer to the operating manual in your **Owner's Information Package**.

### Drain the Holding Tanks

The holding tanks terminate in a valve arrangement that permits draining each tank separately. The valves are called knife valves. A blade-closes the opening in the sewer drain pipes. Pull the T-handle to release the contents of the tank(s).

During self-containment use, the sewer line is securely capped to prevent leakage of waste materials onto the ground or pavement. **Do not pull the holding tank knife valve open when the protective cap is installed on the pipe.** Always drain the tank into an acceptable sewer inlet or dump station.

Drain the holding tanks only when they are at least 3/4-full. This provides sufficient water to allow complete flushing of waste materials into the sewer line.

Whenever possible drain the holding tanks before traveling. Waste water and sewage in the holding tanks reduce the carrying capacity of the trailer. See **Trailer Loading** chapter.

During extended or semi-permanent hookups to sewage systems, waste materials will build up in the tank and cause plugging if the tank valves are continuously open. In these cases, keep the valves closed until tanks are 3/4-full, and then drain into sewer system.

The holding tank drain valve outlet is to be used with a removable termination fitting that locks onto the outlet with a clockwise twist. Clamp the sewer drain hose to this fitting. A protective cap should remain in place when you are not draining the tanks.



#### Note

**Local or state regulations may prohibit highway travel unless the holding tank outlet is securely capped.**

### To drain the holding tank:

1. Attach the sewer hose to the holding tank outlet. Insert the end of the hose into the sewer or dump station inlet, pushing it firmly far enough into the opening to be secure. In some cases, adapters may be necessary or required between the line and inlet. Arrange the sewer hose so it slopes evenly.
2. Drain the black water holding tank first. Grasp the handle of the black water knife valve (the large one) firmly and slide the valve open with a quick, steady pull.
3. Allow enough time for the tank to drain completely. Rinse and flush the tank through the toilet. When the tank is empty, push the handle in to close the valve. Run enough water (up to five gallons or so) into the tank to cover the bottom. This will aid the break up of solid wastes, and reduce "pyramiding" of waste material.
4. To drain the grey water tank, repeat the steps above using the small knife valve. This tank is drained last to aid in flushing the outlets and hose. The grey water knife valve may be left open in a semi-permanent hookup.
5. See the tank flush system instructions in the next section if your trailer is so equipped.
6. Remove the sewer hose and cap the outlet.
7. Rinse out the sewer hose with fresh water and remove the sewer hose from the dump station.
8. Replace sewer or dump station covers.

### Black Tank Flush System (If Equipped)

The black water holding tank is equipped with rinsing spray heads that will aid in the removal of sewage residue from the interior of the holding tank. To operate the tank flushing system, follow the procedure for **Draining The Holding Tanks** in this chapter. After dumping the grey water tank proceed as follows:

1. With the dump valves open, attach a garden hose to the black tank flush inlet connection.
2. Turn on water supply to garden hose and allow the water to run for approximately three minutes to flush tank.
3. Turn off water supply to garden hose.
4. Rinse out the sewer hose with fresh water and remove the sewer hose from the dump station.
5. Remove hose from black tank flush inlet connection and store hose.
6. After rinse water has thoroughly drained from the black tank, close the knife valve and replace the termination cap. If you are parked at a site with a semi permanent sewer hookup, keep the black water knife valve closed to allow the waste level to build up. The outlet will probably clog if you leave the knife valve open continually. Run enough water into the tank to cover the bottom. This will aid the break up of solid wastes.

## Plumbing System cont.

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7. Replace sewer or dump station covers.

### Holding Tank Care

Since holding tanks don't rely on any sophisticated mechanical devices for their operation, they are virtually trouble-free. The most common problem is also an unpleasant one - clogging. You can minimize the chances of clogging by keeping the following considerations in mind.

1. Keep the black water tank knife valve closed. Fill tank to at least 3/4-full before draining. Be sure to cover the tank bottom with water after draining.
2. Use only toilet tissue formulated for use in septic tank or RV sanitation systems.

<b>▲ Caution</b>
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**Do not use the same hose you use for filling the potable water tank, or for connection to the city water inlet. This is especially true if you connect the quick connect hose to the typical rinsing hoses at most dumping stations. Use of a different hose will insure that you will not contaminate your fresh water supply.**

**The sewer drain valve must be open when using the black tank flush inlet.**

1. Keep both knife valves closed and locked, and drain cap tightly in place when using the system on the road.
2. Use only cleaners that are approved for use in septic tank or RV sanitation systems.
3. Use a special holding tank deodorant chemical approved for septic tank systems in the black water holding tank. These chemicals aid the breakdown of solid wastes and make the system much more pleasant to use. Do not put facial tissue, paper, ethylene glycol-based or automotive antifreeze, feminine hygiene products or household toilet cleaners in the holding tanks.
4. Do not put anything solid in either tank that could scratch or puncture the tank.

**If the drain does get clogged:**

1. Use a hand-operated probe to loosen stubborn accumulations.
2. Seriously, clogged P-traps may require dis-assembly. Be careful not to over tighten when reassembling.
3. Do not use harsh household drain cleaners.
4. No not use motorized drain augers,

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## Chapter 7 Electrical Systems

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The electrical systems in your trailer are designed and installed in accordance with all codes, regulations, and standards in effect at the time the trailer was built.

There are three basic systems in your trailer. The 120-volt AC system is similar to that in your house: it is supplied by an external service connection, or by a generator set. The exterior lighting and braking systems use 12-volt DC power supplied by the tow vehicle. The interior lighting, fans, and some appliances use 12-volt DC power supplied either by the trailer battery, the tow vehicle, or by the AC/DC power converter.

### 120-Volt AV Electrical System

This system provides grounded (three wire) electrical services for appliances such as air conditioners, microwave oven, etc. The 120-volt system also provides power for the AC/DC power converter. Your trailer is equipped with a heavy duty power cord to connect to an external 120-volt, 30 amp rated AC service. The cord and plug are molded together to form a weather-proof assembly. Do not cut or alter the cord in any way. Do not remove the ground pin from the attachment plug, or defeat the ground circuit in the trailer. If you have to use an adapter to plug into an electrical service, make sure the ground is maintained. Never use a two-conductor extension cord, or any cord that does not assure appropriate and adequate ground continuity. Never plug the 120-volt cord into an ungrounded receptacle.

<b>▲ Warning</b>
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**Do not operate the 120-volt AC electrical system without a proper ground. Electrocutation or severe electrical shock could result.**

### Power Cord Hook-Up

Your trailer is equipped with one heavy duty 30-amp power cord. It is commonly called the "shore cord." This cord is used to connect to external 120-volt AC service. The cord will supply power to all 120-volt appliances and outlets. The cord and connector is molded together to form a weatherproof cable assembly. Do not cut or alter the cable in any way. Do not remove the ground pin in the cable connector, or defeat the ground circuit in the trailer.

To connect the power cord to external service push the plug straight into the receptacle until it seats completely.

### Ground Fault Circuit Interrupter (GFCI)

Galley, bathroom and patio 120-volt electrical outlets are protected by a **Ground Fault Circuit Interrupter (GFCI)**. This device is designed to disconnect the outlet (and other outlets on the same circuit), limiting your exposure time to the shock hazard caused by current leakage to ground.

The GFCI device does not prevent electric shock, nor does it protect a person who comes into contact with both "hot" and neutral sides of the circuit. It does not protect against electrical overloads.

## Electrical Systems -continued

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**Test the GFCI at least once a month while operating on 120-volts AC. To test the GFCI:**

1. Push the TEST button. The RESET button should pop out, indicating that the protected circuit has been disconnected.
2. If the reset button does not pop out when the test button is pushed, a loss of ground fault protection is indicated. Do not use the outlet or other outlets on the same circuit. Have the trailer electrical system checked at an authorized Outdoors RV dealer or by a qualified electrician. Do not use the system until the problem has been corrected.
3. To restore power, push the RESET button.

Your **Owner's Information Package** contains a card that can be used to record test dates. Keep the card in a conspicuous place, and keep it up to date.

### Note

**The galley or patio outlets don't work, check the bathroom GFCI. Reset it if necessary. If the GFCI continues to trip, have the trailer electrical system checked at an authorized Outdoors RV dealer or by a qualified electrician.**

### ▲ Warning

**Do not install 12-volt fuses or 120-volt breakers with amperage ratings greater than that specified on the device or label. Doing so constitutes a fire hazard.**

## The Power Distribution Center

One side of the power center consists of a breaker box containing the 30-amp main breaker and the 15- and/or 20-amp branch circuit breakers. These devices interrupt the power if the rated current is exceeded. Never substitute a breaker with a higher value than originally installed. If a breaker trips repeatedly, reduce load on that circuit and have the system checked by a qualified electrician.

## The Power Converter

The power converter will supply 12-volt DC power when the trailer is operating on 120-volts AC. When you are connected to 120-volt AC power, the power converter works with the trailer battery to provide power for the interior 12-volt system and to keep the battery charged. While a battery is not necessary for converter operation, when 12-volt power demand is high some converters will produce more stable voltage levels if a battery is installed. At these high power draws, the battery supplies some of the power demanded; and it will not charge as quickly or completely under this condition.

### ▲ Note

**The 12-volt battery is not supplied with the trailer by Outdoors RV. Check any installed battery manufacturer specifications and requirements for use.**

The converter will supply a small current to the battery even when it is fully charged. To prevent excess electrolyte loss, check the levels every 30 days when the converter is connected to 120-volt AC power. Always refill with distilled water. See **Battery Inspection and Care** in this section.

## Electrical System -continued

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### 12-Volt DC System - Exterior

This is the vehicle electrical system. It includes the electric trailer brake system, taillights, turn signals, clearance lights, and backup lights ( if equipped ). It is powered by the tow vehicle through the car connector cord.

#### Exterior Bulbs and Fuses

Replace bulbs and fuses with the same type or equivalent. Fuses for these exterior lights are located on the tow vehicle fuse panel. The brake system should never be fused.

### 12-Volt DC System - Interior

All 12-volt DC lights (other than those listed above), fans, pump, and motors are included in this system. The fresh water pump, furnace, and any 12-volt entertainment equipment are also included. Power may be supplied by the AC/DC power converter, or by the trailer battery if installed.

The power center contains most of the fuses for the 12-volt system. Some fuses for items such as power jacks may be located at the trailer battery. These fuses are automotive type and should be replaced with the same type and amperage rating. Blade-type fuses located in battery compartments must be sealed type (ATC). Some fuse types have exposed fuse links and should not be near flammable materials.

#### **▲ Warning**

**Do not install fuses with amperage ratings greater than specified on the fuse box or fuse holder label.**

Circuits which are powered by the battery (except trailer brakes) are protected by one or more 12-volt circuit breakers. If one of these breakers trips, reset by disconnecting the battery. Find the cause of the breaker tripping before reconnecting the battery.

Battery charge can be checked on the Monitor Panel. To check battery charge:

1. **Unplug** the 120-volt AC power cord to turn the power converter off.
2. **Turn on** light to load the battery slightly.
3. **Press** appropriate switch to activate monitor panel.
4. **Read** battery condition on the display.

### Battery Selection

When the trailer battery requires replacement, always choose a battery with the same physical and electrical characteristics as the original equipment. We recommend an RV / marine deep cycle battery. Your dealer or any other or authorized Outdoors RV dealer can advise you on proper battery selection.

#### **▲ Note**

**The 12-volt battery is not supplied with the trailer by Outdoors RV Manufacturing. Check any installed battery manufacture specifications and requirements for use.**



Check the external condition of the battery monthly. Look for cracks in the cover and case. Check the vent plugs. Replace them if they are cracked or broken. Keep the battery and terminals clean. Accumulations of acid film and dirt may permit current to flow between the terminals and discharge the battery. To clean the battery, wash it with a diluted solution of baking soda and water to neutralize any acid present, then flush with clean water. Foaming around terminals or on top of the battery is normal acid neutralization. **Avoid getting the soda solution in the battery.** Be sure the vent caps are tight. Dry the cables and terminals before reinstalling them, and don't use grease on the bare metal inside the cable terminals to prevent corrosion. Grease is an insulator. Electricity will not flow through it. A plastic ignition spray will protect the terminals after you have cleaned and reinstalled them.

To prevent the battery from shaking in its carrier, it is recommended to use a hold-down strap that is securely installed. Check it often. Keep the battery storage box clean and free of corrosion and chemical accumulation.

### **▲ Warning**

**Disconnect the 120-volt electrical cord and both cables from the trailer battery before working on either electrical system.**

**Remove rings, metal watchbands, and other metal jewelry before working around battery. Use caution when using metal tools. If tools contact the battery terminals or metal connected to them, a short circuit could occur which could cause personal injury or fire.**

**Do not allow battery electrolyte to contact skin, eyes, fabrics, or painted surfaces. The electrolyte is a sulfuric acid solution which could cause serious personal injury or property damage. Wear eye protection when working with batteries.**

## **Battery Charging**

Normally the battery will be kept charged by either the tow vehicle charging system while on the road, by the power converter when plugged into AC service. On those occasions when the battery needs to be charged from a different source, please follow these safety guidelines:

1. Do not smoke near batteries being charged or which have been recently charged. Please note that batteries are being charged while you drive, while you are connected to 120- volt AC power by the converter.
2. Do not break live circuits at the terminals of the battery. Use care when connecting or discharging booster leads or cables on fast chargers. Poor connections are a common cause of electrical arcs which can cause explosions. Ensure polarity is correct. Never reverse polarity or damage will result.
3. Check and adjust the electrolyte level before charging. Fill each cell to the indicator with distilled water.
4. Do not charge the battery at a rate that causes the electrolyte to spew out the top of the battery. Electrolyte is corrosive, always clean up any spills.
5. Always remove the vent caps before charging the battery.

**▲ Warning**

Never expose the battery to open flame or electric spark. Chemical action in the battery generates hydrogen gas which is flammable and explosive.

**Storage Precautions**

When you store your trailer for a week or more, be sure to disconnect the battery. Electronics, tuning radios, clocks, and the Propane leak detector all draw a small amount of current whenever the battery is connected, also, even a disconnected battery will naturally "self discharge" about 1% percent of capacity per day. If you intend to store your trailer for any length of time, remove the battery, store it in a cool, dry place, and recharge every month.

**Typical Bulbs And Fuses**

The following is a list of typical 12-volt bulbs and fuses used in your trailer. It is recommended to keep a screwdriver, fuse puller, and a couple of spare of each type on hand.

**Bulbs**

- Interior lights: # 1141
- Stop/tail lights: Bargman # 40-06-001
- Porch light: # 1003 or 93
- License plate light # 67
- Clearance lights: # 194
- Backup lights:  
(if equipped): Bargman # 40-06-003
- Exterior floodlight  
(if equipped): Wagner # 7614H

**Fuses**

- Blade type  
(Buss® ATC) 7.5, 10, 15, 20, & 30-amp
- Glass type: (AGC): 7.5, 20, & 30-amp

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## Chapter 8 Propane System

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Propane is available from an approved storage container to operate your range, oven, furnace and water heater and as an alternate energy source for some refrigerators. With proper handling precautions, Propane is safe and provides modern convenience wherever you travel. Propane is stored as a liquid under pressure and vaporizes under the control of pressure regulators.

### Propane Safety Precautions

With proper usage Propane is considered a safe and reliable fuel. As with any other volatile and flammable material, common sense dictates that Propane be handled and used with respect and caution. Because propane systems are so reliable, they are often taken for granted. Neglect can be a very dangerous habit. If the system is maintained regularly, you can expect almost trouble free operation. (Refer to the Maintenance Guideline of this manual.)

The first time you have your Propane cylinder filled, have the serviceman bleed a little Propane out of the small outage valve (this also lets you check that the bottle is not overfilled) and note the odor described as garlic/rotten egg like for future reference. A small number of people cannot smell this odor; if you are one of these you must take extra care whenever you use your trailer. Keep the cylinder valve closed and turned off all appliances if the trailer is not being used.

<b>▲ Warning</b>
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**Propane is flammable and potentially explosive. Use proper handling, lighting and ventilating procedures.**

- 1. The distinctive odor of Propane indicates a leak. If you smell Propane or the Propane leak detector alarm sounds:**

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

**Do not touch electrical switches.**

**Shut off the propane supply at the container valve (s) or Propane supply connection(s).**

**Open doors and other ventilation openings.**

**Leave the area until odor clears.**

**Have the Propane system serviced by a professional before using the trailer again.**

### **Failure to comply could result in explosion resulting in death or serious injury**

- 2. Never check for leaks with an open flame. Use an approved leak detection solution or a non-ammoniated, non-chlorinated soap solution only.**
- 3. Always be careful when drilling holes or fastening objects to the trailer. The Propane supply lines could puncture by a nail or screw.**
- 4. Do not restrict access to Propane containers. In an emergency, the container service valve must be easily identified and accessible. The container compartment door must always be unlocked, and the Propane label should be visible.**
- 5. Do not carry or store filled or empty Propane containers, including accessories such as Propane barbecues, in your trailer. Propane containers are equipped with a safety device that relieves excess pressure by discharging Propane into the atmosphere. always store Propane containers outside with the valves closed and plugged/capped.**
- 6. Do not use any Propane container other than the one furnished with your trailer without being sure that all connecting components are compatible.**

**▲ Warning**

7. Turn off Propane main valve before filling Propane container or entering a Propane bulk plant or motor fuel station. Turn off all pilot lights and appliances individually before refueling of motor fuel tanks and/or Propane containers. When not individually turned off, automatic ignition appliances may continue to spark when Propane is turned off at the container.
8. Do not fill Propane containers to more than 80% capacity. Failure to comply could result in death or serious injury. Overfilling can result in uncontrolled Propane flow which can cause fire and explosion. A properly filled container holds about 80% of its volume as liquid.
9. A warning label has been located near the Propane container. This label reads: warning do not fill container(s) to more than 80-percent of capacity. Failure to comply could result in fire or personal injury.
10. Propane regulators must always be installed with the regulator vent facing downward. Regulators that are not in compartments have been equipped with a protective cover. Make sure that the regulator vent faces downward and that the cover is kept in place to minimize vent blockage that could result in excessive Propane pressure causing fire or explosion.
11. Do not use a wrench or pliers to close the cylinder shut-off valve. This valve is designed to be closed by hand. If a tool is required, the valve needs repaired or replacement.
12. Be sure the cylinders are securely fastened in their rack whenever they are mounted on the trailer.
13. If you do not have the special tools and training necessary, do not attempt to repair Propane system components.
15. DO NOT modify or alter the Propane plumbing system.
16. If any appliance or piping has been serviced, ensure that a system leak check has been performed by a trained technician. This should be verified before taking delivery of the trailer.

## **System Components**

### **Hoses and Fittings**

The hoses used in your propane system meet stringent requirements, and are rated to withstand many times the pressures encountered in the system. Check the hoses for weather checking or signs of deterioration every time you have a Propane cylinder filled or serviced. When you replace hoses, be sure that replacements are the same size, properly rated and approved for RV use.

The fitting at the end of the Propane high pressure hose is one with which you will most often come into contact with - you will handle it many times during your trailer ownership to service and fill your Propane cylinders. Turn it to the right to tighten, turn left to loosen. It does not require any type of pipe sealant. If it ever leaks or cannot be reasonably tightened without excess force, replace the complete hose assembly and /or have the cylinder valve checked and serviced.

## Propane System -continued

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This fitting contains an excess flow valve to restrict Propane flow if the flow exceeds the valve design output. Note that it is not designed to detect a leak or to totally shut down the system if a failure occurs.

### Propane Regulator

The two-stage regulator produces approximately 11 inches of water column (less than 0.5 psi) to serve your appliances. Be sure the regulator vent stays clean and free from obstructions.

The regulator is mounted so that the vent is facing downward and is protected by a cover. Be sure the cover is on at all times. If the vent becomes clogged, it can be cleaned with a toothbrush. If corrosion is evident, contact a qualified Propane service technician for assistance.

The regulator incorporates a feature known as "automatic changeover." Propane systems used in trailers are designed to operate from two separate Propane cylinders, and the auto changeover allows continuous Propane supply, when one cylinder runs out.

In a dual cylinder system you start out with two full cylinders of Propane. Position the cylinder selector lever all the way toward the cylinder that you want to use first, this will be your "service" cylinder. The other cylinder will be your "reserve" cylinder. Make sure all appliances and pilot lights are turned off. Open both cylinder valves and wait until the regulator indicator turns green before attempting to light an appliance. A green regulator indicator means that the system is pressurized with Propane.

When the service cylinder runs out of propane the regulator indicator will turn red. This means that you are drawing Propane from the "reserve" cylinder, making it the "service" cylinder.

<b>▲ Warning</b>
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**Your trailer has been equipped with Propane containers that feature an overfill protection (OPD) NFPA 58 (Propane Code) states that these portable cylinders shall not be filled without this device.**

**Do not under any circumstances use an older non-OPD cylinder. Inadvertently overfilling of the pre-OPD cylinders can result in uncontrolled Propane flow that in unvented surroundings can cause fire and/or explosion.**

### Using Propane System At Low Temperature

Your Propane system will function at low temperature, provided the system components are kept at a temperature above the vapor point of the Propane. Ask your Propane supplier or your travel trailer dealer for information on product blends available in your area and the areas in which you will be traveling.

The following chart shows the reduction in available BTU's/hour under various fill levels as the temperature drops:

%Full	20 LB. Cylinder				
	+ 20	0	-5	-10	-15
60%	36,000	18,000	12,750	8,500	4,250
50%	32,400	16,200	12,150	8,100	4,050
40%	28,800	14,400	11,400	7,600	3,800
30%	25,200	12,600	10,450	5,400	2,700
20%	21,600	10,800	8,100	5,400	2,700
10%	16,200	8,100	6,075	4,050	2,025

\* 30 lb. Cylinder multiply X 1.40

## Propane System -continued

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The chart clearly shows how the availability of the Propane is reduced at lower temperatures. With this in mind, keep your Propane cylinder as full as possible during cold weather. Check the BTU/hr rating plates on your Propane appliances. This information will help you manage your Propane usage.

### Propane System Check

Do a visual check of all exposed piping and fittings after you have arrived at a destination and before you use the Propane system.

Keep the cylinder valve closed and turned off all appliances if the unit is not being used.

Always have the system checked by a professional any time you detect a garlic/rotten egg like odor or hear a sustained hiss when you turn the Propane on.

The indicator will turn green and is now safe to disconnect the empty cylinder. The rule of thumb is "do not disconnect the empty cylinder if the indicator is red."

After filling the empty cylinder, hook it back up and open the cylinder valve.

#### **▲ Warning**

**When removing an empty cylinder position the regulator selector lever to the full cylinder. Failure to do so will result in Propane escaping out of the high pressure hose through the excess flow check valve.**

**Do not attempt to adjust the regulator. It has been preset by the regulator manufacturer. If any adjustment is required, it must be made by a qualified Propane service technician using special equipment.**

### Filling Propane Cylinders

To fill storage cylinders, the cylinders must be removed from the trailer and taken to a Propane supplier or one of the service stations which sell Propane. Do not attempt to fill the Propane tank yourself.

#### **▲ Warning**

**Do not fill Propane containers to more than 80% capacity. Failure to comply could result in death or serious injury. Over filling can result in uncontrolled Propane flow which can cause fire and explosion. A properly filled container holds about 80% of its volume as liquid.**

1. Remove the Propane cylinder cover (if equipped). Close the supply valve on the empty cylinder.
2. Switch cylinder selector lever to the full cylinder.
3. Disconnect the quick connect hose fitting at the valve. Turn it to the left to loosen.
4. Be sure the plastic cap is cleaned and install it over the cylinder valve outlet. This will help protect the valve fitting threads and will prevent contamination or debris from entering the valve during transportation to a Propane service facility.

## Propane System -continued

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5. Loosen the wing nut on the threaded rod. It should be loosened just enough to allow the hold down bracket to clear the empty cylinder.
6. Remove the empty cylinder. **(Do Not Move The Trailer With The Empty Tank Removed And The Hold Down Bracket Loose)** and have it filled.
7. Reverse the procedure to replace cylinder.

### **▲ Warning**

**Never check for leaks with an open flame. Do not check copper and brass plumbing lines and fittings for leaks using ammoniated or chlorinated household type detergents. These can cause cracks to form on the line and brass fittings. If the leak cannot be located, take the trailer to a Propane service representative.**

## Propane Leak Detector/Alarm

A permanently installed Propane leak detector/alarm is located near the floor. The unit contains an alarm that will sound alerting you to the presence of low levels of potentially dangerous Propane that may have accumulated.

The detector/alarm unit is powered by 12-volt DC system in your trailer. A green light on the detector/alarm front panel indicates that the detector/alarm has power.

Test the leak detector/alarm each time the trailer is relocated and set up for use. Detailed information for the leak detector/alarm can be found in the **Owner's Information Packet**.

### Test Procedure:

1. Hold a butane-fueled pocket lighter near the sensor.
2. Open the lighter valve without striking a flame for 3 seconds.
3. The leak detector/alarm should respond within seconds.
4. Press the mute button to reset the alarm.
5. Lightly fan the area around the detector/alarm to insure complete dispersion of the Propane from the lighter, and to prevent another sounding of the alarm.
6. A mute button allows you to temporarily quiet the alarm for 60 seconds after it has been set off or after testing.
7. If the alarm does not sound during a test or if the green indicator light is not visible, see your dealer or any authorized Outdoors RV dealer. There are no batteries or user serviceable parts inside the unit.

### **▲ Note**

**The detector/alarm draws enough current to discharge your battery.** Remember to disconnect your batteries or recharge your batteries on a routine bases.

## Lighting Propane Appliances

Detailed operating information for Propane appliances can be found in your **Owner's Information Package**. Please read and follow these instructions.

## Propane System cont.

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Air trapped in the Propane lines may delay the initial lighting of any appliance. It could take several seconds or minutes for the Propane to reach the appliance. To purge some air from the Propane system, first light a burner on the range. The other appliances will then light more quickly.

The first time the furnace or oven is operated, paints and oils used in manufacture may generate some smoke and fumes. If this occurs, open doors and windows to air out the trailer. These materials should burn off after the first 15 to 20 minutes of appliance operation.

**Always follow the appliance manufacturer's lighting, operating and maintenance instructions.**

<b>▲ Warning</b>
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**The Propane detector/alarm is powered by a 12-volt source. Any interruption in power will render this alarm inoperative. Always ensure power is supplied especially when appliances are in use.**

### Propane Safety Tips

Rules to remember:

1. Keep Propane cylinder/tanks away from heat sources.
2. Always store and transport unused cylinders with the service valve closed and plugged/capped.
3. Never store, transport or repair Propane cylinders in enclosed areas. In addition to living area, this also includes enclosed garages, storage sheds, passenger vehicles and tents.
4. Regularly inspect "high pressure hose assembly" and other flexible hoses for signs of cracks or abrasion. Replace them before they become old enough to develop leaks.
5. Never use a cylinder if it shows signs of dents, gouges, bulges, fire damage, corrosion, leakage, excessive rust or other forms of external damage.



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## Chapter 4: Appliances and Equipment

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### What to do if you smell gas

1. Do not try to light appliances.
2. Extinguish any open flames including cigarettes.
3. DO NOT TOUCH ANY ELECTRIC SWITCH.
4. Open windows and doors.
5. Exit trailer.
6. Shut off the gas supply at gas LP Bottle (source).
7. Immediately call a service center or gas supplier from outside phone and follow their instructions.
8. Do not turn on the gas supply until the gas leaks have been repaired.

**Refer to the individual manufacturer's Owner's Manual for operating instructions on the following equipment.**

### Air Conditioner (Optional)

Roof mounted air conditioners are operated by an 110V AC power source through a separate circuit breaker. Keep in mind that typically RV electric systems are designed to handle 30 amps and that the air conditioner takes a sizable portion of that when the compressor starts. Reduce other loads as much as possible when using air conditioning to reduce the chance of overload and possibly tripping the main breaker. (For thermostat operation on the air conditioner, see "thermostat" in this section.)

### Capability vs. Environment

The capability of the air conditioner to maintain the desired inside temperature is directly effected by the heat gain of the trailer. During extreme high outdoor temperature, the heat gain of the trailer may be reduced by:

1. Parking in a shaded area.
2. Keeping blinds down or drapes shut.
3. Keeping windows and doors shut and minimize usage.
4. Operate on High Fan/Cooling mode will provide the maximum efficiency in high humidity or high temperatures.
5. Using awnings to block direct sunlight exposure on the trailer.
6. Avoid use of heat producing appliances.
7. Giving the A/C a "head start" by turning the air conditioner on early in the morning.

### Care and Maintenance

Periodically remove the return air filter and wash with hot soapy water. During extended use situations, cleaning is recommended after two weeks of daily usage.

### **▲ Warning**

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

**▲ Warning**

When refueling tow vehicle, shut off all LP gas appliances. Most LP gas appliances are vented to the outside. Gasoline fumes could enter the appliances and ignite from the burner flame, causing an explosion or fire.

Lp Gas containers shall not be placed or stored inside the trailer. LP Gas containers are equipped with safety devices that relieve excess pressure by discharging gas to the atmosphere.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of any appliances.

Never run the A/C without the filter. This could plug the unit evaporator cell, substantially effecting performance.

### TV Antenna

The television antenna installed is designed for either color or black-and-white television. If reception is poor, make sure the power supply switch is on and connections are tight. Should the reception remain poor, check with your authorized dealer.

#### To Raise Antenna

1. Check location to ensure no obstacles will be encountered while raising the antenna.
2. Turn elevating crank (clockwise) in an "UP" direction until resistance is felt
3. Turn Power Supply switch "ON" (If cable is being used the power supply switch needs to be to "OFF".)

#### Rotate for Best Picture

1. Make sure antenna is fully raised.
2. Pull down on lower ceiling plate with both hands until it disengages and will turn.
3. Slowly rotate clockwise or counter clockwise for best picture and sound.

#### To Lower Antenna

1. Rotate antenna until pointer on directional handle aligns with pointer on ceiling plate.
2. Turn elevating crank ( counterclockwise ) in "Down" direction until resistance is felt. Antenna is now locked in travel position.

**▼ Warning**

Do not raise antenna near overhead electrical wires as contact may cause injury or death.

### Awning, Patio (Optional)

An operating and maintenance guide for your awning is included in your Owner's Information Packet. It contains complete instructions for opening and closing the awning, as well as maintenance and care instructions.



**Caution**

If heavy rain is predicted, or whenever you leave the awning unattended, it is best to close the awning. Damage to the awning or unit due to weather is not covered under the Outdoors RV Manufacturing Limited Warranty or the awning manufacturer warranty.

**▼ Warning**

Do not attempt any repairs to the awning. The awning roller tube is under extreme spring tension. Repairs should only be performed by an authorized dealer / repair center.

### Cable Hook-Up

To utilize the cable access, locate the exterior hookup on the side of the trailer. Attach cable to access hook-up and trailer hook-up. Finally, make sure the antenna power booster is set on "cable" and not "antenna".

### Converter: See Electrical Section

### Fan-Tastic Vent (Optional)

The FanTastic Vent runs on 12V. Dependent upon the model, operational control may be by a thermostat like control switch or by controls directly mounted to the vent. See information included in the unit packet for operating instructions concerning the installed model. When using the FanTastic Vent, close all vents and slightly open the windows on the shaded side of the trailer. The direction of the air flow is determined by which window(s) are opened. Please note that the dome of the event must be opened at least three inches for the motor to operate. A safety switch will prevent operation if the dome is closed or open less than three inches.

### Furnace

The furnace installed is a LP gas appliance. Carefully read the manufacturer's manual for complete operational and safety instructions, provided in the unit packet, prior to using the furnace.

**▲ Warning**

**Failure to read the furnace user's information manual and follow instructions could cause a fire or explosion, causing property damage, serious injuries or loss of life.**

The furnace utilizes a sealed combustion system, which means the combustion chamber is completely sealed from the inner atmosphere of your trailer. Combustion air is drawn from the outside and combustion products are expelled outside through a vent.

New furnaces sometimes emit smoke and an odor during the first 5 - 10 minutes of initial use due to paint burning off the heating chamber. Do not mistake this for a malfunctioning furnace. Opening the windows and doors prior to first lighting will help vent any smoke or odor.

### Thermostat

Outdoors RV travel trailers and 5th wheel trailers have either a heat only thermostat or a combination air conditioner / furnace thermostat if an air conditioner is equipped at the factory. Please refer to the user's manual for specific thermostat installed.

### Operation - Heat Only Thermostat

To turn "ON" Set temperature to desired level. To turn "OFF" set thermostat to lowest setting and follow instructions for furnace operation in the manufacturer's user's guide.

### Heat Operation - A/C and Heat Thermostat

Set the temperature select level to the desired temperature level. Set the system switch to "Furnace".

### Cooling Operation

1. Set the temperature select lever to the desired temperature level.
2. Select the FAN speed
3. "HI" Maximum cooling
4. "LO" Maintaining temperature level / night use.
5. Select FAN AUTO / ON switch.
6. "AUTO: Runs whenever cooling required and stops when not required.
7. "ON" Air conditioner fan runs continuously to circulate air.
8. Set system switch to "COOL" position.
9. When the SYSTEM switch is in the "OFF" or "FURNACE" and the AUTO/ON "Switch is in the "ON" position; the A/C fan will run continuously at the selected fan speed. This circulates air inside the trailer.

### Microwave / Convection Oven (Optional)

Installed microwaves operate on 120V AC power only. Please read the Owner's Guide in the unit packet for use on special features and operation.

### Care and Maintenance

To clean exterior surface and the oven interior, use only mild, non-abrasive soaps or detergents applied with a soft sponge or cloth. Never operate the microwave when oven is empty.

### Monitor Panel: See Plumbing Section

### Range Hood

The range hood operates on 12V power and should be used as a ventilating system when cooking. Operational switches for the fan and / or light are on the front panel of the range hood.

### Care and Maintenance

Care of the range hood is similar to the range. Use warm soapy water and wipe off any grease before staining can occur. Do not use harsh chemical cleaners or abrasives. Clean the plastic light lens and filter by removing and washing in hot soapy water. Frequency of cleaning is dependent upon range use.

## **Range / Cook-Top**

The range or cook-top installed is a LP gas appliance. Carefully read the manufacturer's manual for complete operational and safety instructions, provided in the unit packet, prior to using the appliance.

### **Operation**

#### **Prior to Lighting**

Assure the gas supply to the trailer is turned "on". Open a window and / or vent for ventilation purposes. Check for any hazards (flammable liquids, fabrics, objects near burners). If gas smell is present, Do Not light. See "What to do if you smell gas". Depress knob corresponding to burner to be lit and turn to "Light" position.

#### **Immediately Light Burner**

Match-Light Models: Hold a long match or hand held igniter, near the burner port. Make sure the hand held igniter is the type designed for open flame burners.

Piezo Ignition Models: Rotate the Piezo knob clockwise rapidly. This will produce a spark to ignite the gas.

After lighting adjust burner flame to needed level. If flame on burner goes out after initial lighting or cooking, turn burner knob to off and wait 5 minutes before attempting to relight. Before attempting to relight, check to make sure gas smell has disappeared. If odor still present after 5 minutes "DO Not" relight burners. See "What to do if you smell gas".

To turn burner(s) off: turn the knob to the "OFF" position.

The Range or Cook-top installed is a LP gas appliance. Carefully read the manufacturer's manual for complete operational and safety instructions, provided in the unit packet, prior to using the appliance.

### **Oven Operation (if equipped)**

Oven pilot must be lit prior to operating.

#### **Lighting Oven Pilot**

Be sure all valves and oven control knob are in the "OFF" position. Assure the main gas supply is on. Open oven door and smell for gas. If odor present - Stop and:

1. Do not try to light any appliance.
2. Extinguish any open flames including cigarettes.
3. DO NOT TOUCH ANY ELECTRIC SWITCH.
4. Open windows and doors.
5. Exit trailer.
6. Shut off the gas supply at the gas bottle or source.
7. Immediately call a service center or gas supplier from an outside phone and follow their instructions.
8. Do not turn on the gas supply until the gas leaks have been repaired.

If no gas smell present, light a match, depress and turn oven control knob to "Pilot Zone" and light pilot.

## Appliances and Equipment - continued

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### Operation of Oven Burner

Depress oven knob and turn to desired setting. (A delay of approx. 45 seconds will occur before burner is lit - This is normal)

### To Shut Down Oven Burner

Turn oven control knob to "Pilot On" position - This will keep the oven pilot lit.

### To Shut Down Oven Pilot

Turn oven control knob to "OFF" position.

### Care and Maintenance

Before cleaning make sure all knobs are in the "OFF" position and wait until all surfaces, including burners, are cool. Use warm soapy water only. Do not use oven cleaners, bleach or rust removers on the range/cook top surface. Wipe up any spills as soon as possible to avoid possible discoloration or pitting on the surface. Check burner ports when cleaning. If ports or the orifice is clogged, carefully clean with a toothpick.

## Refrigerator

The refrigerator installed is a LP gas appliance. Carefully read the manufacturer's manual for complete operational and safety instructions, provided in the unit packet, prior to using the appliance.

### Operation

The refrigerator operates on either 120V AC or LP Gas and has a gravity-based cooling system.

The cooling coils are sloped to allow continuous movement of the liquid chemicals and if the unit is not level for extended periods, the flow of these chemicals will slow and pool inside the tubing, resulting in a loss of cooling.

During towing, the leveling is not as crucial as the movement of the trailer will prevent the liquid inside the tubing from pooling. If needed to park for several hours, the trailer should be leveled if operating the refrigerator or the refrigerator needs to be turned off.

### **▲ Danger**

**LP-powered appliances produce carbon monoxide. Carbon monoxide can be fatal! When the device detects carbon monoxide in the air it will sound. Consult the individual detector's user manual for specific instructions and / or audible warning meanings.**

Placing a small bubble level inside of refrigerator will assist in determining if level for operational efficiency.

When starting the refrigerator for the first time or after extended storage, allow up to four hours for the cooling cycle to become fully operational.

### Operational Controls

1. Auto Mode: The control system on the refrigerator will automatically select between gas and AC electric operation. AC will always be selected if available. If AC becomes unavailable, the refrigerator will switch to gas mode operation. When in auto mode the indicator lamp on the control panel will be lit.

## Appliances and Equipment -continued

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2. Gas Mode: This mode when selected provides gas operation only. The indicator lamp for auto will not be lit.

### Care and Maintenance

1. Exterior: ventilation of the refrigerator is essential. Make sure the vents are clear of any obstructions such as bird/insects nests, spider webs, or any other debris. Periodically clean the coils on the back of the refrigerator with a soft bristled brush. At no time should any combustible materials, such as gasoline, flammable liquids, or vapor be stored near the refrigerator.
2. Interior: When cleaning the interior lining of the refrigerator, use a weak solution of soda and warm water. Use only warm water, however, when cleaning the finned evaporator, ice trays and shelves. Never use harsh chemicals or abrasive cleaners to clean these parts or their protective coatings will be damaged.
3. Defrosting: When defrosting the refrigerator, shut off the power by turning the main power button to the off position. Remove any food and leave the drip tray under the finned evaporator. Remove light bulb or cover switch with a piece of tape. Leave the door's open and empty drip pan when necessary. Dry with soft cloth when done.

### Any Service To The Refrigerator, Must Be Performed By A Qualified Repair Technician

### Roof Vents

Manual and / or power vents are installed on Outdoors RV travel trailers and 5th wheel trailers. For Fan-Tastic vent, see information on the specific product in this section. Operate the roof vents when showering, bathing ,washing dishes, or anytime hot water is used, as it allows moisture to escape. Ventilation is extremely important in reducing condensation formation.

### Safety

Fire safety is important whether at home or in a recreational vehicle. The best way to limit fire risk is by prevention. Follow the manufacturers' instructions on the use of all appliances and observe all safety warnings and instructions included.

Before camping, make certain the locations of all safety equipment inside the trailer and all emergency exit windows as well as doors. An escape plan for emergencies whether at home or camping is always a good idea.

### Egress Windows

Egress or "Emergency Exit" Window are labeled from the factory with the word EXIT. All Egress windows can be distinguished by red operational handles or levers. Dependent upon the window type, an egress window may be a large section or an entire window. Review the location and operational instructions posted upon the window with all passengers.

### Fire Extinguisher

Included in each trailer and or 5th wheel trailer is a fire extinguisher, which is located near the main entry door. The fire extinguisher is rated Class B (gasoline, grease, and flammable liquids) and Class C (electrical) fires. Test and operate according to manufacturer instructions.

### LP Detector

See LP section of this manual.

## **Smoke Detector**

For safety a smoke detector is installed in the living/cooking area. Smoke detectors should be tested prior and during each camping trip, or weekly during the season. Most detectors are powered by a 9-volt battery. Keeping fresh extra batteries on hand is a good idea.

## **Carbon Monoxide Detector**

A carbon monoxide (CO) detector is installed in your trailer. For specific information regarding the specific operation or function of the particular detector in your trailer, consult the individual manufacturer's owner's manual.

Common sources of CO are malfunctioning or misuse of gas appliances, vehicle engines, generators and many other fuel burning products.

Indications of CO poisoning are (but not limited to);

### **Mild Exposure**

1. Symptoms of the flu (minus a fever)
2. Slight Headache
3. Dizziness
4. Fatigue

### **Medium exposure**

1. Severe Throbbing Headache
2. Drowsiness
3. Confusion
4. Fast Heart Rate

### **Extreme Exposure**

1. Unconsciousness
2. Convulsions
3. Cardio Respiratory Failure
4. Death

For your safety and to keep your carbon monoxide alarm in good working order, follow the steps below.

1. Verify the unit alarm, lights and battery operation by pushing the "Test" button weekly.
2. Vacuum the CO alarm cover with a soft brush attachment once a month to remove accumulated dust.
3. Instruct children never to play with the CO alarm. Warn children of the danger of carbon monoxide poisoning.
4. Never use detergents or solvents to clean the carbon monoxide alarm.
5. Avoid spraying paint, hair spray, air fresheners or other aerosols near the CO detector.
6. Do Not paint the CO detector. Paint will seal the vents and interfere with the sensor ability to detect CO.
7. Do not place near a diaper pail.
8. Test the alarm operation after your trailer has been in storage, before each trip and at least once a week during the camping season.



**▲ Danger**

If the alarm sounds provide ventilation by opening windows and doors. The CO build up may dissipate before help arrives, but may be only temporarily solved. It is crucial that the source of the CO is determined and repaired.

The CO alarm can only warn you in the presence of CO. It does not prevent CO from occurring nor can it solve an existing CO problem.

**▲ Danger**

Carbon monoxide can be fatal! When the device detects carbon monoxide in the air it will sound. Consult the individual detector's user manual for specific instructions and / or audible warning meanings.

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## Chapter 9 Maintenance

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Your trailer has been designed to provide you with many years of use with a minimum amount of maintenance. This section will familiarize you with the areas of your trailer that require scheduled care. Time spent taking care of your trailer on a regular basis will pay for itself in extended service and will help protect your investment.

This section is intended to provide the owner and operator with a general overview of service and maintenance information for the trailer. Detailed service and maintenance information may be found in the **Owner's Information Package**.

### Exterior

#### Fiberglass Care (If Applicable)

Some exterior parts of your trailer are made of fiberglass. The finish on these parts is durable, but not indestructible. Any material and finish will deteriorate in time. Exposure to sunlight, moisture and airborne pollutants can cause dulling and fading of the finish. Generally, changes in the finish due to weathering are cosmetic - they are on the surface of the part and do not affect its strength. Weathering can take the form of chalking, fading and yellowing.

The best way to minimize these effects is routine maintenance. If the finish is not washed and waxed thoroughly, the surface can deteriorate rapidly. The following maintenance guidelines can help you minimize these weathering effects:

1. When the trailer is not in use, keep fiberglass surfaces out of the sun or covered with a canvas tarpaulin. Avoid using plastic or other nonporous materials which can trap moisture between the cover and the fiberglass surface.
2. Wash the exterior with a mild soap. Avoid strong alkaline cleaners and abrasives. For the best results, use a cleaner formulated for fiberglass, and follow the directions for using the cleaner. **Do not use automatic dishwasher detergent, abrasives, bleaches, strong chemicals with acids/ bases, or ammonia.**
3. Wax the exterior at least once a year - twice if possible - with a wax formulated for fiberglass. When waxing, always read and follow the instructions and precautions on the container. Some cleaners and waxes are recommended for use on only certain types of surfaces. As with automobiles, covered storage yields best results for longevity of exterior appearance and ease of maintenance.
4. In some cases, a light rubbing compound, finishing material or other product advertised to restore fiberglass, may be required. Always follow the manufacturer's instructions. Always use high quality wax after restoration.

#### Sheetmetal Care (If Applicable)

##### Sheetmetal Siding Cleaning and Care / Painted Surfaces

Cleaning of fabricated pre-painted coil should be done in shaded conditions or ideally on a mild, cloudy day once to twice a month with a quality car wash or Simple Green solution. Always follow the cleaner manufacturers instructions for care and cleaning.

When cleaning solutions are used for removal of soil, they should be used with brushing or sponging. It may be necessary to sponge the surface while rinsing, particularly if cleaner is permitted to air dry or is wiped dry with a chamois, squeegee or lint-free cloth.

## Maintenance - continued

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Do not allow cleaning solutions to collect on the surfaces of horizontal surfaces or crevices. These areas should be flushed with water and dried. Always clean coated surfaces down from the top to bottom and follow with thorough rinsing with clean water. We recommend waxing the exterior surface at least once a year, preferably twice a year with a quality non-abrasive wax or automotive spray on wax. Exterior Black Streaking can be minimized with more frequent waxing. Note that some waxes are recommended for use on certain types of surfaces. Always read and follow the manufacturers' instruction and precautions on the container.

### Summary of General Cleaning Tips

1. Always clean coated surfaces down from top to bottom. Followed by thorough rinsing. When used in conjunction with a rubber roof. The roof should be washed in accordance with the manufacturers procedure.
2. Strong solvent or strong cleaner concentrations can cause damage to painted surfaces.
3. Abrasive materials such as steel wool, abrasive brushes will harm finishes.
4. Avoid temperature extremes. Heat accelerates chemical reactions and may evaporate water from the solution. Extremely low temperature may give poor cleaning effects. Cleaning under adverse conditions may result in streaking or staining. Ideally, cleaning should be done in shade at moderate temperature.
5. Do not substitute a heavy-duty cleaner for recommended cleaners.
6. Never use paint removers, aggressive alkaline, acid or abrasive cleaners.
7. Follow manufacturers recommendations for mixing and diluting cleaners. Always conduct a surface test to insure cleaning solution will not attack the painted surface.
8. Never mix cleaners.

<b>▲ Note</b>
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**Refer to Exterior Graphics Care for Fiberglass and Sheetmetal application.**

### Stains

Stains are generally caused by two types of substances - water soluble and non-water soluble.

Water soluble stains can usually be washed away with water and mild detergent. Follow the washing with wax.

Non-water soluble stains usually oil-based. Removal of this type of stain may require the use of highly flammable or poisonous solvents. Refer this type of service to your dealer or an authorized Outdoors RV dealer. Never use strong solvents or abrasives to clean plastic surfaces.

### Exterior Graphic Care

The pressure sensitive graphics installed on the exterior surface of your trailer require little maintenance and should be treated similarly to a painted surface. Following are some guidelines to help you keep your exterior graphics looking new.

1. Wash your graphics with any mild car wash soap solution. Be sure to rinse thoroughly.
2. Keep high-pressure wash nozzles at least 1 1/2 feet from the edge of the graphics. High pressure spray may cause the edge of the graphic to lift and peel away from the wall surface. We highly recommend that graphic material be hand washed, as you risk the graphic material lifting and/or peeling when using a high pressure washer. Graphic materials that are damaged from high pressure washing is not considered a **warrantable repair**.
3. Test any cleaning solution on a small section of the graphic before using the cleaning solution on a larger surface.
4. Do not use any aromatic solvents such as acetone, **MEK**, toluene, paint thinner, lacquer thinner on your graphics. Any solvent of this type may soften or smear colors.
5. Do not paint over graphics with clear or any other type of paint.
6. Do not let gasoline or other fuel drip or stay on graphics for any length of time. If a spill occurs, wipe off and rinse with water immediately.
7. Do not apply wax over graphics, especially if the wax contains any petroleum distillates. Wax that has dried between stripes can be removed by softening it with rubbing (isopropyl) alcohol and cotton swabs. Be sure to rinse the area after cleaning.
8. Be careful when storing your trailer. The graphic materials should be protected from prolonged direct sunlight and heat.

## Windows, Doors, Vents and Locks

Keep moving parts, hinges and latches adjusted and maintained. Lubricate with light oil at least once a year.

Check and tighten the screws holding the window in place as required. Clean screens by gently wiping with a damp cloth or soft flat brush. Note all screens are removable.

**Inspect the sealants around doors and windows every three months. See Sealant renewal section.**

Lubricate locksets in doors and exterior storage compartments at least annually with powdered graphite. If the trailer is located at a beach or is exposed to salt air, more frequent lubrication may be required.

## Sealant Renewal

This section outlines the procedures **you must follow** to maintain the weatherproof integrity of your trailer. Leak damage caused by failure to inspect and maintain the roof, vents, TV / satellite antenna and moldings seals may affect your warranty coverage.

The adhesives and sealants used in the construction of your trailer were developed to remain waterproof under sustained effects of weather and vibration. However, even the finest materials will eventually dry out and lose their effectiveness.

## Maintenance - continued

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Your dealer can perform the resealing inspection and work for you. Your dealer also has current information on sealants used in your trailer, and can recommend the appropriate sealants for you if you prefer to do the work yourself. Always use recommended sealants.

### **▲ Note**

**Failure to seal could cause serious damage and may affect your warranty coverage.**

## **Door, Window, Roof Component and Molding Resealing**

Inspect the sealants around windows, floors, joints and doors at least every three months. Also inspect roof vents, and other roof components, molding at front and rear cap, and perimeter molding. If any of the following defects are evident during inspection, the affected areas must be resealed.

1. Sealant cracked or peeling.
2. Void or missing sealant.

### **If you find any of the above defects:**

1. Clean all areas to be resealed with an appropriate cleaner and clean rags.
2. Make sure that all areas to be resealed are absolutely dry before new sealant is applied.

### **▲ Note**

**Do not seal the bottom flanges of windows and doors. Special gaps in the sealant have been intentionally left in the bottom flange to provide drainage.**

## ***INTERIOR***

### **Fabrics**

Interior appointments such as draperies, bedspreads, mattress covers, upholstery and wall pads are manufactured from high quality materials and should be dry cleaned only. Frequent vacuuming will keep them free of dust and dirt. Minor spills should be cleaned up quickly to avoid staining. The affected area should be blotted, not rubbed, to prevent the stain from working deeper into the fabric.

### **▲ Warning**

**Do not use lacquer thinner, nail polish remover, carbon tetrachloride, spot remover, gasoline, or naphtha for any cleaning purpose. These products may cause damage to the material being cleaned, and may be highly flammable or poisonous.**

### **Solid Surface Top Care (If Equipped)**

The counter top is constructed of a solid surface material that requires little care. Routine care involves wiping the surface with a damp cloth to remove water marks. For stains, wipe with soapy water or ammonia-based cleaners. Remove stubborn stains on the "matt/satin" finish with an abrasive cleaner.

## Laminate Top Care (If Equipped)

For cleaning laminate surfaces, use mild dishwasher liquid with warm water. Use soft cloth for both washing and drying.

Do not use abrasive cleaners, steel wool, or gritty cleaners or damage will occur on the surface.

## Walls and Ceiling Panels

The paneling and ceiling of your trailer may be any of several finishes and textures. Never use harsh detergents or abrasive cleaners on walls or ceilings. Most surfaces will clean with a soft cloth moistened with mild liquid detergent in warm water, or a clear window cleaner solution. Do not scrub the surface or use large amounts of water which could saturate the material. Simply spray or apply the solution to the spot and blot with a clean dry rag or paper towel. Aggressive scrubbing may damage the texture or pattern.

## Attaching Accessories to Your Trailer

The sidewalls of your trailer may be built with dense fiber and polymer panel or rigid wood panel used as a substrate to the exterior fiberglass or interior finish surface.

If you want to attach items to the interior walls, **YOU MUST USE RIVETS**. The rivets can be installed with a hand-operated riveting tool such as the arrow E-Z Pull ® Model RH200. This and similar tools are available in most hardware stores and home improvement centers. When you install a component, carefully mark the hole location and drill a 3/16" hole where the rivet is to be located.

If you need rivets, contact your Outdoors RV dealer.

<b>▲ Caution</b>
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**Do not use any type of screw to attach items to the interior or exterior walls of your trailer. If you want to attach items to the walls, you must use expanding head type rivets. Rivet quality, length, and grip range, will vary depending on item to be attached.**

## Plastic/Fiberglass Shower Stall

Some cleaners attack the plastic causing it to discolor and become brittle. The following cleaners have been tested and approved when mixing water:

1. Distilled vinegar.
2. Mild dishwasher detergent.
3. Liquid deodorizing cleaner.

## Floor and Carpeting

Vinyl flooring requires only washing and periodic waxing. Vacuum carpeting regularly, and clean it with a quality carpet cleaner.

## **WHEELS AND TIRES**

### **Tire Inspection**

To obtain maximum tire life, inspect tires for wear and damage before the start of each trip. When the average tread depth reaches only 1/16" at two adjacent tread ribs, replace the tire. Look for abnormal wear patterns such as cupping, feathering, or rapid wear of either the inside or outside of the tread. These conditions may indicate an inflation or alignment problem. Inspect tire sidewalls frequently for oxidation, discoloration and/or signs of visible cracking. If in doubt as to the tires condition, have a professional inspect them for you. This is especially important if the tires are several years old and have accumulated many miles. Replace the tire if you see cuts, bulges, peeling tread or other signs of damage. Remove stones and other objects stuck in the tread. **Be certain to check wheel lug nut torque** and tire pressure as outlined in the tire section in this manual's **On the Road** chapter.

<b>▲ Note</b>
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**The most common causes of tire failure are overloading and under inflation. See Loading and Tires sections in the On the Road chapter.**

### **Brakes**

On a regular basis, have the brakes on both vehicles inspected. Be sure that necessary adjustments are made and any damage or worn parts are replaced.

Read and understand your manufacturers owner literature.

### **Hitch**

Check the nuts, bolts, and other fasteners to ensure that the hitch remains secured to the tow vehicle and the coupler remains secured to the trailer. The connection point may require periodic lubrication to permit free movement of the coupler to the hitch ball.

Read and understand your manufacturers owner literature.

## **WIRING**

Make sure connector-plug prongs and receptacles, light bulb sockets, wire splices, and ground connections are clean and shielded from moisture. Lightly coat all electrical terminal connections with non-conducting (dielectric) light waterproof grease.

Clean the prongs with very fine sandpaper, being careful not to damage the contact area.

Clean the surface deposits in the connector holes. (Make sure lights are off to prevent blowing a fuse) Try to clean off only the deposits and lubricate lightly with dielectric light waterproof grease.

### **Tire Replacement**

Replacement tires must be the same size and should equal or exceed the weight carrying capacity of the original equipment. The original equipment tires supplied on your trailer have capacities to support Gross Axle Weight Ratings (GAWRs) as stated on the Federal Certification Tag located on the front left side of your trailer. Radial and bias ply tires must never be mixed on the same axle.

## **Wheel Replacement**

Replacement wheels must be of the same size, type, and load capacity as the original equipment. See your authorized Outdoors RV dealer to obtain correct replacement.

## **Battery Maintenance And Care**

Refer to the **Battery Inspection and Care** section in this manual **Electrical Information**.

## **Appliance Maintenance**

For individual appliance care, refer to the appliance manuals in your **Owner's Information Package**

## **Water And Holding Tank Maintenance**

Refer to this manual's **Plumbing System** chapter.

## **Roof Resealing And Care**

For maintenance or repair purposes, you must put down at least a 48" X 48" piece of plywood at least 3/8" thick to distribute the weight.

Inspect the roof at least every six months, paying particular attention to the seams where the areas of sheetmetal, rubber and/or fiberglass are joined.

Carefully inspect the flange connections between air conditioner, vents, skylights, etc. If signs of cracking, weathering, or drying are evident, reseal as follows:

1. Remove any loose or cracked sealant being careful not to damage the roof. Use a wooden or plastic tool that will not gouge, pierce, or otherwise damage the roof.
2. Clean all areas requiring repair with a soft brush. This is to be done dry. Do not wash with soap and water or solvents. Be sure the surface is as dust-free as possible.
3. Check and tighten any loose fasteners. Be careful not to over-tighten, or stripping will occur.
4. Apply the new sealant, such as a quality acrylic caulk (not silicone) in a continuous bead along the seams and flanges, being careful not to leave any voids. Apply enough sealant to flow over the heads of all fasteners.
5. Allow at least 48 hours for sealant to set completely (firm and tack-free when firmly pushed with the thumb) before washing or waxing the trailer.

<b>▲ Warning</b>
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**Roof materials are slippery when wet.**



## **Rubber Roof System**

The rubber roof will provide many years of protection with only routine maintenance. The roof material is constantly exposed to ultraviolet radiation from the sun, atmospheric contaminants, pollution, dust and other compounds. These materials react with each other and some compounds in the rubber roof material, and collect on the surface of the rubber. When combined with water, some of the elements may create molds and mildew. Some leaching of the plasticizer in the rubber roof material may cause a chalky-looking substance to form.

This material builds up over time. It may flake or chalk off, or become dissolved and run down the sides of the trailer. You may perceive this as deterioration of the rubber roof material itself. This is not the case. As the rubber material ages, it actually loses only 1/1000" per year. What you see flaking and chalking is really just an accumulation of debris collected on the surface of the rubber.

This accumulation of material can be reduced or eliminated with routine clearing.

## **Cleaning**

For normal cleaning, standard household detergent or cleaners may be used. Use a nonabrasive, common household detergent and plenty of water. A light, medium-bristle scrub brush (**NOT wire brush**) can be used in place of a sponge. The scrub brush is better at loosening the accumulation. Kitchen cleaners can be used to remove stubborn stains. Avoid abrasive cleaners.

Rinse the roof and sidewalls thoroughly to reduce streaking from residue.

## **Care**

The rubber roof itself does not require annual coatings or additional sealants. Periodic washing with soap and water is all that is required.

After cleaning, a silicone-based dressing such as 303® Protestant can be applied to help keep the roof material flexible, and to help seal the surface from other contamination. In cases where excessive chalking is evident, PEMCO® 9010/4034 two-part roof coating can be applied. This will restore the roof's appearance (other than irremovable stain) and will help reseal the roof surface. Follow the instructions included with 303® Protestant and/or PEMCO® roof coating.

The rubber roof material can be cut by sharp objects. Use caution when loading sharp articles on the roof. If you add accessories or new equipment on the roof, be sure the installer is qualified to work on the rubber roof material. This is required under the terms of the warranty.

Repair kits are available through your dealer. The roof requires special adhesives and materials.

Do not use silicone sealants.

## **Trailer A-Frames And Bumpers**

There is very little that can go wrong with trailer A-frames and bumpers. Periodically inspect all the hardware attached and tighten if necessary. A-frames and bumpers should be washed to prevent the buildup of road grime and dirt. Touch-up paint should be used on all scratches and paint chips to prevent rust. A coat of paste wax will help keep them clean and protected from the elements.

## **Maintenance Guideline**

For your convenience, a maintenance guideline is presented. Options and accessories usually have their own/user manuals that often contain maintenance instructions.

**Maintenance**

	A	B	C	D	E	F
Inspect safety Chain	•					
Inspect brake wiring, connector, plug and receptacle	•					
Inspect hitch components	•					
Test breakaway switch	•					
Check tire for wear and damage	•					
Check wheel lug nut torque	•					
Check exterior lamp operation	•			•		
Inspect Propane system components	•			•		
Inspect/clean battery, cables, terminals	•					
Check battery charge (in storage)	•					
Check battery electrolyte (in use)	•					
Lubricate coupler and latch	•					
Wash exterior	•					
Wax exterior				▲	•	
Check slide-out room function and sealing (if equipped)	•					
Lubricate and adjust exterior locks, hinges, roof vents,				▲	•	
Adjust and lubricate window mechanism, etc.				▲	•	
Lubricate TV antenna (if equipped)				•		
Check all exterior sealants / reseal if necessary	▼		•			

*(continued on next page)*

**A - Each Trip or Monthly**

**B - Weekly**

**C - Every 3 Months**

**D - Every 6 Months**

**E - Each Year**

**F - At Specified Mileage or Interval**

**▲ - Severe Climate and/or Extreme Use**

## Maintenance

	A	B	C	D	E	F
Inspect and clean appliance vents, water heater, furnace, etc.		•		•	•	
Inspect, test and service safety equipment, fire extinguisher, Propane*, CO*, and smoke* detectors/alarms, and GFI receptacles	•			•	•	
Service appliances and equipment: refrigerator, roof air conditioner, generator, etc.				•		•
Service furnace				•		•
Clean breakaway switch contacts			•			
Lubricate breakaway switch pin			•			
Inspect and clean water pump filter			▲		•	
Inspect all hot, cold drain plumbing				▲	•	
Sanitize fresh water tank					•	
Complete Propane pressure check and system check			▲ □		□	
Check Brakes for function and noise**		•				
Inspect brakes and suspension system					□	
Pack wheel bearings					□	
Check water purifier cartridge (if equipped)					•	
Clean interior (as necessary)						

Annual battery replacement for safety detectors/alarms is recommended regardless of battery condition.

If function is in question or noise is present, it is recommended to have the brake system checked by qualified personnel.

Items marked with □ require special equipment and/or qualified personnel.

A- Each Trip or Monthly

B- Weekly

C- Every 3 Months

D- Every 6 Months

E - Each Year

F - At Specified Mileage or Interval

▲ Severe Climate and Extreme Use

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# STORAGE

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## STORAGE CHECKLISTS

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The following checklists will help you perform the steps necessary to prepare your trailer for storage conditions you anticipate.

These checklist do not include every detail required, and you may want to expand them to suit your needs. Contact your dealer for additional suggestions suitable to your climate and storage conditions, particularly extremes of hot and cold.

### Short-Term Storage (Less than 60 Days)

1. Wash the trailer exterior and underside. Hose off accumulations of mud and road salts.
2. Thoroughly clean the interior of the trailer, including carpets, counter tops, lavy, tub and shower, and galley.
3. Inflate tires to maximum rated cold pressure.
4. Park the trailer as level as possible front to rear and side to side. Block wheels front and rear.
5. Check the charge in the battery. Recharge as necessary.
6. Disconnect battery cables. Clean terminals, top and sides of batteries and battery boxes. Reinstall cables, dress with a battery terminal spray.
7. Use battery disconnect switch(s), if equipped.
8. Drain black, grey and potable water tanks.
9. Winterize, if appropriate. (See **Winterization** section in this manual.)
10. Turn off water pump and water heater switches.
11. Turn off Propane at the cylinder valve.
12. Turn off refrigerator and furnace.
13. Turn off range and oven burner valves and pilot valve (if equipped).
14. Remove all perishables from refrigerator and galley cabinets. Block refrigerator door(s) open to reduce odor buildup. An open box or tray of baking soda in the refrigerator will absorb odors.
15. Open closet doors, drawers, and cabinets so air can circulate.
16. In warm or hot climates, slightly open (suggested - 1/4") roof vents for ventilation. In cold climates, close and cover all vents to prevent entry of snow, etc.
17. Close and lock all windows. Be sure vent fan and range hood fan switches are off.
18. Cover exterior appliance vents (water heater, furnace, range hood, refrigerator) to prevent insects from getting in, be sure to remove all covering material before using appliances or vents.
19. Cap or close holding tank drain, city water inlet and fresh water fill spout.
20. Turn off all radios, TV's, interior and exterior lights.
21. Close curtains and/or mini-blinds, and pull shades.
22. Disconnect and store the 120-volt power cord.
23. Cover tires with cloth, plywood, or aftermarket tire covers.
24. Prepare generator (if equipped). Refer to generator operating manual included in your **Owner's Information Package**.

## Storage - continued

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### Long-Term Storage (Over 60 Days)

1. Perform all steps as required for short-term storage.
2. Operate air conditioner(s) to lubricate compressor seals.
3. Charge and remove the battery. Store in a cool, dry place, and check the charge and water level every 30 days. If the specific gravity is being checked, recharge the battery when it drops to 1.220.

#### NOTE

If your trailer is equipped with a solar battery charger, it will trickle charge the battery. The battery disconnect switch must be ON for the solar charger to charge the battery.

4. Remove, clean and replace roof air conditioner filter(s). Cover the air conditioner shroud(s)
5. To help preserve the tires, park each tire on a piece of plywood about 12 inches square.
6. Cover the windows on the inside with foil, cardboard, paper, etc., to reduce curtain, drape, and carpet fading.
7. Remove batteries in battery-powered devices.
8. During extended periods of storage, gasoline may deteriorate due to oxidation. This can damage rubber and other materials in the fuel system. It may also clog small orifices. Commercially available gasoline fuel stabilizers should be added whenever actual or expected storage periods exceed 60 days. Follow the additive manufacturer's instructions. Operate the vehicle regularly during the storage period to mix and circulate the antioxidant agent throughout the fuel system.
9. Check tire inflation pressures every 30 days. Maintain maximum rated cold inflation pressure.
10. Check the sealant around all roof, floor and body seams and windows. Reseal if necessary. See **Sealant Renewal** section.
11. Lubricate all locks and hinges as described in the **Maintenance** chapter.
12. Remove high grass or weed growth if coach is parked on dirt. Caution should also be taken to prevent rodent intrusion when parked in remote areas and the unit should be checked periodically for any signs of intrusion. While measures are taken at manufacturer to prevent intrusion, rodent intrusion is not covered under the warranty so customers may need to take extra steps to protect their travel trailer.

#### CAUTION

Customers may need to take extra steps to protect their travel trailer in the event of inclement weather conditions. Damage resulting from inclement weather may not be covered by your warranty.

## WINTERIZATION

Thoughtful planning and preparation for the winter season can help eliminate equipment failures and breakdowns, and can extend the life of your trailer and its systems. Your dealer can advise you concerning specific winterization procedures and products for your climate area or the areas through which you will be traveling.

Your dealer may also provide winterization service for all appliance and systems in the trailer. The following is a check list if you prefer to perform these procedures yourself:

1. Service and winterize the generator as outlined in the generator operating manual included in your **Owner's Information Package**.
2. Winterize the Propane system. Your Propane dealer or service station will perform this for you.
3. Winterize all appliances as outlined in the individual operator's manuals.
4. Remove snow accumulations as often as possible.

### Water System Winterizing

Read this section completely before performing winterization.

#### CAUTION

Draining the water system alone will not provide adequate cold weather protection. If the trailer is to be unheated during below freezing temperatures, consult your dealer for the best winterizing procedure for your climate. Your dealer can winterize your trailer for you or can supply you with one of the special antifreezes which are safe and approved for use in RV water systems. Follow the instructions furnished with the antifreeze.



#### WARNING

Do not use automotive or windshield washer antifreeze in the trailer water system. These solutions may be harmful if swallowed.

1. Remove water filter cartridge, if equipped, and install the winterizing adapter.
2. Drain the fresh water tank by opening the water tank drain valve. Close valve when drained.
3. Turn water pump on (12-volt power must be on).
4. Open a cold water faucet. When the flow of water stops, turn the pump off.
5. Open water faucets, then open the drain valves on HOT and COLD water pipes. Leave these valves open.
6. Drain the water heater by opening the drain plug at the bottom of the heater and the safety valve at the top.
7. Flush the toilet. Operate toilet sprayer, if equipped.
8. Drain the shower head by opening the valve. Let all water drain out the tub spout. Leave the valve open.
9. When each faucet has been drained, close all faucets, water line drain valves and the fresh water tank drain valve, install the water heater plug and close the safety valve.
10. Drain the waste water system by following the normal procedure for draining the holding tanks. (See **Plumbing chapter**).
11. Apply silicone lubrication to the knife valve actuator rod(s).
12. Be sure ALL water from ALL plumbing fixtures has been drained.
13. Close holding tank drain valves.
14. Locate water pump, and close the winterization pick-up tube under the trailer directly below the water pump.
16. Remove threaded plug from the pick-up tube.
17. Place the pick-up tube in a container of approved non-toxic antifreeze below the trailer.
18. Turn water pump on (12-volt power must be on). Pick-up tube should begin drawing antifreeze from the container.
19. Open each water faucet, run the water pump and let about a cup of antifreeze solution flow continuously through each faucet. Close each water faucet.
20. Flush the toilet until the antifreeze solution flow continuously. Release flush mechanism.
21. Your trailer may be equipped with a water heater bypass. Winterize the hot water lines by opening each hot hot water faucet, allowing antifreeze solution to flow continuously, and then close each faucet. This will require considerably more antifreeze solution, and you may choose to do this step before winterizing the cold water lines so you can recycle the solution.

#### NOTE

When filling the plumbing systems with antifreeze, be sure to open and operate all fixtures and valves allowing the antifreeze solution to flow freely.

## Storage - continued

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22. Pour one cup of antifreeze solution down each drain.
23. Install protective caps:
  - Waste tank drain outlet cap
  - Winterization pick-up tube plug
24. If your refrigerator is equipped with an ice maker, winterize it as follows:
  1. Shut off the water supply valve to the ice maker.
  2. Place a shallow pan under the water solenoid valve.
  3. Remove the inlet fitting to the ice maker water solenoid valve. Drain the water from the supply line.
  4. Remove the plastic nut and water line from the outlet side of the water solenoid valve. Drain water from the line.
  5. Cycle the ice maker several times while blowing compressed air through the water solenoid valve. Be sure all water is out of the solenoid. **NOTE: Your trailer dealer can do this for you.**
  6. Reconnect and tighten the lines on the solenoid valve. Leave the water supply turned off until temperatures are above 32°F/0°C.
  7. Dry out the ice maker mold assembly with a soft cloth. Place the bail arm to the **UP/OFF** position.

### REACTIVATING THE TRAILER AFTER STORAGE:

If the trailer was properly and carefully prepared for storage, taking it out of storage will not be difficult. The following procedure check list assumes that you stored the trailer with care. If you didn't, and extensive freeze damage or other serious deterioration has occurred, please consult your dealer or any authorized Outdoors RV dealer for advice.

1. Thoroughly inspect the outside of the trailer. Look for animal nests in wheel wells or in other out of the way places.
2. Remove all appliance vents, ceiling vent and air conditioner coverings. Be sure all furnace, water heater, and refrigerator openings are clear and free of debris or insect nests, webs, etc.
3. Open all doors and compartments. Check for animal or insect intrusion, water damage, or other deterioration.
4. Check charge level in batteries, refill and recharge as necessary. Reinstall batteries if necessary. Be sure cable ends and terminals are clean and free of corrosion.
5. Check tire pressures. Inflate to specified cold pressure.
6. Remove covering from inside windows.
7. Open vents and windows for ventilation.
8. Drain, flush, and sanitize the fresh water system as outlined in the **Plumbing** chapter.
9. Install a new water filter cartridge (if equipped).
10. Operate all faucets and fixtures in the fresh water system. Check for leaks at all joints and fittings. Repair if necessary making sure the water heater bypass is open.
11. Check operation of 12-volt circuit breakers and inspect fuses. Replace as necessary.
12. Operate all 12-volt light and accessories.
13. Install new batteries in battery-operated devices. Check operator's manual for each device for any additional requirements.
14. Test carbon monoxide, Propane and smoke detectors/alarms.

## Storage - continued

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15. Check monitor panel operation.
16. Operate vents and vent fans, including the range hood fan.
17. Inspect the 120-volt electrical system - power cord, converter, all outlets, and any exposed wiring. If defects are found, refer service to your dealer or an authorized Outdoors RV Dealer.
18. Prepare the generator for operation following instructions in the generator operating manual in your **Owner's Information Package**.
19. Start and run the generator.
20. Operate 120-volt appliances and air conditioner(s). Be sure to uncover air conditioner shroud(s).
21. Inspect the Propane system and check for leaks as described in the **Propane System** chapter. If the Propane cylinder shows signs of rust or corrosion, have it inspected by a qualified Propane technician.
22. Operate each Propane appliance. Have the Propane regulator adjusted for proper pressure by a qualified Propane technician.
23. Inspect and clean the interior.
24. Check the sealant around all roof, floor and body seams and windows. Reseal if necessary. See **Sealant Renewal** section.
25. Lubricate all exterior locks, hinges and latches.
26. Wash and wax the exterior. Inspect the body for scratches or other damage. Touch up or repair as necessary. Flush the underside thoroughly.

Your trailer should now be ready for a new traveling season. If you choose, your dealer can double check your preparation and repair any problems or make any necessary adjustments.



## Glossary

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**Hitch Rating** - Means the maximum allowable weight of a towed trailer or towed vehicle. The GCWR of the trailer must never be exceeded, even if the weight of the towed trailer or towed vehicle is less than the hitch rating.

**Monitor Panel** - An electronic device that allows you to conveniently measure the approximate levels in the fresh water, grey and black water tanks. You can also check the charge in the battery / batteries.

**MTW - (Maximum Tongue Weight)** - Is the maximum permissible downward force exerted on the hitch ball by the towed vehicle coupler.

**NOTE** - A statement or instruction in this Owner's Manual with information to help you use the vehicle or equipment more efficiently, such as a tip.

**Owner's Information Package** - This is a package of papers, manuals, warranty and instruction cards, and other material put together for you by Outdoors RV. These materials contain operating and maintenance instructions for most of the components and appliances in your trailer.

**Park Cable** - The F-style video connector that allows you to connect to an outside television signal source, such as the cable TV feed at an RV park, or any other 75-ohm video source. This connector usually carries an RF modulated signal.

**Park / City Water Connection** - The "garden-hose" style connector that allows you to connect to an outside connection of an outside pressurized water source.

**Power/Shore Cord** - This is the main power cord coming into your trailer electrical system. You connect it to 120-volt AC power at a park campsite.

**Roadside** - The left side of the trailer from the driver's point of view. So named because, at least in North America, the "road" outside the vehicle is usually on this side.

**MTW ( Maximum Tongue Weight)** - The maximum permissible downward force exerted on the hitch ball by the towed vehicle coupler.

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

**VIN ( Vehicle Identification Number)** - The legal, 17-digit vehicle identification number as shown on the vehicle registration certificate.

**WARNING** - A statement or instruction in this *Owner's Manual* that, if not followed, could lead to personal injury or death.



