



***Dutchmen***

**Fifth Wheel & Travel Trailer  
Owner's Manual**



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# 1. Introduction

Thank you for purchasing a Dutchmen Recreational Vehicle. For over 20 years Dutchmen Manufacturing has been building quality recreational vehicles that have been recognized for innovative designs, superior quality and outstanding service support after the sale. Working closely with our dealer partners, we are committed to do our best to assure you experience an enjoyable ownership experience. Welcome to our family, and we wish you many safe and rewarding journeys in your new Dutchmen Recreational Vehicle.

## About This Owner's Guide

This Owner's Guide describes many of the features and components of your RV, including operation and maintenance. It is intended to help you operate, care for and maintain your RV. Information contained in this guide, including photographs and illustrations, are based on the latest product information available at the time of publication and are subject to change without notice. This guide may not reflect the exact component, equipment, accessory or system in your RV, including interior or exterior décor or design options. Some may not apply to your RV or be available in your specific model. There is nothing within this guide that creates any warranty, expressed or implied. The information contained within is intended as a guide, and is not meant in any way to supplement, alter or supplant the Dutchmen One-Year Limited Warranty or other warranties supplied by manufacturers of the RV's components.

Procedures outlined in this guide are typical for normal operating conditions. You are responsible for the safe operation and use of your RV, and we have tried to include as much information as possible to assist you. There are occasional tips to help you enjoy the recreational lifestyle, however this guide is not intended to teach you how to camp, or where. There are numerous publications that can tell you everything you want to know about RV'ing. If you ever have any questions or need help with operation, maintenance or service, contact your Dutchmen Dealer or Dutchmen Customer Service (574-537-0700).

## Owner's Information Package

Your new Dutchmen included an Owner's Information Package that contains valuable documents regarding your RV and its many components. Critical are the

various component manufacturers warranty registration cards and specific product information contained within. Some component manufacturers offer warranties beyond that offered through the Dutchmen Limited Warranty. Some components are excluded from the Dutchmen Limited Warranty and are warranted separately and exclusively by the component manufacturer. Activation of these warranties is critical, so review all information contained within this package, and complete the required registration steps as soon as possible.

## Safety First!

Above all else, the most critical factor with your new RV is your safety and that of others. This includes occupant safety, safe operation, safe maintenance and safe driving. Safety Alert symbols and words are used both in your RV and throughout this guide. These statements are critically important, so please pay close attention whenever they appear.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to personal injury. This applies to hazardous situations involving property damage only.



NOTE is used to notify you of important information regarding the maintenance of your recreational vehicle.

Warning, caution and information labels and tags are attached to many interior and exterior surfaces and components of your RV. They are meant to be permanent. Do not remove these labels and tags.

### **Tow Vehicles**

Regarding tow vehicle use in connection with the use and operation of Dutchmen recreational vehicles, Dutchmen customers and owners of Dutchmen recreational vehicles 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 the customer's choice of RV. Dutchmen further disclaims any liability with respect to damages which may be incurred by a customer or owner of Dutchmen recreational vehicles as a result of the operation, use or misuse of a tow vehicle.

Always be sure to understand your tow vehicle towing capacity. The Gross Vehicle Weight Rating (GVWR) of your RV must not exceed your tow vehicle's towing rating. If purchasing a new tow vehicle, be sure to tell your dealer the size, type and GVWR of your RV to confirm proper vehicle tow capacity.

### **Important Safety Precautions**

Following is a summary of critically important safety precautions and recommendations that are covered in more detail throughout this guide:

#### **Passenger Safety**

Do not allow passengers to ride in the trailer during travel. The transport of people puts their lives at risk and may be illegal. The trailer does not have seat belts and therefore, it is not designed to carry passengers. Please see Chapter 2 for more information.

#### **Reducing Swaying or Fishtailing**

Sway or fishtailing is the sideways action of a trailer caused by external forces. Excessive sway of your trailer can lead to the rollover of the trailer and tow vehicle resulting in serious injury or death. Be sure to follow the instructions and warnings as outlined in Chapter 8.

#### **Towing and Weight Distribution**

Weight distribution is an important factor when loading your fifth wheel or travel trailer. Properly loading your trailer will help increase towing efficiency and reduce the likelihood that you will experience load-related

towing trouble. Please see Chapter 7 for more information on proper loading.

### **Correct Tire Pressure and Maintenance**

Properly maintained tires improve your trailer's steering, stopping, traction and load-carrying capability. Under-inflated tires and overloading are major causes of tire failure. For more information on tire safety, please see Chapter 6.

### **Wheel Nut Tightening (Torquing)**

Inadequate and/or inappropriate wheel nut torque (tightness) is a major reason that wheel nuts loosen while traveling. Loose wheel nuts can cause a wheel to fall off the trailer with serious safety consequences. You must be familiar with the proper procedure and how to properly tighten the wheel nuts. Please see Chapter 6.

### **LP Gas Appliances and Equipment**

The appliances (stove, refrigerator, outdoor grill, etc.) and equipment such as water heater, furnace, generator, etc. typically operate on propane gas. Propane is flammable and is contained under high pressure. Improper use of propane may result in a fire and/or explosion. Be sure to follow all instructions and warnings in this guide as well as the specific owner's manuals of the appliances and equipment.

### **Generator Safety**

Do not operate the generator in an enclosed building or in a partly enclosed area such as a garage. Do not operate the generator while you or any trailer occupants are sleeping in the trailer. Be sure to follow instructions and warnings in this guide (see Chapter 12) and in the generator operating manual.

### **Mold**

Mold and mold spores are found throughout the environment, both indoors and outdoors. There is no practical way to eliminate all mold and mold spores indoors. To help control the growth of mold, you must control indoor moisture and humidity. Please see Chapter 4 for more information on controlling moisture.

## Reporting Safety Defects

### *In The United States*

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Dutchmen Manufacturing.

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

To contact NHTSA, you may either call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to <http://www.safercar.gov>; or write to: Administrator, NHTSA, 1200 New Jersey Avenue, S.E., Washington, DC 20590. You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

### *In Canada*

If you believe your RV has an alleged safety defect that could cause a crash or cause injury or death, you should immediately contact the Motor Vehicle Safety Enforcement division of Transport Canada and Dutchmen Manufacturing.

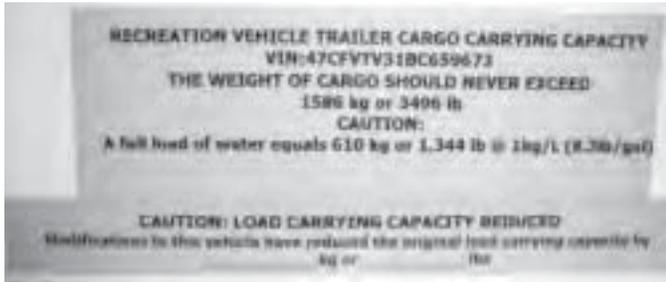
To Contact Transport Canada, you may call the Road Safety and Motor Vehicle Regulation Directorate, 800-333-0510 or 613-993-3640 (if calling from Ottawa Region); go the [www.tc.gc.ca](http://www.tc.gc.ca), or write to: Motor Vehicle Safety Enforcement, Transport Canada, 2780 Sheffield Road, Ottawa, Ontario K1B 3VP.

## Manufacturing Certification



Dutchmen Manufacturing vehicles are constructed to the rigorous safety standards established and frequently audited by the Recreational Vehicle Industry Association (RVIA) and Transport Canada (CSA). The above labels affixed to your vehicle indicate that it was built to these standards. RV's built for sale in Canada may differ to conform to Canadian codes and regulations. Dutchmen Manufacturing reserves the right to make design, construction and/or specifications changes at any time without notice and without incurring any obligation whatsoever.





The Cargo Carrying Capacity calculation label is located on the lower inside edge of the primary entrance door. These terms are explained in more detail in Chapter 7.

## 2. Safety First

Your trailer was designed with comfort and safety as a priority. It complies with applicable codes and safety standards in effect at the time it was built. A number of required safety items are installed in your trailer for your safety and the safety of other occupants of the vehicle. This section describes several of these important features. Other chapters in this Owner's Guide describe important safety topics specific to the systems or components discussed in those chapters.

### Safety as a Priority

Consider the personal safety of you your family and others (including pets) while camping or using your recreational vehicle as your top priority. Understanding your RV and the various safety components, including alarms and egress (or escape) locations, is critical. With proper precautions & planning you can insure a safe and trouble free trip. You are encouraged to develop a family safety plan that is practiced (in light & darkness) and understood by all family members. Important elements of your safety plan should include:

- Understanding the various alarms (CO<sub>2</sub>, LP, Smoke), what they sound like and what they mean.
- What to do when an alarm is heard (explained below).
- Where and how to shut off all gas appliances (water heater, range/oven, furnace, refrigerator).
- Where and how to shut off the main LP gas valve at the tanks.
- How to operate egress windows.
- How to unlock the entry door (s) from inside.
- How to operate the fire extinguisher (P.A.S.S. – Pull pin, aim low, squeeze, sweep).
- Practice evacuating the RV (blindfolded).
- What to do in case of a fire (stay low, stop/drop/roll technique, etc.).
- Have a plan for meeting at a predetermined point outside the RV to make sure everybody is accounted for.
- Have a plan for pets.
- Have a weather plan (for watches & warnings) and know where to seek shelter.

- Before leaving on a trip, make sure you communicate your plans to family members or friends and let them know how you can be reached.
- When traveling to unfamiliar areas, find out prior to arrival the contact information for local emergency services, including hospitals.

This list may not be all inclusive, and should only serve as a guide in developing your safety plan. Above all else, keep the safety of you, your family, guests and pets as your top priority.

All occupants of the trailer should become familiar with the the audible sounds of the carbon monoxide, propane and smoke detector/alarms. If an alarm sounds, exit the R.V. immediately and do not re-enter until it is determined to be safe. Do not remove the detector/alarm in an attempt to silence the alarm. If any occupants of the trailer suffer from diminished hearing, add additional detector/alarms.

### Carbon Monoxide Safety Pre-Cautions

Carbon monoxide is a colorless, tasteless, odorless gas. The generator (if equipped), furnace, water heater, propane refrigerator and cooking range/oven produce it constantly while they are operating. CARBON MONOXIDE IS DEADLY. To protect yourself from the effects of carbon monoxide poisoning, please read and understand the following precautions.

There are a number of symptoms of carbon monoxide poisoning:

**Dizziness, Intense headache, Throbbing in temples, Nausea, Vomiting, Muscular twitching, Weakness/sleepiness, Inability to think clearly**

If you or others (including pets) experience any of these symptoms, get out into fresh air immediately. Get medical attention if any of the symptoms persist. If any fossil-fuel burning device or appliance is running, shut it off and do not operate it until it has been inspected and repaired.



*Exhaust gases are deadly. Do not block the tailpipes, or appliance exhaust ports, or situate the vehicle in a place where the exhaust gases have any possibility of accumulating either outside, underneath, or inside your vehicle or any nearby vehicles. Outside air movements can carry exhaust gases inside the vehicle through windows or other openings remote from the exhaust outlet. Operate the*

engine(s), carbon monoxide-producing systems or components only when safe dispersion of exhaust gases can be assured. Monitor outside conditions to be sure that exhaust continues to be dispersed safely.

## **! WARNING**

Do not under any circumstances operate any engine while sleeping. You would not be able to monitor outside conditions to assure that engine exhaust does not enter the interior, and you would not be alert to exhaust odors or symptoms of carbon monoxide poisoning.

### Carbon Monoxide Detector/Alarm



A battery-powered carbon monoxide (CO) detector/alarm is installed in or near the main sleeping area. Detailed operating and maintenance instructions are in the Owner's Information Packet.

If the alarm sounds, it means that carbon monoxide gas is present in the air. This situation could occur in campgrounds where other vehicles as well as your trailer are contributing to the level of carbon monoxide in the surrounding air. If the alarm sounds, it does not indicate a faulty alarm. It is warning you of potentially dangerous levels of carbon monoxide.

When the alarm sounds:

1. If anyone has symptoms of CO poisoning, immediately move all occupants to fresh air. Be sure to account for all trailer occupants including pets. Do not go back into the trailer until the source of the carbon monoxide has been located and repaired.
2. Turn off all sources of combustion at once: generator, furnace, water heater, range/oven.

3. Ventilate the interior of the trailer with fresh air. Open all doors, windows (except emergency exit window), and vents.
4. Have a qualified technician locate and correct the source of the carbon monoxide.

Test the carbon monoxide detector weekly, after the trailer has been in storage, and before each trip. Replace the battery at least twice a year or immediately when the low battery signal sounds. If the CO detector fails to operate with a new battery, replace it with a new detector.

## **! CAUTION**

Do not spray paint or spray either the CO or propane detector with chemicals such as cleaners, air fresheners, hair sprays, insecticides, etc. These substances will damage the detectors requiring replacement of the detectors. Keep flames or other intense heat sources away from the detectors.

### Propane Leak Detector



A propane leak detector is mounted near the floor. It is powered by the trailer 12-volt DC system. The detector senses the presence of propane and some other hydrocarbons. If propane is detected, the alarm will sound. The detector will not automatically shut off the propane system.

See the propane leak detector operating instructions in your Owner's Information Packet for detailed operating and maintenance instructions.

If the alarm sounds, exit the trailer and turn off the gas at the LP tank. Make sure everyone is out of the R.V. including pets. Do not re-enter the trailer until the alarm stops.

- Open entrance doors, windows and vent openings;
- Turn off all appliances including the furnace and hot water heater;

- Do not touch electrical switches.
- Have the propane system checked and the leak source corrected by a qualified propane dealer or RV service center before using the system again.

Clean the propane detector frequently by carefully vacuuming the front cover. Do not spray any kind of cleaning solution into the detector.

### Smoke Detector



A battery-powered smoke detector is mounted on the ceiling in the living/cooking area of the trailer. Detailed operating and maintenance instructions for the smoke detector are in your Owner's Information Packet.

Never disable the smoke detector because of a nuisance or false alarm from cooking smoke, dusty furnace, etc. Ventilate the trailer interior with fresh air and the alarm will normally shut off. Do not disconnect or remove the battery.

Replace the battery at least twice a year or immediately when the low battery signal sounds. If the smoke detector fails to operate with a new battery, replace it with a new detector.

### Fire Safety

The hazard and possibility of fire exists in all areas of life, and the recreational life-style is no exception. Your trailer is a complex product made of many materials. Some of these materials are flammable. Like most hazards, the possibility of fire can be minimized, if not totally eliminated, by recognizing the danger and practicing common sense, safety and good maintenance.

### **WARNING**

*Some upholstered components and mattresses, carpet, and insulation products are made of urethane foam. Urethane foam is flammable! Urethane foams burn rapidly, releasing great heat and consuming oxygen very quickly. Lack of oxygen is a danger of suffocation hazard. Hazardous gases released by the burning foam can be incapacitating or fatal to human beings if inhaled in sufficient quantities.*

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

### **WARNING**

*A fire extinguisher is located in the entry way. It is rated for Class B (gasoline, diesel fuel, grease, flammable liquids) and Class C (electrical) fires. Read the instructions on the fire extinguisher, and know when and how to use it. The fire extinguisher is most valuable when used immediately on small fires. It has a limited amount of fire-extinguishing material, and must be used properly so this material is not wasted.*

*The fire extinguisher is a pressurized, mechanical device. It must be handled with care and treated with respect. It should be checked at least once a year. Replace the fire extinguisher whenever it has been discharged. Always follow any instructions printed on the fire extinguisher.*

### Fire Safety Precautions

Instruct all occupants in the trailer on what to do in case of fire. Hold fire drills periodically.

Be especially aware that potentially explosive fuel vapor may be present at fuel filling stations. Never enter a fuel filling station if the generator is running, or if your water heater, furnace, or refrigerator is operating on propane. The flame in the burners of these appliances is a source of ignition, and could cause an explosion. These appliances must be turned OFF before entering a fuel filling station. Turn off the main propane valve.

### **WARNING**

*Before refueling your tow vehicle, be sure to turn off all pilot flames and appliances in the trailer. Turning off the propane at the tank is insufficient. Pilotless appliances may still spark or pilot flames may not extinguish immediately. Failure to follow critical safety precautions could result in a fire or explosion resulting in personal injury.*

If you experience a fire while traveling, maintain control of the trailer until you can safely stop. Evacuate the tow vehicle as quickly and safely as possible. Account for all occupants, including pets.

Consider the cause and severity of the fire and the risk involved before attempting to put it out. Move a safe distance away from the vehicle and wait for emergency fire assistance.

If the trailer is damaged by fire, do not occupy it until you have had it thoroughly inspected. Report all fires to Dutchmen.

Do not store or carry propane containers, or other flammable liquids inside the trailer.

### Emergency Escape Windows



*Do not cover or obstruct emergency exit windows. These windows must be accessible at all times for emergencies.*



Emergency escape windows, are located in the sleeping areas as well as the living/dining area in most models. When you park the trailer, check that trees, fences, walls, other RVs or other obstacles do not block the

emergency window operation. Also, while scenic views are one reason for traveling, DO NOT park where a body of water, steep cliff, or any other environmental hazard is just outside your escape window.

Make sure you have a clear escape path directly outside all egress windows. Instruct everyone in the trailer how to use the emergency exit windows. Occasionally open the windows to prevent the seals from sticking. Plan fire escape routes. Decide who will exit through the emergency escape windows first, and in what position. Place a blanket or heavy coat over the window frame to cushion the exit. If there is a fire, the last person to exit the trailer should be prepared to assist those in front. Arrange for a meeting place safely away from the trailer.

To open the emergency exit windows:

1. Release both RED latches or unlatch and swing the window push bar.
2. Push out on the glass or push bar until the window swings clear.



*DO NOT allow passengers to ride in the trailer during travel. Although in some places it may be legal for passengers to ride in the trailer while under way, Dutchmen, Inc. specifically discourages this practice. There are no seat belts or other passenger safety equipment installed in the trailer, and trailer movements could cause objects in the interior of the trailer to become dangerous projectiles, possibly causing serious personal injury.*

*The activities of passengers – especially children – in the trailer is difficult to monitor. Appliances and other equipment could be operated without the driver's knowledge. Some of these activities could involve the starting of fires or the improper operation of stored vehicles, electrical equipment or appliances that could cause a hazardous and unsafe driving situation.*

### Occupant And Passenger Safety

Carrying or allowing passengers (or pets) to ride in the trailer while you are travelling is dangerous. The trailer interior is not designed for passenger occupancy while under way. State and Federal vehicle safety laws require seats belts and passenger restraint systems in vehicle passenger areas. The trailer interior is not designed for or equipped with these systems. It cannot be modified or retrofitted to meet vehicle safety standards

and regulations for passenger occupancy. Additionally, some systems such as slide-out rooms can be operated, but should not be operated, while the trailer is being towed. Under some circumstances, carbon monoxide and other toxic gases and fumes from the tow vehicle exhaust can enter the trailer while being towed. It is also possible in some models to carry hazardous and/or toxic substances in the interior. Persons occupying the trailer while going down the road could be exposed to these fumes and gases, resulting in respiratory or other injury, or fatal carbon monoxide poisoning.

Since the driver of the tow vehicle cannot properly monitor the activities of any trailer occupants while towing, a dangerous situation could arise without the driver's knowledge. Even the best intercom and radio communications devices are not adequate to inform the driver of all potential hazards in the trailer. And, although an unlikely and remote possibility, the trailer could become detached from the tow vehicle, or a vehicle crash or overturn could happen, seriously injuring or even killing any trailer occupants.

### 3. Warranty & Service

Your Dutchmen RV was manufactured in accordance with industry standards established by the Recreational Vehicle Industry Association. In order to ensure that your RV provides you with years of enjoyment, it must be maintained properly. We suggest that you have all inspections, maintenance, and warranty services performed or coordinated by your selling dealer.

Even though every effort has been made at the factory to assure that systems and components operate correctly and within their design specifications when the trailer leaves the factory, problems may arise. For your protection, your Dutchmen trailer is covered under Dutchmen's One-Year Limited Warranty.

Dutchmen is committed to continuous improvement in the design and manufacture of our products. This commitment helps us make a product that utilizes the latest technology, is well-built and safe to operate.

Dutchmen wants you to enjoy a positive ownership experience. We are readily available to assist you in resolving product problems with your dealer or any component or appliance manufacturer.

Please note that Dutchmen reserves the right to authorize repairs in advance at our discretion, and to select the repair center and method of repair. In some cases, and only with factory warranty center authorization, Dutchmen may choose to pay transportation charges and expenses to relocate the unit to a service or repair center of our choice, including transportation back to the factory.

If you require our assistance, please feel free to contact contact Dutchmen Customer Service at:

*Phone: (574) 537-0700*

*Fax: (574) 537-0496*

**Mailing Address:**

Dutchmen Service  
P.O. Box 2164  
Goshen, IN 46527

**Shipping Address:**

Dutchmen Service  
2402 Dierdorff Rd.  
Goshen, IN 46526

**Dutchmen Dealer Responsibilities**

When you purchased your trailer, the dealer was to:

- Deliver the trailer to you in the best condition possible;
- Be sure the trailer was not damaged;

- Be sure the trailer was clean;
- Complete a pre-delivery inspection and perform various systems tests;
- Give you information about the operation, care and maintenance of the trailer;
- Explain the warranty to prevent any misunderstanding;
- Provide and coordinate quality service, maintenance and repair for the trailer.

**Owner's Responsibilities**

It is important to understand the difference between "defects" that are covered under the Dutchmen warranty, and "damage". Dutchmen is responsible for defects in materials, manufacturing and workmanship. On the other hand, Dutchmen has no control over "damage" caused by such things as collisions, misuse, and/or lack of maintenance which occurs after the trailer is delivered to you. Therefore, "damage" for any reason which occurs after the trailer is delivered to you is not covered under the warranty. Maintenance services are also excluded from the warranty because, as the RV owner, you are responsible for insuring that the trailer is inspected and maintained in good and safe operating condition. You are responsible for taking whatever measures necessary to maintain the trailer, including the exterior sealants of the unit as described in the Care and Maintenance section of this Owner's Guide. You are also responsible for operating the trailer in a manner that insures its safe use and the safety of other vehicles, and having necessary repairs made as soon as possible to prevent further damage to the RV.

By following the care and maintenance recommendations in this Owner's Guide and other operating and maintenance manuals included in your Owner's Information Packet, you will not only insure that the trailer is in good operating condition, but also maintain the value of the trailer. It is vitally important that you frequently inspect your trailer for irregularities, especially sealants around windows, doors and exterior attachments. Prevention of a problem is far less expensive and unpleasant than fixing it later. Protect your investment by frequent and thorough inspections, regular maintenance and timely repairs when needed.

Most states have consumer protection laws that outline specific steps that both you and the manufacturer of the vehicle must follow to remedy situations where

you believe the vehicle has a problem that substantially reduces the value, use, or safety of the vehicle. If you have any kind of problem with your trailer or selling dealer during the warranty period, Dutchmen wants to know about it. If you have a problem with your trailer, you have given your dealer a reasonable opportunity to fix the problem and the problem persists, please contact Dutchmen.

Please note: your Dutchmen Limited Warranty covers warrantable repairs that are performed by an authorized Dutchmen dealer at their service center or facility only. It is important for the dealer to know if you are unable to bring your unit in for repairs. Dutchmen is not responsible for any costs incurred for service call charges, or time accrued to come out to your unit. Your unit is a recreational vehicle and not intended, nor manufactured, as a permanent residence.

### **Making a Service Appointment**

- Call ahead - Think about an appointment time and call ahead. Mondays and Fridays and just before holidays are the busiest times at dealer service centers.
- Have the following available when you call:
  - V I N (last six digits)
  - Model
  - Date of Purchase
  - Description of the problem
- Be prepared - If warranty work is to be done, please have a copy of your warranty paperwork available and provide the service center with any helpful information on past repairs that may pertain and help technicians in diagnosing the problems.
- Make a list - Have a list ready and be reasonable with repair expectations. Some repairs may require special order parts or parts shipped from a manufacturer. Explain what you would like to have done in your "call ahead" or stop by the dealership ahead of time so that you and the service manager can discuss your needs and the time required for the service.

### **Obtaining Service**

Whenever you require service on your trailer, make arrangements to have the service performed as soon as possible. Don't wait until you're ready to use the trailer. Your dealer or service center may not be able to service

it immediately. Any parts required may have to be ordered. Normally, the dealer's service department is busiest on Mondays and Fridays and before holidays.

Write up a list of the services and/or repairs you require and provide this list to the Service Manager. If you have a long list of items to be serviced and need to have the trailer by the end of the day, list the items in order of priority. If all the items cannot be completed in one day, make arrangements to have them completed at a second appointment.

If you believe that the service is covered under the warranty, discuss the service with the dealer's Service Advisor before the service is done. All the work to be performed may not be covered and you should have an estimate of the costs.

After the service has been completed, inspect the work immediately and notify the Service Advisor of any dissatisfaction. Keep all service or repair related documents with the trailer and keep a Maintenance Log for reference.

**DUTCHMEN BASE LIMITED ONE YEAR WARRANTY***Warranty Coverage Provided:*

Except as excluded or limited below, Dutchmen Manufacturing, Inc. (hereinafter “Dutchmen”) WARRANTS for a period of one (1) year that Dutchmen will repair or replace components of your Dutchmen recreational vehicle that are defective in materials and/or workmanship supplied by and attributable to Dutchmen. This Limited Warranty is effective for a period of one (1) year from the date the recreational vehicle is retail delivered or first placed into service (whichever occurs first). Dutchmen, at its sole discretion, reserves the right to substitute parts or components of substantially equal quality, touch up cosmetic flaws, or make design and/or manufacturing improvements, as the exclusive remedy under this Limited Warranty. Owners must be properly registered with Dutchmen in order to obtain the benefits of this Limited Warranty. Warranty repairs, if required, will be made without charge and within industry standards after you take your recreational vehicle to an authorized service center. This Limited Warranty may be transferred by the original purchaser to a subsequent purchaser (with proper documentation); however, this Limited Warranty will not extend beyond the original one (1) year term.

*What Is Not Covered By This Limited Warranty:*

This Limited Warranty does NOT provide coverage for any of the following:

- Equipment, products, components, appliances and accessories not manufactured by Dutchmen;
- Vehicles used for business, rental, commercial, residential, or disaster relief purposes, or any other purpose other than recreational travel and family camping;
- Vehicles which were not purchased through an authorized Dutchmen dealer;
- Vehicles licensed, registered, or primarily used outside the United States or Canada;
- Routine maintenance and/or adjustments;
- Damage caused by misuse, abuse, modifications, alterations, neglect, lack of maintenance or by a third party;
- Unauthorized repairs, modifications or alterations to any system, component or part of the vehicle;
- Damage, wear or deterioration due to exposure to natural elements;
- Upholstery and other “soft goods” due to damage, puncture, fade, wear, spills;
- Damage as a result of overloading and/or improper weight distribution or balancing of load;
- Damage resulting from condensation, including water damage and the growth of mold, mildew or fungi;
- Environmental damage due to exposure to acid rain, salt (air & road), high winds, lightning, flooding, extended UV exposure, etc.;
- Chemical “off-gassing” from materials used in the construction of your recreational vehicle;
- Exterior paint or finish, which is warranted separately by the paint material manufacturer and outside application provider.
- Electrical issues resulting from unprotected shore power hook-ups, power surges, lightning, circuit overload or modifications;
- Damage caused by rodents or other animals and/or insects;
- Damage or loss to the recreational vehicle caused in whole or in part by tow vehicle, owner’s operation use or misuse of the tow vehicle, the hitch system (sway bars & equalizers), or brake control systems;
- Any and all damage or loss to the owner’s tow vehicle, including willful or negligent acts of the driver or accidents involving the recreational vehicle;
- Representations made by any person (including your dealer) beyond those stated in this Limited Warranty;
- Incidental and consequential damages including transportation, fuel, food, lodging, on-site service calls, etc.

***LIMITATION OF IMPLIED WARRANTIES:***

**IMPLIED WARRANTIES ARISING UNDER APPLICABLE STATE LAWS, IF ANY, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED TO THE EXTENT ALLOWABLE BY LAW, OR LIMITED IN DURATION TO THE TERM OF THIS LIMITED WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.**

*Owner Responsibility:*

The owner is responsible for normal maintenance, which is not covered under this Limited Warranty; provided, however, minor adjustments (such as adjustments to the interior or exterior doors, LP regulator pressure, cabinet latches, TV antenna control, voids in sealants, slide room adjustments and seals, etc.) will be performed by the dealer during the first (90) days of the warranty coverage. Thereafter, such adjustments are the responsibility of the owner as normal maintenance, unless required as a direct result of repair or replacement of a defective part under this Limited Warranty. It is the responsibility of the owner to maintain the recreational vehicle as described in 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 intrusion 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, and furniture, cabinetry or floor deterioration. Mold is a natural growth given certain environmental conditions and is not covered by the terms of this Limited Warranty. Owner must read the Owner's Manual and the corresponding component information and warranty package.

*Dealer Responsibility:*

The dealer is responsible to:

- Orient and familiarize the customer with the operation of all systems and components of the new recreational vehicle.
- Explain and review the Owner's Manual and the Limited Warranty provisions to the customer, and document this action on the Product Delivery Inspection (PDI) form.
- Assist the customer in completing all necessary registrations and warranty cards for your new recreational vehicle and assist in locating serial numbers.
- Instruct the customer on how to receive local and in transit service on the recreational vehicle and its separately warranted components, whether in or out of warranty.
- Complete the warranty registrations and return them to the proper entity within (30) days from the date of retail delivery.

*Dutchmen's Responsibility:*

Please note that the distinction between "defects" and "damage" as used in this Limited Warranty: subject to the other terms of this Limited Warranty, "defects" are covered because Dutchmen is responsible; 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 that occurs after the recreational vehicle is delivered is not covered under the Limited Warranty. Maintenance services are also excluded from this Limited Warranty because it is the owner's responsibility to maintain the recreational vehicle.

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

*How To Obtain Warranty Service:*

To obtain warranty service the owner must deliver the recreational vehicle to an authorized Dutchmen dealer within a reasonable time after discovery of the defect within the warranty period. Upon requesting the warranty services be prepared to be asked for:

1. Your name
2. Date of purchase
3. Dutchmen vehicle ID number
4. An explanation of the anticipated warranty claim

If the dealer is unable to resolve any warrantable issues or for assistance in arranging repairs, please contact:

Customer Service Department  
Dutchmen Manufacturing, Inc.  
(574)537-0700  
Fax: (574)537-0496  
E-mail: warranty@dutchmen.com

Upon receipt of notice of a claim, where the dealer was unable or unwilling to resolve the problem, either an alternate dealer or the manufacturing plant or factory service facility will take action pursuant to this Limited Warranty.

*Appliance and Component Warranty Service/Administration:*

Appliance and component manufacturers may or may not provide their own warranties. These warranties are separate from the Limited Warranty, and constitute the only warranty for those specific appliances and components. The terms, conditions and warranty periods of these items may vary from this Limited Warranty. For the appliance and component manufacturers providing warranties, Dutchmen may, however, administer those warranties during the terms of this one year Limited Warranty except for tires, batteries, audio visual electronic components, microwaves, convection ovens, and generators. All warranty service claims on appliances and other components can therefore be directed to Dutchmen during the duration of this Limited Warranty. After the one year period, all appliance component warranty claims must be directed to the respective appliance and component manufacturers. Dutchmen does not warrant any appliance or components and is only representing that it is authorized to administer the services for such products. In no way shall this Limited Warranty be modified or amended due to Dutchmen providing services for appliances and components.

*Disclaimer of Incidental and Consequential Damages:*

**Dutchmen hereby disclaims any and all incidental and consequential damages arising out of or relating to your Dutchmen recreational vehicle, including but not limited to transportation to and from vehicle dealerships and Dutchmen repair facilities, loss of time, loss of income, loss of use, inconvenience or aggravation, commercial loss (including lost profits), towing charges, bus fares, vehicle rental, service call charges, gasoline expenses, lodging expenses, damage to tow vehicle, and incidental charges such as telephone calls, facsimile transmissions, and mailing expenses. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.**

*Statue of Limitations:*

No action may be brought against Dutchmen for breach of this Limited Warranty, any applicable implied warranty, or for any other claim relating to the recreational vehicle more than one (1) year after the expiration of the one (1) year term of this Limited Warranty.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. PLEASE CONSULT YOU STATE FOR INFORMATION ABOUT THESE RIGHTS.

### **Inspection**

To assist you in avoiding problems, Dutchmen requests that each dealer review the limited warranty and inspect the unit along with you. The dealer has been provided with a pre-delivery checklist that should have been reviewed with you. In addition, you should have received an extensive walk-through of your RV. You should have been informed of the warranty, operation and maintenance of your trailer and its components, and the details of the responsibilities of the manufacturer, dealer and owner.

Your trailer has been inspected by the factory, and received a final inspection at the dealership, and then by you during the walk-through and demonstration. Please allow your dealership the opportunity to assist you in taking care of any warrantable problems that may have been discovered.

### **Owner Warranty Registration**

The owner registration form must be completed at the dealership at the time of delivery. After an owner signs this form, the dealer will send the completed form to Dutchmen within 10 days. You should have completed and signed this form before you left the dealership. If you ever move, change your address, or sell your RV, please complete and mail the Change of Address form located in the Glossary section. Just fill in the new information and mail it to Dutchmen.

### **Get to Know Your Trailer**

You will have a chance to use the systems and components in your trailer and see how they work. You will learn what items are needed when you go on your first real trip. Write down any questions that arise, difficulties or problems that occur. After your trial, call your dealer and ask any questions that you might have. Getting to know your trailer before the first adventure can save a lot of frustration and leave more time for fun!

### **Component Equipment and Appliance Manufacturer's Warranty Contacts**

Component manufacturer contact information can be found in the Glossary section of this manual.

## 4. Indoor Air Quality

### Introduction

Good indoor air quality is essential for long term enjoyment of your Dutchmen recreation vehicle. To maintain good air quality you need to be attentive to proper ventilation of your recreation vehicle, keeping the RV clean, and avoiding unnecessary air pollutants. Common indoor air pollution sources include molds, pollen, dander from pet fur, secondhand smoke, carbon monoxide from burning propane and other fuels (and charcoal), and household cleaners. Inadequate ventilation can increase indoor pollutant levels by not bringing enough outdoor air to dilute emissions from indoor sources and by not carrying indoor air pollutants outside. High temperatures and humidity levels can also increase concentrations of some air pollutants. Those people most at risk for poor indoor air quality include: people with asthma, people with allergies, people who have chronic lung diseases such as bronchitis and emphysema, people with pre-existing heart disease, children, and the elderly.

### Improving Indoor Air Quality

CDC Recommendations: The Centers for Disease Control and Prevention (CDC) recommends the following steps to improve indoor air quality:

1. Breath Fresh Air
  - Open Windows
  - Spend as much time outside as you can, in fresh air
2. Control Mold
  - Clean your bathroom and kitchen often to fight mold
  - Fix any water leaks
  - Clean up any mold you see or smell with a mix of no more that 1 cup of bleach mixed with 1 gallon of water. Never mix bleach with ammonia
  - Close windows and run your air conditioner (AC) or your dehumidifier to help control mold
3. Other ways to improve air quality
  - Clean often to get rid of dust and pet fur which can irritate your nose and throat

- Try not to use bug spray inside your trailer
- DO NOT SMOKE INSIDE YOUR TRAILER

### EPA Recommendations

There are three basic strategies recommended by the Environmental Protection Agency (EPA) to improve indoor air quality:

- Remove Sources: The most effective way to improve indoor air quality is to eliminate sources of pollution or reduce their emissions. Pollutants that this strategy can have an impact upon are: (i) Biological Contaminants such as bacteria, molds, mildew, viruses, animal dander, and pollen, (ii) Household Products such as paints, varnishes, cleaning and disinfecting solutions, cosmetics and hobby products, and (iii) Pesticides.
- Ventilation: To reduce or lessen exposure to chemicals from off-gassing it is of utmost importance that you ventilate your recreational vehicle. Ventilation should occur frequently after purchase and at times when the temperatures and humidity are elevated. Remember off-gassing is accelerated by heat and humidity. Open windows, exhaust vents, and doors. Operate ceiling and/or other fans, roof air conditioners, and furnaces and use a fan to force stale air out and bring fresh air in. Decreasing the flow of air by sealing the recreational vehicle increases the presence of indoor air pollutants. Please also follow the recommendations contained in this manual regarding tips to avoid condensation problems. Many of the recommendations contained in the manual will assist in avoiding exposure to chemicals that off-gas.
- Air Cleaners: Air cleaners are designed to remove particles from the air. There are many types and sizes of air cleaners on the market. However, air cleaners are not generally designed to remove gaseous pollutants. The effectiveness of an air cleaner depends on how well it collects pollutants from indoor air and how much air it draws through the cleaning or filtering element.

For more information about Indoor Air Quality and its effects, please refer to [www.epa.gov/iaq](http://www.epa.gov/iaq).

### **Chemical Sensitivity**

After you first purchase your new recreational vehicle and sometimes after it has been closed up for an extended period of time you may notice a strong odor and chemical sensitivity. This is not a defect in your recreational vehicle. Like your home, there are many different products used in the construction of recreational vehicles such as carpet, linoleum, plywood, insulation, upholstery, etc. Formaldehyde is also the by-product of combustion and numerous household products, such as some paints, coatings and cosmetics. However, recreational vehicles are much smaller than your home and therefore the exchange of air inside a recreational vehicle is less than a home. These products, when new or when exposed to elevated temperatures and/or humidity may “off-gas” different chemicals, including formaldehyde. This off-gassing, in combination with the minimal air exchange, may cause you to experience irritation of the eyes, nose, and throat and sometimes headache, nausea, and a variety of asthma-like symptoms. Elderly persons and young children, as well as anyone with a history of asthma, allergies or lung problems, may be more susceptible to the effects of off-gassing.

### **Formaldehyde**

Most of the attention regarding chemical off-gassing surrounds formaldehyde. Formaldehyde is a naturally occurring substance. It is also a key industrial chemical used in the manufacture of the numerous consumer products which we referred to above and used in the construction of recreational vehicles. Trace levels of formaldehyde are also released from smoking, cooking, use of soaps and detergents such as carpet shampoos, cosmetics, and many other household products. Some people are very sensitive to formaldehyde while others may not have any reaction to the same levels of formaldehyde. Amounts released decrease over time.

### **Do Not Smoke**

Finally, we recommend that you do not smoke inside your recreation vehicle. In addition to causing damage to your recreation vehicle, tobacco smoke releases formaldehyde and other air pollutants.

### **Medical Advice**

If you have any questions regarding the health effects of formaldehyde or any other air pollutants, please consult your doctor or local health department.

### **California Air Resource Board (CARB) Notice**

Formaldehyde is used widely in building materials such as pressed wood products, particleboard, hardwood plywood paneling, medium density fiberboard (MDF), and plywood which are commonly used throughout the Recreational Vehicle Industry. As mandated by the RV Industry, Dutchmen recreation vehicles contain composite wood products (hardwood plywood, particle board, and MDF) that comply with the California Air Resource Board (CARB) [Phase 1] formaldehyde emission standards under California Code of Regulations § 93120.2(a).

### **Warranty Exclusion**

**CHEMICAL OFF-GASSING IS NOT A “DEFECT” IN YOUR RECREATIONAL VEHICLE AND IS NOT COVERED BY THE LIMITED ONE-YEAR WARRANTY. PLEASE FOLLOW THE RECOMMENDATIONS IN THIS SECTION TO ADDRESS THIS CONCERN.**

### **Effects of Prolonged Occupancy**

Your trailer was designed primarily for recreational use and short-term occupancy. If you expect to occupy your trailer for an extended period, be prepared to deal with condensation and the humid conditions that may be encountered. The relatively small volume and tight compact construction of modern recreational vehicles mean that the normal living activities of even a few occupants will lead to rapid moisture saturation of the air contained in the trailer and the appearance of visible moisture, especially in cold weather.

Just as moisture collects 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 can 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 frost or ice. It may also condense out of sight within the walls or the ceiling where it will manifest itself as warped or stained panels. Appearance of these conditions may indicate a serious condensation problem. When using

your trailer, you should at all times take necessary action to minimize the effects of excessive moisture and condensation. For tips on controlling condensation see the “Tips to Controlling Condensation” section.

## NOTE

*Your trailer is not designed, nor intended, for 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 is not considered normal, and may under the terms of warranty, constitute misuse, abuse or neglect, and therefore void certain warranty protections.*

### Tips to Controlling Condensation

To avoid condensation problems, try to follow these tips to help alleviate excess moisture.

- Allow excess moisture to escape to the outside when bathing, washing dishes, hair drying, laundering, and using appliances and non-vented gas burners.
- Keep the bathroom door closed and the vent open (if equipped, exhaust fan on) when bathing/showering and for a period of time after you have finished.
- When cooking, always operate the range hood power vent. Cooking releases heat and moisture that can quickly result in condensation in your R.V.; operating the range vent can be effective in removing both.
- Do not hang wet clothes in the coach to dry.
- In hot weather, start the air conditioner early as it removes excess humidity from the air while lowering the temperature.
- Manage the inside temperature during cold weather. The higher inside temperature along with colder outside temperatures will cause condensation to form on areas that are not insulated as well as others (windows, vents, wall studs, etc).
- Use a fan to keep air circulating inside the vehicle so condensation and mildew cannot form in dead air spaces. Allow air to circulate inside closets and cabinets (leave doors partially open) so the temperature inside the cabinet is the same as in the rest of the unit. Please keep in mind that a closed cabinet full of stored goods prevents circulation and can cause condensation.

- The natural tendency would be to close the vehicle tightly during cold weather. This will actually compound the problem. Simply put, you need to get the moisture in the air that is created from normal use outside. The most effective way is utilizing your vents and vent fans.
- Use fluorescent ceiling lights and minimize prolonged use of incandescent lights, which produce heat and contribute to condensation in the roof above the ceiling lights.

If the tips presented here are not effective in controlling condensation, it may be necessary for you to invest in a dehumidifier to reduce the health risk to you or your family as well as prevent damage to your RV.

### Where There is Moisture, There May Be Mold

Molds are microscopic organisms that naturally occur in virtually every environment, indoors and out. Outdoors, mold growth is important in the decomposition of plants. Left unchecked, molds break down natural materials such as wood products and fabrics. According to the Center for Disease Control, exposure to damp and moldy environments may cause a variety of health defects, or none at all. Some people are sensitive to molds. For these people, molds can cause nasal stuffiness, throat irritation, coughing or wheezing, eye irritation, or, in some cases, skin irritation. People with mold allergies may have more severe reactions. Immune-compromised people and those with chronic lung illnesses, such as obstructive lung disease, may get serious infections in their lungs when they are exposed to mold.

For mold growth to occur temperatures must be between 40 degrees and 100 degrees Fahrenheit and there must be a source of moisture such as humidity, standing water, damp materials, etc. Indoors, the most rapid growth occurs with warm and humid conditions.

By controlling relative humidity, the growth of mold and mildew can be inhibited. In warm climates, use of the air conditioner will reduce the relative humidity. Vents are located in the bathing and cooking areas and constant use is advised during food preparation and bathing, even during colder weather. Additionally, opening a window during these activities will assist in ventilation. In extremely humid conditions, the use of a dehumidifier can be helpful.

*If using a dehumidifier, please read and follow all manufacturer instructions and recommendations to the use and cleaning of the dehumidifier.*

Frequent use of your RV or cleaning regularly is an important preventative measure. Further, any spills should be wiped up quickly and dried as soon as possible. Avoid leaving damp items lying about. On safe surfaces, use mold or mildew killing cleaning products. Check sealants regularly, and reseal when necessary to avoid water leaks. Proper preventative maintenance to the RV and its accessories, as described both in this manual and in accompanying literature, will provide the best protection to the RV.

For more information of controlling moisture in the RV, please read “Tips to Controlling Condensation” located in this manual.

### **Websites of Interest**

We also recommend that you visit the following websites which maintain information about indoor air pollutants, including molds and formaldehyde, along with ways to improve indoor air quality:

- <http://www.epa.gov/iaq/pubs/insidest.html>
- <http://www.atsdr.cdc.gov/tfacts111.html>
- <http://www.epa.gov/iaq/molds/moldguide.html>  
(Applies to controlling mold in the home, but the same recommendations would apply to trailers)
- <http://www.formaldehyde.org/>(Formaldehyde Council’s Website)
- <http://rvia.org/>(Recreational Vehicle Industry Association’s Website – Under the Technical Information & Training tab, click on Facts about Formaldehyde)

## 5. Tow Vehicle & Equipment

There are some other important things you should know about towing your trailer.

Towing a trailer will subject you to new and different challenges on the highway than you may have ever experienced before. An accident with a tow vehicle and trailer can have much greater consequences than carelessness with a small car. Take your responsibilities as a tow vehicle driver very seriously. Learn all you can about doing the job safely and well. Balancing the load and preparing the trailer and tow vehicle are critical to safe handling.

The combined weight of your trailer and tow vehicle must never exceed the Gross Combined Weight Rating (GCWR) as specified by the tow vehicle manufacturer. A load heavier than this limit could exceed the tow vehicle's ability to pull and stop the load, could damage the tow vehicle chassis structure or drive train, and possibly lead to a vehicle crash. Remember, you cannot increase the tow vehicle's towing capacity by changing the capacity of the hitch. Weights heavier than the limit can change your handling, could restrict your warranty coverage, and could possibly lead to a crash.

Remember that you must stop the trailer with the tow vehicle's brakes in combination with the brake controller and trailer brake system. This is extremely critical when driving in hills, mountains, sharply curving roads and irregular road surfaces.

Another critical aspect of safely operating a trailer is knowing the weights involved and where they are placed. You must determine that the load you intend to tow is within the capacities of the equipment you are using. The location of the load in the trailer is also critical to the way your rig will handle on the road.

There are some basic loading and towing rules that you must follow for safe towing. If a trailer doesn't tow properly when all the basic rules have been followed, the answer can be very complex. Swaying is usually caused by a trailer that is "tail heavy", and moving cargo to increase tongue weight will usually cure the problem. The moment your trailer shows any tendency to sway, you should slow down and determine the cause. Swaying can be a very complex problem because several components working together can cause it. Speed and wind are two of these components, so you should never

drive faster to try and eliminate swaying or any other problem.

You can't always correct a swaying problem by moving the trailer load forward if the tow vehicle isn't capable of handling the required hitch weight. Moving the load back in the trailer could make for a very unstable and dangerous condition. Too much weight on the hitch can also cause a dangerous situation where the tow vehicle doesn't have enough weight on the front wheels to keep the vehicles under control. When you hit the brakes, the trailer dives lifting the front of the tow vehicle even more, and you lose most of your braking and steering at the same time. Weight distribution hitches are available that can dramatically help your handling by spreading the forces to both axles, but they can not compensate for inadequate towing capacity or overloading.

### NOTICE

*In connection with the use and operation of Dutchmen recreational vehicles, Dutchmen customers and owners of Dutchmen recreational vehicles 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 Dutchmen products. Dutchmen further disclaims any liability with respect to damages which may be incurred by a customer or owner of Dutchmen recreational vehicles as a result of the operation, use or misuse of a tow vehicle.*

**Please note: Dutchmen's limited warranty does not cover damage to the recreational vehicle or the tow vehicle as a result of the operation, use or misuse of the tow vehicle.**

### Your Tow Vehicle

You likely already have the vehicle you will be using to tow and you may have based your trailer purchase on its capabilities. It is up to you to determine if your tow vehicle is really big enough to have the brakes and suspension it takes to safely tow your trailer. There isn't any good way to overcome a problem such as this short of obtaining a vehicle with more capacity. Adding bigger tires, more springs or better shocks will not help. If the suspension isn't heavy enough, the brakes are probably inadequate for the load you intend to tow. Just because a half-ton pickup may be able to carry 1000 pounds of weight in the bed, it probably cannot support 1000 pounds at the hitch without special modifications to

the suspension. There is a difference between “load” (actual weight applied) and “load rating” (maximum engineered design load limit). Gross Vehicle Weight Rating (GVWR) is determined by the manufacturer in the design of the vehicle. GVWR cannot be changed. The addition of heavier components does not change the legal GVWR of your vehicle. Any load exceeding these manufacturer’s rating values is both unsafe and illegal.

A basic rule of trailer towing is:

The tow vehicle and hitch must be capable of safely handling at least 15% of the gross weight of the trailer (total weight of trailer plus contents). Fifth wheel trailers usually have up to 25% of the gross weight on the hitch.

### Tow Vehicle And Trailer Brakes

You can’t have too much braking power. You should be able to stop your RV on a hill without the trailer brakes.

When learning, get on a vacant road without any traffic and try practicing panic stops. Of course, you shouldn’t just slam on your brakes. You should try to slowly shorten your stopping distance by applying more pressure. Don’t take it to the point that you lose control, just enough to get a feeling what it takes to make a quick stop and the distances involved. Don’t ride the brakes going down hills as this overheats brakes, causing them to lose effectiveness. Use the engine and lower gears to control the downhill speed on long hills. Learn how electric brakes work and how to adjust the controllers that actuate them. Remember that the slightest pressure to the brake pedal will apply the electric brakes. Keep your foot off the brake pedal unless you intend to use them.

### The Hitch

Before towing anything, have your hitch inspected by a qualified hitch installation company, and have them determine what the maximum tongue weight can be if it is not plainly marked on the hitch. Note that this is the hitch capacity, not the ball capacity. A ball is rated by its towing capacity. A hitch is rated by not only its towing capacity but also by the trailer tongue weight.



### NOTICE

*Be sure the tow vehicle is large enough for your trailer or fifth wheel, and has the needed power and heavy duty running gear. It must be rated by the vehicle manufacturer to tow the gross weight, and to carry the hitch weight of the fully loaded trailer or fifth wheel.*

### NOTICE

*Fifth-wheel hitch extenders (also called “gooseneck tongue adapters”) are not to be used with Dutchmen 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 may affect your warranty coverage under the Dutchmen Limited Warranty.*

### NOTE

*Heavy duty commercial vehicles larger than one ton may be used only if an energy absorbing hitch, such as the Air Ride Hitch™, is used to couple the trailer to the tow vehicle. The rough ride of the larger trucks can cause structural problems to develop in recreational trailers if an energy absorbing hitch is not utilized.*

### The Hitch, Ball and Safety Chains

The hitch pin plate or ball should be located so the trailer sits level when connected to the tow vehicle. The vehicle should be able to accept the loaded trailer tongue weight without a major change of attitude. The hitch pin plate or ball should be lightly greased so the pin box or coupler rotates smoothly on it. Safety chains

are required on all trailers except fifth wheels; they should be long enough for tight turns and be crossed under the ball (right to left and left to right). This will help keep the tongue off the road if the ball and coupler become disconnected and will help maintain control while stopping. Never allow the chains to drag on the pavement, because they can be ground to an unsafe condition very quickly. Always inspect the hitch and tongue for cracks when hooking up. Rust is your enemy and can cause premature failures. Check lights and brakes each time the trailer is hooked up. Try to do things in the same order each time and use a checklist. Don't forget to retract the tongue jack and stabilizer jacks. Don't ever hook a trailer up half way or you may forget to finish the job. Don't start if you can't finish, and never leave the receiver pin out for a minute, or forget to latch the pin and coupler.



### Equipment Selection and Preparation

For conventional travel trailers:

Use a weight distributing hitch rated for not less than the trailer Gross Vehicle Weight Rating and with spring bars rated not more than the ratings shown in the table below. 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. Do not add hitch extenders to the rear of your tow vehicle.



Use a sway control system installed and adjusted according to the sway control manufacturer's instructions. Refer to the hitch installation instructions for detailed preliminary ball mount adjustments.

### For fifth-wheel trailers:



Use a hitch and receiver assembly sized for the 2" SAE king pin and rated to pull not less than the Gross Vehicle Weight Rating 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.

**For all trailers:**



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. 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 your trailer is wider than your tow vehicle, you will need extended side view mirrors to see rear and side approaching traffic.

**State and Local Requirements For Towing**

States 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 require additional equipment for the tow vehicle, such as side and rear view mirrors. Inquire at your local motor vehicle administration office to find out what requirements affect you.

If you plan to travel in another state, don't forget to check their requirements and restrictions. There may be weight, height, and width limits for using certain roads, bridges, and tunnels. Be aware of restrictions regarding the transport of propane gas and other volatile gases or fuels in tunnels. Contact your insurance company to make sure you have the proper coverage.

## 6. Tires & Wheels

### The Importance of Proper Tire Inflation

#### **WARNING**

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

Your trailer tires and wheels, and tongue or fifth-wheel hitch support the entire weight of the trailer and its contents. The tires are also the only contact the trailer has with the road surface. Determining and maintaining proper inflation is the most important factor in maximizing the life of your tires. Driving on a tire that does not have the correct inflation pressure for the trailer load is dangerous and may cause premature wear, tire damage, tread delamination and/or loss of control of the trailer and/or tow vehicle.

An under-inflated tire will build up excessive heat that may go beyond the limits of the tire materials. This could result in sudden tire failure. An under-inflated tire will also cause poor vehicle handling, rapid and/or irregular tire wear, and an increase in rolling resistance which results in decreased tow vehicle fuel economy.

The maximum cold inflation pressure for your tires is stated on the tire sidewalls (see Page 33) and Federal certification label (see Page 32 and 37). Keep your tires inflated to this maximum cold pressure. This reduces the chance of a failure and improves towing stability. Maintaining correct tire inflation pressure for your trailer is of the utmost importance and must be a part of regular vehicle maintenance.

You must weigh your trailer when it is fully loaded as you expect to use it. You need to weigh all axles together and calculate the hitch weight. You may find that even though the total weight is within the GVWR, one side may be overloaded. For this reason, you must know the weight of each side of the trailer. When you know the weight on each side of the trailer, the combined axle assembly, and the hitch weight, you will be able

to manage your loading to be able to maintain good balance and assure safe handling on the road. Here are some tips to help you plan your loading:

- *Do not overload.* Experiment with various loads starting with light loads and working up to heavier loads. Take into consideration the load of the fresh water system. The tow vehicle and the terrain will affect the true weight you should carry.
- *Distribute the load evenly over the axles* as much as possible. Keep heavy items low and forward, preferably in the lower storage areas. This will produce a lower center of gravity, and improve road stability.
- *Distribute the load evenly on each side of the trailer.* Place heavier objects opposite the heavier appliances, cabinets, furniture, etc. when possible. Experiment with various load positions until you find the best distribution.
- *Avoid loading heavy items in or on the rear of the trailer.* This can cause both total weight problems and hitch weight distribution problems.
- *Secure items so they won't move* around while traveling. Make sure all items and materials are properly stored. Close and latch all drawers, cabinet doors, and closet doors. Pull all loose furniture away from cabinets and walls, and lay on their side or secure to prevent rubbing during travel.
- *Carry only as much water as you think you will need* while traveling. Water weighs over eight pounds per gallon. Whenever possible, empty the holding tanks before getting on the road.
- If you are heading for rough terrain, *use heavy packing material in the cupboards to hold plates, glasses, etc.* Put a nonskid material beneath heavier items to prevent shifting. Expensive and breakable belongings should be well packed and placed on the floor in the center of the trailer, as the center rides best.
- *Store emergency items* such as fire extinguisher, first aid kit, highway warning devices, gloves, etc. *in a readily accessible place.* Don't bury these items beneath other cargo.
- When you have properly loaded your trailer with the things you need for your trip, make a diagram that outlines where things are stored. With this diagram, your list of items and the weight of the items, you will be able to find specific items easily

and have a handy reference for determining proper weights.

- *Weigh your trailer after you have loaded it.* You may have to do this several times to get it right.

Check the trailer tires frequently. Tires can lose air over a period of time. In fact, tires can lose 1 to 3 PSI per month. This is because molecules of air, under pressure, migrate through the rubber from the inside to the outside. A drop in tire pressure could cause the tire to become overloaded, leading to excessive heat build up. If a trailer tire is under-inflated, even for a short period of time, the tire could suffer internal damage. A flat can go unnoticed on a multiple axle trailer while it is being towed. With multiple axles or tandem wheels it is hard sometimes to see a flat tire as the other tires are supporting the weight of the RV and the flat tire is less noticeable. A quick check can be made by “thumping” each tire with a tire iron or rod to make sure they all sound the same. Each time you gas up, walk around the trailer and give a quick check by feeling each tire with your hand. A tire that is getting low will be hotter than the rest. There is no substitute, however, for actually measuring tire pressures to make sure they are all within safe limits. Always check the cold tire inflation pressures before each trip and at least once a week during the trip for proper inflation levels.

The most common causes of tire failure are overloading and underinflation. Both result in excess flexing of the sidewall which causes heat buildup and eventual tire failure. Continuing to run with a flat can cause it to catch fire.

The most important things you can do to avoid tire failures are:

- maintain proper tire pressure;
- stay within tire and vehicle load limits;
- avoid road hazards if possible; and
- inspect tires for cuts, slashes, and other irregularities.

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

## NOTE

*The air pressure recommended on the tire information placard is for the original standard equipment tires only. Your trailer may be equipped with optional-sized tires. Always follow the pressure recommendations stamped in the tire sidewall for any replacement tire.*

### Understanding Tire Pressure and Load Limits

## CAUTION

*Tire load ratings are dependent on tire inflation pressures. Under-inflated tires can be damaged and result in a loss of inflation pressure.*

Tire inflation pressure is the level of air in the tire that provides it with load-carrying capacity and affects the overall performance of the vehicle. The tire inflation pressure is a number that indicates the amount of air pressure that a tire requires to be properly inflated. It is difficult to obtain the recommended tire pressure if your tires are not cold. Because tires are designed to be used on more than one type of vehicle, tire manufacturers list the “maximum permissible inflation pressure” on the tire sidewall. This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

### Checking and Adjusting Tire Pressure

It is important to check your vehicle’s tire pressure at least once a month, always before every trip, and at least once a week while on the road. Not only do tires naturally lose air over time, but they can lose air suddenly if you drive over a pothole or other object, or if you strike the curb. It is difficult to determine tire inflation pressure by looking at the tire. Purchase a tire pressure gauge to keep in your vehicle. Gauges can be purchased at tire dealerships, auto supply stores, and other retail outlets.



The recommended tire inflation pressure is the proper pressure when a tire is cold. 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.

Refer to the tire sidewalls for the recommended tire pressure. Your trailer may be equipped with optional tires.

Check and write down the pressure in all tires.

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.

If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. You will need to add air to get to the correct pressure.

Add air to each tire that is under-inflated.

Check all the tires again 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. Remember to recheck and adjust the pressure in all tires when you can obtain a cold reading.

### Tire Tread

The tire tread provides the gripping action and traction that prevents 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 treadwear indicators that let you know when it is time

to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear “even” with the outside of the tread, it is time to replace your tires.

### Tire Life

Trailer tires may be worn out even though they still have plenty of tread left. This is because trailer tires have to carry a lot of weight all the time, even when not in use. It is actually better for the tire to be rolling down the road than to be idle. During use, the tire releases lubricants that are beneficial to tire life. Using the trailer tires often also helps prevent flat spots from developing. The average life of a trailer tire is about five years under normal use and maintenance conditions. After five years, trailer tires may be degraded to the point that they should be replaced, even if they have had minimal or no use. Exposure to sunlight (ultra-violet damage) and high speed towing in hot conditions also reduces tire life. As heat builds up during driving, the tire’s internal structure starts to break down, compromising the strength of the tire. Have your tires inspected by a tire supplier to determine if your tires need to be replaced.

### Replacement Tires



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



*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.*

To maintain tire safety, purchase new tires that are the same type, size, construction and load rating as the original tires. Look at the tire information placard 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 Safety Information

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

The National Highway Traffic Safety Administration (NHTSA) has published a brochure (DOT HS 809 36) that discusses all aspects of Tire Safety, as required by CFR 575.6. It can be obtained and downloaded from NHTSA, free of charge, from the following web site:

[http://www.NHTSA.dot.gov/cars/rules/TireSafety/ridesonit/tires\\_index.html](http://www.NHTSA.dot.gov/cars/rules/TireSafety/ridesonit/tires_index.html)

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

These actions, along with other care and maintenance activities, can also improve vehicle handling, help protect you and others from avoidable breakdowns and accidents, improve fuel economy, and increase the life of your tires.

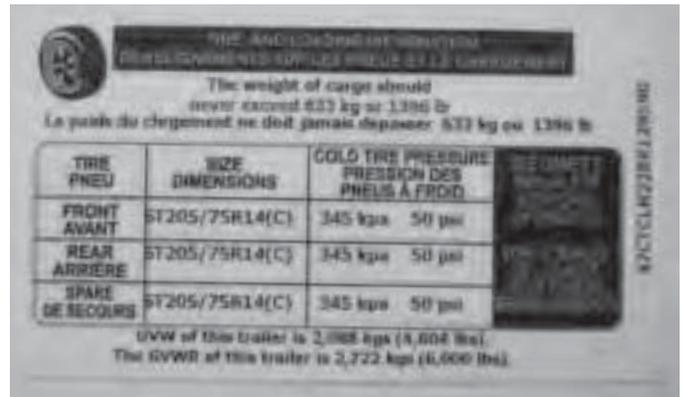
Use this information to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

### Basic Tire Maintenance

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

### Finding Your Vehicle's Recommended Tire Pressure And Load Limits

Tire information placards and vehicle certification labels contain information on tires and load limits. These labels indicate the vehicle manufacturer's information including: Recommended tire size, Recommended tire inflation pressure, Vehicle capacity weight (VCW—the maximum occupant and cargo weight a vehicle is designed to carry), Front and rear gross axle weight ratings (GAWR—the maximum weight the axle systems are designed to carry).



Both placards and certification labels are permanently attached to the trailer on the forward half of the left side, and are easily readable from outside the vehicle without moving any part of the vehicle.

### 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

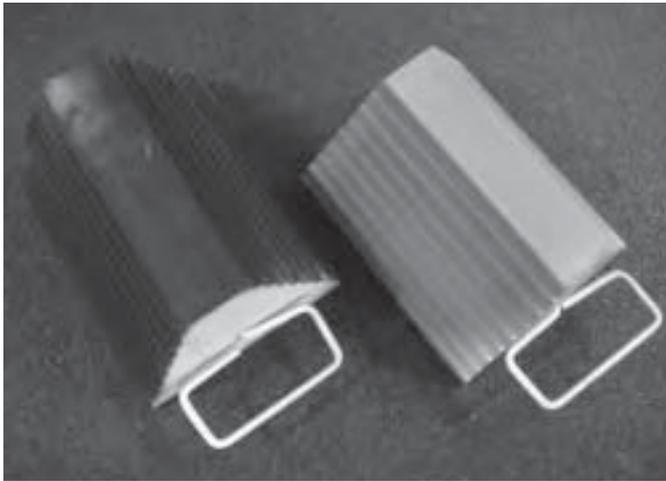
Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.



## Changing a Flat Tire

If you have a flat tire, Dutchmen recommends you call for road service. We do not suggest that you change a flat tire yourself. Road service providers will have the necessary tools to change your tire quickly and safely. There is no jack supplied with the trailer. If you **MUST** change a flat tire yourself:

1. Be sure the tow vehicle and trailer are completely out of any traffic lane, and on a solid ground or pavement surface. Do not attempt to change a flat tire on a soft, wet or uneven surface. Turn on the tow vehicle emergency flashers and set up flares or warning lights/signs.
2. Lower the spare tire to the ground and roll it near the flat tire. With the spare close to the flat, you can more quickly get the tire changed.



3. Place wheel chocks in front of and behind a tire diagonally opposite the flat to keep the trailer from rolling. If connected to the tow vehicle, place transmission in PARK, set the parking brake and loosen the hitch bars if applicable. Stop the tow vehicle engine. (For manual transmission, shift to reverse, stop engine, and set parking brake.)
4. Place a minimum 10-ton bottle jack or floor jack directly under the trailer frame near the flat tire on leaf spring axles and on the lip directly below the attachment point of the axle on torsion axles. Do not jack at any other point. Serious chassis damage can occur if other jacking points are used. Do not use a bumper jack.
5. Raise the jack enough to take some of the load, but not enough to raise the tire you are changing.



6. Loosen the wheel nuts on the flat tire.
7. Using the bottle jack, raise the trailer high enough to remove the flat tire. Remove the wheel nuts and remove the wheel and tire.
8. Place the spare tire on the axle and secure it with the wheel nuts. Tighten the nuts until the wheel is secure on the axle.
9. Lower the trailer to the ground. Tighten the wheel nuts in the sequence shown in the Wheel Nut Torquing Sequence illustrations later on in this chapter.
10. Place the removed wheel on the spare tire carrier, lift up and lock the carrier.

When attaching wheels:

1. Start all nuts by hand to prevent cross threading.
2. Tighten all nuts in the sequence shown, in three stages to the torque values shown in the Wheel Nut Torque Chart shown later on in this chapter.
3. Torque wheel nuts before the first road use and after each wheel removal. Check and recheck torque after the first 10 miles, 25 miles, and again at 50 miles. Check periodically thereafter. **STOP AT THE NEAREST SERVICE FACILITY AND HAVE THE TORQUE CHECKED.**

### **NOTE**

*Use a torque wrench to tighten wheel nuts. Do not tighten with an impact wrench unless using a torque stick. See the Wheel Nut Torque Chart later on in this chapter for correct wheel nut torque values.*

## Axles

### Double-Eye Leaf Suspension



### NOTICE

- *Carrying a jack rated for the weight of the coach is essential. The jack must be rated between 8 and 12 tons.*
- *To prevent damage to the coach, carry wood blocks to place between the jack and the main rail (I-beam) of the coach and to go under the jack.*
- *DO NOT jack the coach on the axle tube or black pipe gas lines that can sometimes be mounted to the bottom of the I-beam.*
- *Chock the wheels, both front and rear, on the opposite side of the coach.*
- *If hitched to tow vehicle, stay hitched and set the parking brake.*
- *DO NOT use the front landing gear or rear stabilizer jacks to pick the coach up to change a tire. This is dangerous and may result in serious bodily injury or death.*

### NOTICE

*Do not lift or support trailers equipped with a torsion axle suspension on any part of the frame or axle tube assembly. Lifting the trailer at the axle tube can cause permanent damage to the axle, which will not be covered under the warranty.*

### Vehicle Load Limits

Determining the load limits of a vehicle includes more than understanding the load limits of the tires alone. A Federal Certification Label is located on the forward

half of the left (road) side of the unit. The certification label indicates the vehicle's gross vehicle weight rating (GVWR). This is the most the fully loaded vehicle can weigh. It also provides the gross axle weight rating (GAWR). This is the maximum weight a particular axle can carry. If there are multiple axles, the GAWR of each axle is provided. In the same location as the certification label described above, there is a vehicle placard. This placard provides tire and loading information. In addition, this placard will show a statement regarding maximum cargo capacity.

### Cargo Capacities

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

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

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

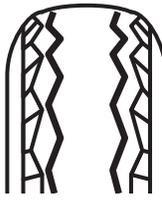
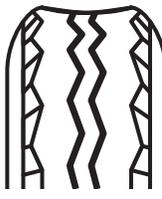
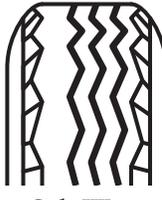
### How Overloading Affects Your RV And Tires

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

vehicle is hard to drive and hard to stop. In cases of serious overloading, brakes can fail completely, particularly on steep hills. The load a tire will carry safely is a combination of the size of tire, its load range, and corresponding inflation pressure. Excessive loads and/or 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. It is the air pressure that enables a tire to support the load, so proper inflation is critical. Since RVs can be configured and loaded in many ways, air pressures must be determined from actual loads (determined by weighing) and taken from the load and inflation tables provided by the tire manufacturer. These air pressures may differ from those found on the certification label. However, they should never exceed the tire limitation for load or air pressure. If you discover that your tires cannot support the actual weights, the load will need to be lightened.

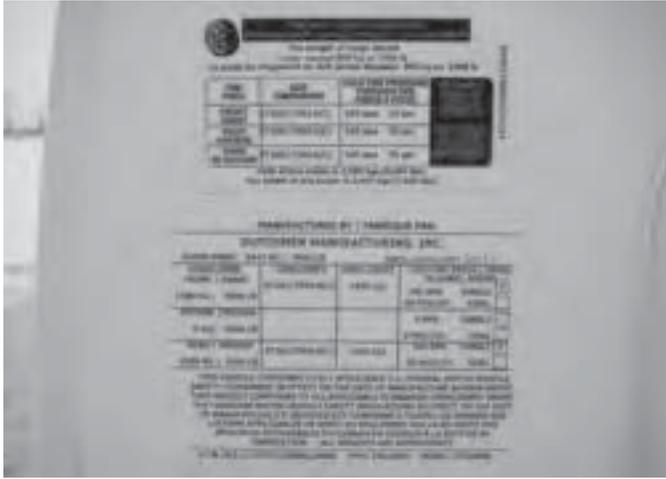
**Tire Safety Tips / Preventing Tire Damage**

- Slow down if you have to go over a pothole or other object in the road.
- Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.
- Check tire pressure (including the spare) at least once a month and before going on any trip
- Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma. The following tire wear diagnostic chart will help you pinpoint the causes and solutions of tire wear problems.
- Remove bits of glass and foreign objects wedged in the tread.
- Make sure your tire valves have valve caps.
- Do not overload your vehicle. Check the Tire Information and Loading Placard or User’s Manual for the maximum recommended load for the vehicle.

Wear Pattern	Probable Cause	Corrective Action
 <p>Center Wear</p>	Over-inflation	Adjust pressure to particular load per tire catalog
 <p>Edge Wear</p>	Under-inflation	Adjust the pressure to particular load per tire catalog
 <p>Side Wear</p>	Loss of camber or overloading	Make sure load doesn't exceed axle rating. Call your dealer to advise
 <p>Toe Wear</p>	Incorrect toe-in	Call your dealer to advise
 <p>Cupping</p>	Out of balance	Check bearing adjustment and balance tires
 <p>Flat Spots</p>	Wheel lockup and tire skidding	Avoid sudden stops if possible and adjust brakes

**Steps For Determining Correct Load Limit**

Locate the statement “The weight of cargo should never exceed XXX lbs” on your vehicle’s placard.



The figure stated on the placard is the available amount of cargo load capacity. The weight of all cargo loaded in the vehicle may not safely exceed this figure.

*Determine the weight of cargo being loaded in the vehicle. That weight may not safely exceed the available cargo capacity.*

Please refer to Chapter 7 for more information on loading and weighing.

For further information about wheel and tire safety:

1-888-327-4236 (TTY: 1-800-424-9 53)

<http://www.safercar.gov> and:

NHTSA  
400 Seventh St. S.W.  
Washington, DC 20590

### Glossary Of Tire and Weight Terminology

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

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

**Bead Separation** – This is the breakdown of the bond between components in the bed.

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

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

**Chunking** – The breaking away of pieces of the tread or sidewall.

**Cold Inflation Pressure** – The pressure in the tire before you drive.

**Cord** – The strands forming the plies in the tire.

**Cord Separation** – The parting of cords from adjacent rubber compounds.

**Cracking** – Any parting with the tread, sidewall, or inner liner of the tire extending to cord material.

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

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

**Extra Load Tire** – A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

**Groove** – The space between two adjacent tread ribs.

**Gross Vehicle Weight Rating (GVWR)** – The maximum permissible weight of this fully loaded travel trailer.

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

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

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

**Innerliner Separation** – The parting of the inner liner from the cord material in the carcass.

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

**Light Truck (LT) Tire** – A tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

**Load Rating** – The maximum load that a tire is rated to carry for a given inflation pressure.

**Maximum Permissible Inflation Pressure** – The maximum cold inflation pressure which a tire may be inflated.

**Maximum Loaded Vehicle Weight** – The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.

**Measuring Rim** – The rim on which a tire is fitted for physical dimension requirements.

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

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

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

**Non-Pneumatic Tire Assembly** – A non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

**Open Splice** – Any parting at any junction of tread, sidewall, or innerliner that extends to cord material.

**Outer Diameter** – The overall diameter of an inflated new tire.

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

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

**Ply** – A layer of rubber-coated parallel cords.

**Ply Separation** – A parting of rubber compound between adjacent plies.

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

**Production Options Weight** – The combined weight of those installed regular production options weighing over 23 kilograms (5 lbs.) in excess of those standard items which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

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

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

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

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

**Rim Diameter** – This means the nominal diameter of the bead seat.

**Rim Size Designation** – This means the rim diameter and width.

**Rim Type Designation** – This means the industry of manufacturer's designation for a rim by style or code.

**Rim Width** – This means the nominal distance between rim flanges.

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

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

**Sidewall Separation** – The parting of the rubber compound from the cord material in the sidewall.

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

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

**Tread Rib** – A tread section running circumferentially around a tire.

**Tread Separation** – Pulling away of the tread from the tire carcass.

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

**Vehicle Capacity Weight** – The rated cargo and luggage load plus 68 kilograms (150 lbs.) times the vehicle's designated seating capacity.

**Vehicle Maximum Load on the Tire** – The load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing it by two.

**Vehicle Normal Load on the Tire** – The load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I of CRF 49571.110) and dividing it by 2.

**Weather Side** – The surface area of the rim not covered by the inflated tire.

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

**Wheel-Holding Fixture** – The fixture used to hold the wheel and tire assembly securely during testing.

## Wheels And Wheel Nut Torque



### **! WARNING**

*Torque wheel nuts to the wheel manufacturer's specifications. Incorrectly torqued wheel nuts can cause the wheel to separate from the wheel mounting surface during operation, causing property damage, personal injury or death.*

### **! WARNING**

*Do not tow the trailer with missing wheel nuts or faulty lug bolts.*

### **! WARNING**

*WHEEL SEPARATION CAN OCCUR On first trip, torque wheel nuts at 10, 25 and 50 miles and before each trip. After winter storage, check wheel nut torque before beginning a trip. After excessive braking, check wheel nut torque.*

### **! WARNING**

*Installation of wheels which are not compatible with the manufacturer-installed axle assembly could result in wheel separation, which can lead to property damage, serious injuries or loss of life.*

### **! WARNING**

*Loose wheel 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.*

 **WARNING**

*Do not attempt to repair or modify a damaged wheel. Even minor modifications can cause a dangerous failure of the wheel and result in personal injury or death.*

 **WARNING**

*Under- or over-tightening of wheel nuts can cause the wheel to separate from the axle and could lead to property damage, serious injury or death.*

The axle and wheel assemblies of your RV are designed differently than those on your car or truck. The overall size, weight and center of gravity of a recreational vehicle subject the wheels to pressures unique to trailering. During normal cornering, the tires and wheels experience a considerable amount of stress called “side-load”. Trailer wheels must carry higher loads per wheel than passenger car or light truck wheels. The axles on multiple-axle trailers do not steer, and are subjected to very high side load stress whenever the trailer makes a tight turn. When you go around corners — especially tight ones — the wheels on your trailer are subjected to these strong side loads. This action tends to flex the wheel and gradually loosen the wheel nuts. Even though the materials and manufacturing processes are maximized for this type of service, the extra load stresses and flexing can cause loosening.

Proper wheel nut torque is very important to safe and dependable trailering. Although the wheel and axle systems used in your trailer are similar to those on your car or truck, they differ in several important ways. These differences require special attention to wheel nut torque both when the trailer is new and throughout the trailer’s life.

It is critical that the wheels be properly torqued during the first 10, 25 and 50 miles of operation. The wheels have been correctly torqued before leaving the factory. But settling and wearing in of components during the first few miles of operation may cause some loosening of the wheel nuts.

The wheel nut torque specification is shown on the Wheel Nut Torque Table at the end of this chapter. The values are different depending on the type of wheel installed. Always use an accurate torque wrench to tighten the wheel nuts. Before each trip and any time a wheel is replaced, be sure to tighten the wheel nuts as outlined in the following section. If a wheel is replaced,

check the torque again after 10, 25 and 50 miles. If you ever notice wheel wobbling or hear a rattling sound coming from a wheel, especially at low speeds, a wheel nut may have come loose. If you have reason to believe a wheel nut has come loose, safely stop at the side of the road as soon as possible. Check all wheel nuts, and tighten to the specified torque. If wheel stud bolt threads are damaged or faulty, get professional service help. Do not tow the trailer with missing wheel nuts or faulty wheel stud bolts.

If you ever have to replace lost or damaged wheel nuts, be sure the replacements match the cone angle of the originals.

### **Wheel Nut Torque Requirements and Maintenance**

#### **Tools Required: Dial indicator or adjustable dial torque wrench**

7/8” or 13/16” socket DO NOT USE a 4-way socket or any other type of wrench, which does not measure the actual pressure applied to the wheel nut.

Please refer to the torque wrench manufacturer’s instructions for information on correct use, storage and maintenance of your torque wrench.

#### **Remember:**

Check wheel nut torque before every trip. Dutchmen recommends this maintenance procedure to ensure proper torque has been applied to wheel nuts before heading out on the road.

Always follow the appropriate tightening sequence (“star pattern”) as indicated in these instructions or in your axle manufacturer’s owner’s manual to assure proper torque.

Torque wheel nuts in the correct stages and follow-up intervals after any wheel reinstallation. For further information on these steps, you may want to refer to the axle manufacturer’s owner’s manual in your Owner’s Information Packet. Proper torque of wheel nuts can only be achieved by using a torque wrench and a socket.

### Setting Torque Value on a Dial Indicator Wrench



1. Make sure your indicator needle is set to "0".
2. As you apply clockwise pressure to the wheel nut, both needles will show the current amount of torque being applied.
3. When you reach your desired torque value, stop applying pressure and your indicator needle will stay at the highest torque value reached.

### Setting Torque Value on Adjustable Dial Wrench

1. Unlock the handle and set the dial to your desired torque value.
2. Lock the handle back in place.
3. As you apply clockwise pressure to the wheel nut, you will hear an audible "click" when the desired torque wrench value is reached. Do not apply further pressure once you hear the "click".

### Pre-Trip Torquing Procedure

1. Set your torque wrench to the final value listed in the Wheel Nut Torque Table at the end of this chapter.
2. Begin with the appropriate bolt for your wheel (12 o'clock position for 8 and 6 hole wheels and 2 o'clock position for 5 hole wheels, as illustrated) and apply torque to all wheel nuts following the star pattern indicated.
3. Complete the procedure on each wheel. Before moving to each new wheel, be sure to verify your preset torque wrench value.

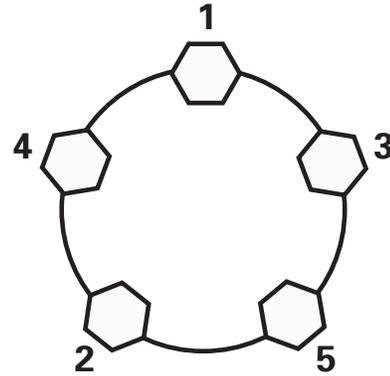
### Torquing After Wheel Reinstallation

After removing a wheel from your RV for any reason, you must carefully follow a 2-step process:

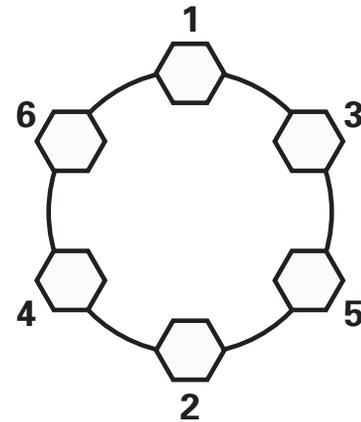
NOTE: Use a torque wrench to tighten wheel nuts. Do not tighten with an impact wrench unless using a torque stick.

NOTE: The maximum torque value for the wheel mounting studs is 120 ft.lbs. Studs are Grade 8, 1/2"-20 UNF, Class 2A.

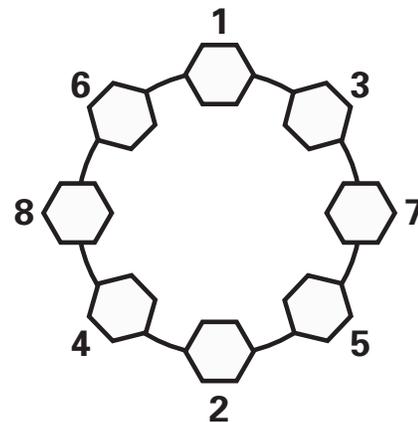
### Wheel Nut Torquing Sequence



*5-Lug Bolt Pattern*



*6-Lug Bolt Pattern*



*8-Lug Bolt Pattern*

**Wheel Nut Torque Chart**

Wheel Size	Stud Size	Torque Sequence		
		1st Stage	2nd Stage	3rd Stage
14"	½"	20-25 ft./lb.	50-60 ft./lb.	90-120 ft./lb.
15"	½"	20-25 ft./lb.	50-60 ft./lb.	90-120 ft./lb.
16"	½"	20-25 ft./lb.	50-60 ft./lb.	90-120 ft./lb.
16.5" x 6.75"	½"	20-25 ft./lb.	50-60 ft./lb.	90-120 ft./lb.
16"	⅝"	20-25 ft./lb.	60-70 ft./lb.	120-130 ft./lb.
16.5" x 6.75"	⅝"	20-25 ft./lb.	60-70 ft./lb.	120-130 ft./lb.
17.5" w/ long nut	⅝"	50-60 ft./lb.	100-120 ft./lb.	190-210 ft./lb.
17.5" w/ flange nut	⅝"	50-60 ft./lb.	150-200 ft./lb.	275-325 ft./lb.
14.5" Demount	½"	Tighten sequentially to 85-95 ft./lb.		

**Wheel Reinstallation**

When you reinstall a wheel, the wheel nut torque must be applied in 3 stages. This will ensure the wheel studs are centered in the wheel holes, and will help the wheel nuts maintain proper torque.

*Stage 1*

Start all wheel nuts by hand.

Set your torque wrench to the 1st Stage value on the Wheel Nut Torque Table.

Begin with the appropriate bolt for your wheel (12 o'clock position for 8 and 6 hole wheels and 2 o'clock position for 5 hole wheels) and apply torque to all wheel nuts following the star pattern as shown in the Wheel Nut Torquing Sequence illustration.

*Stage 2*

Increase your torque wrench setting to the 2nd Stage value on the Wheel Nut Torque Table.

Begin with the appropriate bolt for your wheel and apply torque to all wheel nuts following the star pattern. Following Stage 2, the wheel can support the weight of the trailer and can be lowered off of the jack stands.

*Stage 3*

Increase your torque wrench setting to Final Torque value on the Wheel Nut Torque Table.

Begin with the appropriate bolt for your wheel and apply torque to all wheel nuts following the star pattern.

*Follow-Up: Re-torque after 10, 25, and 50 miles*

1. After the first 10 miles of your trip, pull your recreation vehicle off the road into a safe work area.
2. Set your torque wrench to the Final Torque value on the Wheel Nut Torque Table for your wheels.
3. Begin with the appropriate bolt for your wheels and apply torque to all lug nuts following the star pattern.
4. Reapply torque (at the Final Torque value for your wheels) and repeat steps 1, 2, & 3 again at 25 miles and at 50 miles of your first trip.
5. The follow up process is complete and you should refer to the general lug nut torque maintenance process described in "Pre-Trip Torquing Procedure".

**Replacement Wheel Requirements**

Dutchmen installs axle systems with hubs and drums that are compatible with many wheels used in the recreational travel trailer industry that have similar or matching bolt patterns. If the original manufacturer-installed equipment must be replaced, contact the replacement wheel manufacturer to ensure compatibility prior to replacement and use.

Customers replacing original equipment must ensure the replacements are compatible with the hub and drum assembly installed. This compatibility includes, but is not limited to:

- Diameter of the hub-mounting surface
- Stud length and diameter
- Location and number of studs – Many bolt circle dimensions are available. Some vary by so little that it might be possible to attach an improper wheel

that does not match the axle hub. Be sure to match your wheel to the axle hub.

- Center hole diameter for the wheel
- Wheel mounting offset from the rim center
- Rated capacity of the wheel – Make sure that the wheels have enough load carrying capacity and pressure rating to match the rated load of the tires.
- Offset – This is the relationship of the center line of the tire to the hub face of the axle. Take care to match any replacement wheel with the same offset wheel as originally equipped. Failure to match offset can result in reducing the load carrying capacity of your axle.
- Wheel fastener torque
- Wheel nut size and shape (including cone angle)
- The effects of any added wheel accessories that could affect proper seating of the wheel to hub surface.

### NOTE

*The maximum air pressure rating stated on the tire information placard is for the original equipment, factory-installed tires only. Always follow the pressure recommendations stamped in the tire sidewall for any replacement tire.*

Certain tests are recommended by the manufacturers of factory-installed equipment for all wheels and rims to be installed in place of original factory equipment. Contact the wheel manufacturer to verify compatibility with the factory installed equipment prior to replacement.

Keep record of the date and mileage when you check the wheel nut torque. Note any wheel nut that has lost torque. Investigate the reason(s) if the wheel nut torque is not maintained after more than one re-torquing. This indicates there is something wrong with the wheel nuts, nut studs, wheels and/or hubs and should be corrected.

If you ever experience a wheel separation incident, notify Dutchmen and your dealer. Seek prompt professional assistance in assessing the trailer and its components. Keep, but don't re-use the wheels, wheel nuts and studs involved. Don't repair or service the trailer yourself.

### ! WARNING

*Do not mismatch wheels and tires.*

### ! WARNING

*Do not paint or apply anti-seize or anti-rust materials to the hub mating surface of wheels. These materials prevent a secure metal-to-metal contact with the hub surface. Use of these materials may cause loosening of the wheel or wheel nuts, causing the wheel to separate from the axle, and may lead to property damage, serious injury or death.*

Any replacement wheel must be plain metal on the surface mating to the trailer hub. There should be no paint, clear coat material, anti-seize or anti-rust coating. These materials prevent a secure metal-to-metal contact with the hub. A secure metal-to-metal contact is required for safe and complete attachment of the wheel to the hub.

The same torquing considerations apply to replacement wheels as to original equipment. If you replace wheels, try to find out the torquing specifications for the replacement wheel. In all cases, do not torque wheel nuts greater than the value listed in the Wheel Nut Torque Table. This is the maximum specified torque for the wheel mounting studs. The studs conform to SAE standards for Grade 8.

## 7. Loading & Weighing

A very important part of safe trailer operation is proper loading. This guide will provide you with information about the proper way to load and weigh your trailer. We'll also discuss the relationship between loading, weighing and proper tire inflation, related chassis components, your tow vehicle and towing equipment. We have also provided some safe driving and towing guidelines. There are some very important terms and concepts about weights and loading that you must understand. Please study this section carefully and refer to it often as you prepare your trailer for travel.

Towing a trailer will present different challenges on the highway than you may have experienced before. You should always be careful and think safety first. An accident with a tow vehicle and trailer can have much greater consequences than just an automobile. Take your job as a tow vehicle driver very seriously. Learn all you can about performing the task safely. Balancing the load and preparing the trailer and tow vehicle are critical to safe handling.

A critical aspect of safely operating a trailer is knowing the weights involved and where they are placed. You must determine how much is being towed. You must assure that it is within the capacities of the equipment you are using. The location of the load in the trailer is critical to the way your RV will handle on the road.

There are some basic loading and towing rules that you must follow for safe towing. We will discuss some of the rules of safe trailering and how you can reduce the possibility of having serious towing problems like swaying or instability.

### **Chassis Weight Specifications And Limits**

The trailer chassis was designed to carry a specific maximum weight. That weight includes everything: the chassis components, the empty trailer body as completed at the factory, all of your cargo and belongings, fuel, fresh water, waste water, propane, and anything else that might be attached to or carried in the trailer. You must never exceed this maximum weight. If you exceed this weight, you will change the way your trailer and/or tow vehicle handles. Tires and suspension components may be overloaded. This may lead to unsafe conditions, loss of control, and the loss of your trailer and/or tow vehicle.

Chassis weight specifications include terms that require some explanation. As we discuss loading and weighing, we'll refer to these terms. The following include definitions used by the recreational vehicle industry:

### **GVWR (Gross Vehicle Weight Rating)**

The maximum permissible weight of the fully loaded trailer. It is the absolute total allowable weight on the wheels and tongue. This is the limit of the specified axles and tongue components as engineered by the trailer manufacturer. It represents the manufacturer's maximum loaded weight that the trailer is designed to carry. The GVWR has been determined by weighing a sample of units with the hitch weight added to the sum of the GAWR's (Gross Axle Weight Ratings).

### **UVW (Unloaded Vehicle Weight)**

The weight of the trailer as manufactured at the factory. The UVW does not include cargo, fresh water, propane, customer installed options, or dealer installed accessories. UVW also includes all weight at the axles and coupler. If applicable, it also includes full generator fluids, including generator engine fuel, engine oil, and coolants. The UVW of the trailer is noted on the trailer weight placard.

### **GCWR (Gross Combined Weight Rating)**

The total combined maximum weight specified by the tow vehicle manufacturer. It is the total weight that the tow vehicle is designed to tow and stop.

### **CCC (Cargo Carrying Capacity)**

The maximum weight of all personal belongings: food, tools, dealer installed accessories, etc. that can be carried by your trailer. CCC is equal to GVWR minus each of the following: UVW, full fresh (potable) water weight (including water heater), and full propane gas weight.

### **GAWR (Gross Axle Weight Rating)**

This means the maximum permissible loaded weight a specific axle is designed to carry when being towed. Each axle has its own GAWR. The GAWR is prescribed by the axle manufacturer for each axle. It is the lowest rated component of the axle system, including wheels and tires. The total GAWR for the trailer is GAWR per axle times the number of axles.

**GTW (Gross Towed Weight)**

The maximum permissible loaded weight of any towed load (trailer, car, etc.) that your tow vehicle has been designed to tow, as specified by the tow vehicle manufacturer. You cannot increase this weight by changing the trailer hitch on the tow vehicle.

**Maximum Tire Load**

The maximum amount of weight a tire is designed to carry when the tire is inflated according to the tire manufacturer's specifications.

You may see other weight terms and definitions in publications such as sales literature, magazines, books or on-line. Many of these terms are interchangeable and may require some interpretation and conversion to avoid confusion. The following are several of those other terms, what they mean and how you can translate between them.

**Dry Weight**

The weight of the trailer as it comes out of the factory with no fluids - completely empty and dry. This is the weight of the trailer as built with all standard features, and includes options normally added to the trailer by Dutchmen. DRY WEIGHT does not include accessories or components added by the dealer or the owner. It does not include any gasoline for the generator (if equipped), gasoline for the fuel station (if equipped), water, propane or other CARGO. CARGO is anything loaded in or on the trailer. Subtract DRY WEIGHT from GVWR to get PAYLOAD CAPACITY. This figure represents the maximum amount of gasoline fuel, water, propane and other cargo which can be added to, loaded in or loaded on the trailer. PAYLOAD is anything added to the factory-bare trailer.

Example: If the specified payload capacity of the unit is 2200 lbs, and a dealer or owner adds accessories that weigh 600 lbs, the actual payload capacity or the amount that can safely be loaded in the trailer without overloading is now 1600 lbs.

The DRY WEIGHT of the trailer plus only the weight of generator and fuel station gasoline if the trailer is equipped with a fuel station, is equipped with a generator or can be equipped with a generator (manufactured as "generator-ready").

Subtract UVW, the weight of water and the weight of propane, from GVWR to get CCC (Cargo Carrying

Capacity). You will see references to CCC on weight certification tags or in other publications.

**Weight Definitions Summary**

- GVWR (Gross Vehicle Weight Rating): is the maximum permissible weight of a fully loaded recreational vehicle.
- GAWR (Gross Axle Weight Rating): is the maximum permissible weight the axle is rated to carry.
- UVW (Unloaded Vehicle Weight): is the total weight of the recreational vehicle as manufactured at the factory when separated from the tow vehicle.
- CCC (Cargo Carrying Capacity): is equal to the GVWR minus each of the following: UVW, full fresh (potable) water weight (including the water heater), full LP-Gas weight.
- GCWR (Gross Combined Weight Rating): means the maximum allowable loaded weight of the recreational vehicle with its tow vehicle. Actual GCWR may be limited by the sum of the GVWR and the installed hitch rated capacity.

**Cargo Carrying Capacity (CCC) Computation**

<i>Item</i>	<i>Pounds/Kilograms</i>
Gross Vehicle Weight Rating (GVWR)	
Minus Unloaded Vehicle Weight (UVW)	
Minus fresh water weight of _____ gallons at 8.3 lb/gal (3.8 kg/gal)	
Minus LP-Gas weight of _____ gallons at 4.5 lb/gal (2 kg/gal)	
<i>Equals Cargo Carrying Capacity (CCC) for this recreational vehicle</i>	

**Loading & Weight Distribution**

Proper loading and weight distribution is critical for safe operation and towing of your recreational vehicle. Be sure to have your fully loaded unit weighed at a certified scale to confirm you are operating safely within the recreational vehicle's limits. Always verify that you are operating under the GVWR, and that your load is

balanced side to side and front to back to assure you are within the rating limits of your hitch and tires. For tires, take the GVWR minus the tongue weight to determine the weight on the tires to make sure you are not exceeding the weight rating of the tires.

### Carrying Capacity

Although all the weight and load ratings and weight definitions are important, the one you will be concerned with on a daily basis is Cargo Carrying Capacity. If you fill all the tanks, compartments, cabinets and other storage spaces, the trailer will probably be overloaded. Always remember that the storage compartments and facilities have been designed and positioned for convenience. Carefully plan your loading and the items you load. Be aware of the weight of everything you load. Take all you need, but no more than you need.

Carefully plan how to distribute the items you carry so you can load correct amounts of weight from front-to-rear and side-to-side. Properly distributing the weight will help you keep within the axle and individual tire and wheel weight limits. When you load properly, the trailer and your tow vehicle will handle and respond safely, and you and your passengers will be more comfortable and confident while on the road. If you load improperly, your trailer/tow vehicle may be unsafe and/or uncomfortable to drive, and your tires may be overloaded. If the vehicle is top heavy or too heavy on one side, it can be overturned in a curve or during an emergency steering maneuver. Proper weight distribution is very important to overall stability and towing characteristics. Poor weight distribution, especially in the rear of the trailer, can cause trailer swaying or handling instability. Always include the essential things you need, but **DON'T OVERLOAD**.

### How Overloading Affects Your Trailer

The results of overloading can have serious consequences for 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.

Overloading a trailer beyond its rated capacity, even though it may be well balanced and seem to handle fine, is a very dangerous practice. Eventually something

is bound to fail with dramatic and unpleasant results. Overloading places excess strain not only on your tow vehicle causing possible failures at the hitch or in your capacity to safely bring it to a stop in an emergency, it also overloads the trailer's frame, axles, bearings and tires.

Load your trailer well below the maximum for the first tow with a new RV or while you are learning. Keep track of the weights of the individual items as you load them. When in doubt guess high. Using a scale, adjust the load so that you have around 12% to 15% (15 to 25% for fifth-wheels) of your best estimated total weight on the hitch. Attach the trailer to the tow vehicle and note how much the rear end drops. If it looks excessive, check the tow vehicle's load capabilities.

### Cargo Capacities

The certification label attached to left front corner of the trailer body shows trailer and axle weight ratings, tire size and cold inflation pressures. The label indicates the vehicle's gross vehicle weight rating (GVWR). This is the most the fully loaded vehicle can safely weigh. It also states the gross axle weight rating (GAWR). This is the most a particular axle can safely weigh. If there are multiple axles, the GAWR of each axle is stated.

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

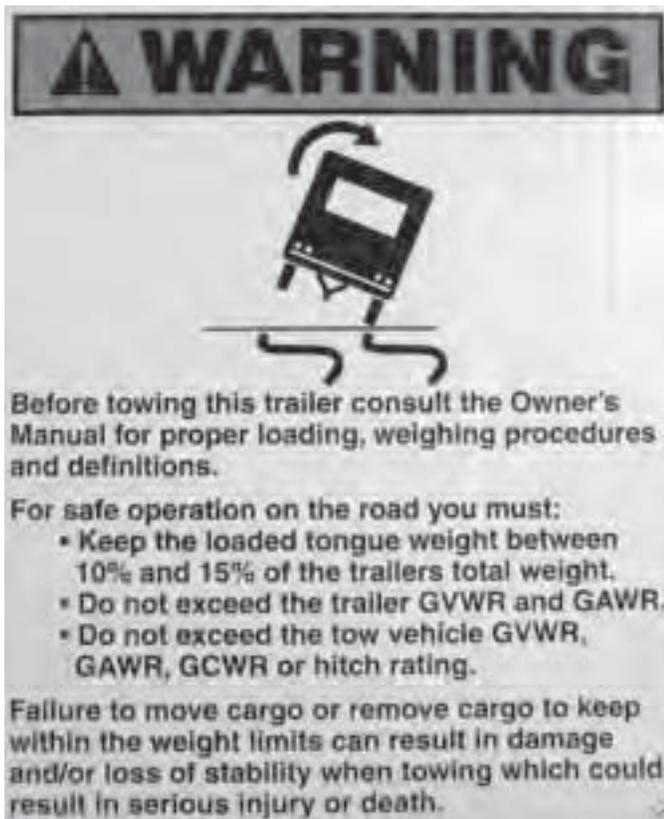


Water and propane also need to be considered. The weight of the fully filled propane containers is considered part of the weight of the RV before it is loaded with cargo and is not considered part of the usable cargo load. Water however, is a cargo weight and is treated as such. If there is a fresh water storage tank of 100 gallons, this tank when filled would weigh over 800 pounds. Consider this if your travel plans require you to carry water. Remember to keep the total amount

of cargo added to the vehicle 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 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 near or on the floor and as close to the axle positions as reasonable. Too many items on one side may overload a tire. The best way to know the actual weight of the vehicle is to weigh it at a public scale.

### Placing the Load



There are many different trailer designs but the loading rules are generally the same no matter what type of trailer you have. Typically, RV trailers fall into two categories: ramp trailers which are the ones commonly known as “toyboxes” or “toyhaulers”, and non-ramp or conventional style trailers. Ramp trailers combine RV living quarters with a large cargo area. All of the loading rules apply to both styles of trailer, but there are a couple of special loading rules for ramp trailers. When you load a ramp trailer, you should place approximately 60% of the total cargo weight either over or slightly forward of the center line of the axle assembly. On two-axle trailers this would be a point midway

between the axles, and on three-axle trailers this point would be over the center axle. Load vehicles and heavy cargo items in the cargo area as far forward as possible.

Big, heavy items should be loaded where they can be securely tied down. Everything should be securely tied down but that is not always possible. Start with top heavy items if you have them. That’s usually a good place to start because you must have plenty of room available to properly tie them down. Tying them straight down is not secure enough. They need to be tied off at several angles or they could fall over in an abrupt change in speed or direction. You need room to accomplish this. Smaller items can be used to fill the spaces around them later.

Once you have the heavy items located, check the tongue weight. If the load is radically off, make the changes necessary to get close. The smaller items can be loaded in such a way that they balance out the load. They should be located so that they will stay put. Placing them next to items that have already been tied down helps, but your main concern should be to not lose the balance of the trailer. Without planning, it is very easy to load one side of the trailer heavier than the other. This can cause tire failures from overloading. This can also cause a very serious problem when cornering, even causing the trailer to turn over in a sudden turn.

Top heavy loads can cause problems not only in cornering but also in hard braking. They have a tendency to make the trailer “dive” in hard braking conditions. This suddenly increases tongue weight and can decrease tow vehicle front axle loading just when you need steering and brakes the most. Center top heavy items or arrange the remainder of the load to act as a counter weight to minimize this effect.

Never place heavy objects on add-on devices hung on the rear bumper or placed across the tongue frame unless your RV is specifically designed and built to accommodate these loads. This places heavy objects where they will dramatically effect handling in corners or bumps. Heavy weights placed well behind the axle can also reduce stability. A bicycle may be fine to hang out on back, but not a motorcycle.

Use good common sense and always allow plenty of margin for safety.

### How To Weigh Your Loaded Trailer

It is important to verify that you have proper balance and have not exceeded any ratings.

Find a public weigh station. Locations of weigh stations or scales can be found in your local telephone directory. Many truck stops, grain elevators, moving and storage companies, gravel pits, and recycling centers have weigh stations that may be able to help you. Be sure your trailer is loaded as you intend for travel. Generally, the procedure will be similar to the following. There are several types of scales in use, and you should follow the attendant's instructions for positioning your trailer for the type of scale. The following procedure assumes a single platform scale is being used.

1. Pull the trailer onto the scales so that the trailer is centered on the platform and the rear wheels of the tow vehicle are off the scale platform. Leave the trailer hitched to the tow vehicle. Take a reading. This weight is the axle weight. This weight must not be more than the total of the Gross Axle Weight Ratings for all of the trailer axles.
2. If necessary, back the trailer until it can be unhitched from the tow vehicle and the landing gear or tongue jack can be lowered onto the scale platform. Unhitch the trailer from the tow vehicle, lower the landing gear or tongue so the trailer is level, and drive the tow vehicle off the scale platform. The trailer alone should be sitting on the scale platform. Take a reading. This weight is the total trailer weight. This weight must not be more than the Gross Vehicle Weight Rating (GVWR) or the GTW (Gross Towed Weight) as specified by the tow vehicle manufacturer.
3. Refer to the trailer weight information placard typically located on the left front side of the trailer. The Gross Weight limits of the axles and the Gross Vehicle Weight limit are printed on these forms. Compare the readings on the scale to the values printed on the placard. If any reading is higher than the printed rating, you must adjust or remove the excess weight.
4. To determine the left and/or right side weights, center only the left side trailer wheels on the scale platform. The trailer wheels on the other side will be off the scale platform. Take a reading. Write down this reading as "Left side weight". Subtract this reading from the total axle weight. The result

is the weight on the opposite side. Write down this value as "Right side weight". This weight will help you determine whether one side or the other is overloaded.

5. To determine the Gross Combined Weight, center both the trailer and tow vehicle on the scale platform. Take a reading. Compare the weight to the tow vehicle GCWR specification as listed on the tow vehicle weight ratings placard.

### Now That You Have Weighed Your Trailer . . .

The information you collect when you weigh your trailer will help you load your trailer properly so that you don't overload the trailer chassis components, tires, or your tow vehicle.

If you find a difference in the weights on one side of the trailer as compared to weights on the other side, tires, wheels, brakes, springs and other components on the heavier side could be overloaded, even though the total axle load is within the GAWR. It is important that you redistribute the load to avoid component failure, as well as to improve the handling characteristics of the trailer. With the actual weights in hand, you can now compare them against the GAWR, GVWR and tire capacities. The actual weights should also be used to help determine the proper air pressure for the tires. Redistribute the load to avoid component failure, as well as to improve the handling characteristics of the trailer.

### Determining The Correct Pin/ Tongue Weight Percentage

You must determine the amount of weight on the trailer coupler or fifth-wheel pin. Your trailer is the most stable when towing if the weight on the coupler is between 12% and 15% of the total loaded trailer weight, or between 15% and 25% for fifth-wheels.

## 8. Safe Driving & Towing

### Your Responsibilities As a Driver

Towing a trailer has a responsibility similar to properly driving your car. It is a skill that has to be developed and a responsibility that should be taken seriously. If you're towing an RV for the first time, drive only when traffic is light. Avoid uncomfortable traffic conditions. Get assistance from a friend with this type of experience to help you learn. Don't be embarrassed to ask questions or just stop, park and relax if you need to. Learn what it takes to keep from ruining your transmission when pulling heavy loads up a hill or burning up your brakes going down the other side. The hardest skill to learn is to know when not to tow a trailer. Your confidence will grow as your skills increase.

State laws in the United States and Mexico, and provincial laws in Canada are different concerning towing requirements and limits. Always be sure to check the laws in the areas where you anticipate traveling.

### Driving And Vehicle Control

Towing your trailer will be different from driving your family vehicle. Your trailer/tow vehicle combination is heavier, longer, wider and higher than a typical car or truck you may be accustomed to driving. You will have to adjust or learn new driving techniques to safely operate your RV. Keep this in mind as you become familiar with your trailer. New trailer owners should take special care to learn the driving and handling characteristics of your vehicle in safe and familiar surroundings. Drive defensively at all times. DO NOT drive if you are tired, have been drinking alcoholic beverages, are under the influence of any controlled substance, or are taking any medication or drugs that may impair your sight, hearing, judgment or coordination.

### Safe Driving Techniques

We want every Dutchmen RV owner to be a safe and courteous driver. The following rules will help you develop needed skills for safe trailer towing:

- Travel very slowly if you are new to trailer towing, or 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 the posted speed limit for trucks and trailers. As speed increases, trailer stability, stopping ability, and the ability to make emergency maneuvers are greatly reduced.
- Reduce speed before starting down hills. This will help you avoid heavy tow vehicle braking on downgrades. Trailer tow stability is reduced when traveling downhill, and is further reduced by tow vehicle braking.
- Slow down before entering turns and avoid heavy braking. 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."
- Check and monitor wind conditions in the areas where you expect to travel. 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.
- Avoid quick steering movements that can start the trailer swaying.

### Maneuvering In Traffic

A few hours of practice in a large empty parking lot will make pulling your trailer much easier. Mark out two corners for both left and right turns. Use these corners to practice turns, backing up and parking. As you practice, note how the tracks made by the trailer wheels are distinctly different from those made by your tow vehicle. Study these tracks as you perfect your skills. Be sure your tow vehicle is equipped with side-mounted rear view mirrors. They are required in most states, and are a must for maximum visibility.

Be cautious when maneuvering to allow for the length and width of your RV. Always allow room to corner and to change lanes. The rear view mirrors mounted on your tow vehicle will help you keep aware of your position and the position of other vehicles and/or

obstructions near you. Watch the mirrors. Learn to use them to view objects around you and your position on the road.

Remember that your trailer/tow vehicle is heavier than a car or your truck by itself, making your towing combination less maneuverable and harder to stop. Also, because of the greater side surface area of the trailer, it is more easily affected by cross winds. Allow extra distances for passing and stopping, and drive at a moderate speed, particularly in traffic and in gusty wind conditions.

Be aware of the extra height of your trailer. Check for low hanging tree branches or other obstructions whenever you drive or park. Avoid low overhangs when pulling in for service or fuel. Always check overhead clearances of overpasses and bridges. This is especially important if you drive with overhead vents open and because of roof racks or TV/radio/satellite antennas mounted on the trailer roof.

Always plan ahead. When approaching traffic lights let off the gas, and let the tow vehicle and trailer slow down. Avoid slamming on the brakes at the last second. When approaching dips and depressions in the road, slow down. Resume your normal speed only after you are sure the trailer wheels have cleared the dip. When you travel on rough roads, slow down and try to avoid potholes. Quick steering maneuvers at high speeds could cause unpredictable trailer reactions, and may cause furniture and items in the trailer to move around causing interior damage.

On freeways or expressways, choose your lane and stay in it! Always maintain sufficient space between you and the vehicle in front of you. For every 10 miles per hour of speed, allow at least double the length of the tow vehicle and trailer. For example, if you are traveling 60 miles per hour, allow six times the length of your RV. This may seem like a lot of distance, but at 60 miles per hour, you are covering 88 feet per second. You will need all of that distance to stop your RV under control. If your tow vehicle and trailer RV is 50 feet long, as an example, you have about four seconds to react and stop. You cannot stop that fast. You need to test your brakes and learn your RV's stopping capability. There are many variables involved, such as your brake control settings, loading, and your tow vehicle. You must learn how they all work together. And remember that you

will need much more time and distance to overtake and pass another vehicle.

Despite the best hitch, whenever a large bus or truck overtakes and passes your RV, you will feel some instability. The air being pushed ahead of the large vehicle pushes the rear of your trailer to one side, and then pushes the front. You may even feel the air pressure rock your tow vehicle. You will naturally want to apply the brakes or correct the steering. Do not apply the brakes, and just maintain the steering in a straight line. The slight swaying of your trailer will last for a very short time, and abrupt braking or steering corrections may cause real swaying problems that will be more difficult to handle. There is no need to panic, just watch your mirrors and adjust your position in the lane to give yourself more space between your RV and the passing vehicle. The effects of the air pressure wave are lessened if there is a greater distance between the two vehicles. If you feel a little "tail wagging", lightly apply the trailer brakes with the controller only. We'll cover more serious swaying later in this section.

On two-lane roads, other vehicles will collect behind you. It is both courteous and sensible to signal, pull onto the shoulder or turnout and let them pass. In some places, the law requires you to pull over and let other vehicles pass. Check your mirrors often, and when you see traffic behind you, pull over.

On slippery pavement, avoid using the engine to help slow down as this may cause the tow vehicle wheels to skid. On icy pavement, drive slowly. If you feel the tow vehicle skidding, gently apply the trailer brakes only with the controller. This will bring the tow vehicle and trailer back into a straight line. And remember that chains on the tow vehicle do not help the trailer wheels.

If you get into mud or sand, let the momentum carry the RV through. Apply power very gently, and use as little as possible. Stay in any tracks of any vehicle(s) ahead of you. Keep the tow vehicle in the highest possible gear. If you do get stuck, tow the RV out without unhitching. Disconnect the weight-distribution spring bars before towing in this situation.



After traveling some distance, pull over and check the heat at the trailer wheel hubs. Use one of the inexpensive infrared thermometer guns available from tool suppliers. The hub temperature should be nearly the same at each hub. If you notice a temperature at any wheel that is significantly higher than the others, the brakes may not be adjusted correctly, or there may be another problem with the brake system or wheel bearings. Check the tire pressures and temperatures all around. A hot tire usually indicates low air pressure in that tire.



The brake controller (not supplied with your RV) is activated when you apply the tow vehicle brakes. This sends an electrical current to the trailer brakes. You can also apply the trailer brakes independently from the tow vehicle by operating the brake controller by hand. Under normal conditions, you should not operate the trailer brakes by hand, but you have the option when it is needed. See the operating instructions for your brake controller for more information.

Remember that a temporary increase in loading occurs during dips or bumps in the road. A severe dip causes increased weight to suddenly be placed on hitch, axles and tires. Though hitch manufacturers take this into consideration in their designs, an overloaded or old, cracked and rusted hitch or tongue can be suddenly stressed beyond capacity, causing it to fail. Watch for bumps and large dips in the road and try to slow down for them.

### **Backing Up and Parking**

Backing a trailer can be a challenge even for experienced drivers. It takes practice to perfect the necessary skills. Improper or careless backing can result in possible injury or, more likely, expensive damage. Of course, if you can avoid backing up altogether – arrive in daylight or request a pull-through site – you'll be much better off. Just remember to take your time. Be patient, and try not to get upset if you don't successfully back in on the first attempt. Remember, it's not as easy as it looks – even for old pros.

We mentioned previously that your trailering RV is much larger than the car or truck you normally drive. Terrain and road surfaces, visibility, and even driver fatigue can affect your ability to back and park your trailer.

Backing your trailer can be more than just getting it into a site at a campground or RV park. There can be many other backing situations that require close driver attention and backing skills. Consider some of these other situations:

- Backing into an RV storage space.
- Driving into a dead-end street by mistake.
- A fuel pump is not located where you expect it or need it.
- Entering a parking lot that does not have a pull-through lane.
- Entering a fast-food restaurant pull-through lane with height or width limitations.
- Unexpected low overhead or bridge weight limitations while driving on local roads.

Some backing situations require you to be more careful and attentive:

- Backing into an RV site to avoid campers, other RVs, shrubs, trees, picnic tables and utility hookups.
- Anytime children are present. Children always assume if they can see you, then you can see them.
- Backing up at night means reduced visibility. It's difficult to estimate distance in low light or darkness.
- Backing up in gas stations or supermarket parking lots. When an RV pulls up and stops, other vehicles may not be visible in your mirrors when they pull up right in back of you.

The most important factors to backing up safely include paying close attention, being patient, watching and listening for anything unexpected. Avoid pulling into commercial, shopping or industrial areas while towing if you're unfamiliar with the layout. You may not know how to get out without having to back up. Sometimes calling ahead to your destination before you arrive can save time and effort. Ask about specific directions and parking limitations. If you are unable to call ahead, when you arrive, park out on the street and then walk in to investigate.

You will often be backing and parking your RV in a limited-size space. Before you know if it will fit, you have to know how big it is. Minimize surprises by spending some time to collect the following information:

- The total length of the tow vehicle and trailer from the front bumper of the tow vehicle to the rear bumper of the trailer.
- Total width of the RV, including all mirrors on the tow vehicle Total height, including all roof-mounted accessories such as A/C units, roof vents, satellite dish and TV antennas, storage boxes and CB and radio antennas.

Whenever possible, pull into parking situations that allow you to "pull through" thus avoiding backing. If your situation allows it, before backing up, get out and walk around the location where the RV is to go. Check to see if awnings or slideouts will fit safely when extended, and look overhead for tree limbs or low wires. Then look down and around for sloping sites, tree trunks and tree limbs, utility hookups, picnic tables, large rocks, railroad ties, wooden posts, cables and fences often used to separate camping sites, or any other objects that could damage the trailer.

Eliminate distractions by requesting passengers to refrain from talking while you are backing. Turn off radios, TVs, and other distractive sources of noise. When backing, just remember to slow down and take your time. If the trailer doesn't go where you want it to, just stop. Concentrate on the back of the trailer. Remember that you have poor visibility to the rear. Always use a "spotter" when backing up. Someone standing safely outside at the rear of the trailer to guide you will help you back the trailer safely. Use the rear view mirrors to watch what is happening behind you and keep an eye on both sides of the tow vehicle. Continually monitor the location of the front mirrors and front corners, as well as the rear of the RV to avoid obstacles.

#### **Follow These Tips For Backing Up:**

1. Align the trailer and tow vehicle in a straight line, if possible. Also, backing to the left is easier because your rear visibility is better. Position your "spotter" so they are visible in your side mirror.
2. Start backing slowly. With your hand at the bottom of the steering wheel, turn the wheel in the direction you want the rear of the trailer to go. Watch in the mirrors or out the window until the rear of the trailer is pointing in the desired direction. Note that the rear of the tow vehicle will go in the opposite direction of the trailer. Be careful as the trailer/tow vehicle angle changes. You can quickly get into

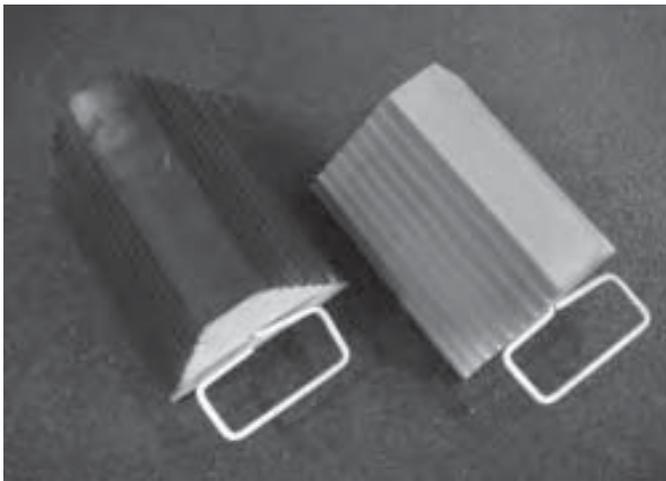
a jackknifed position that could cause damage to the tow vehicle or trailer.

3. When the trailer is pointing in the desired direction, start turning the steering wheel in the opposite direction. This will cause the tow vehicle to follow the trailer in an arc.
4. Straighten the tow vehicle and trailer by turning the steering wheel more sharply. When you get more into a straight line, straighten the wheel. Adjust your position as necessary.
5. If you don't make it on the first try, just pull forward to straighten things out, and start over.

When you park, look around and observe any poles or other obstructions beyond the curb or past the wheel track. Remember that the front and rear portions of the trailer swing wider than the tow vehicle's body. On level ground, always shift the tow vehicle transmission to Park (automatic transmissions) or low or reverse (manual transmissions), and set the parking brake.

Try to avoid parking on a grade or hill. If parking on a grade is unavoidable, follow these steps:

1. Apply and hold the tow vehicle brakes.
2. Have an assistant place wheel chocks under the trailer wheels.



3. When the wheel chocks are in place and the assistant is clear of the vehicles, release the tow vehicle brakes until the chocks absorb the load.
4. Apply the tow vehicle parking brake.
5. Shift the tow vehicle transmission to PARK (automatic) or low or reverse (manual). Don't shift into 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 you will not be able to shift it out of PARK.

When starting after being parked on a grade:

1. Apply and hold the tow vehicle brakes.
2. Start the engine in PARK (automatic) or neutral (manual) with the parking brake set.
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.

### **WARNING**

*Excessive sway or fishtailing of your trailer can lead to the rollover of the trailer and tow vehicle. Serious injury or death can occur. It is important that you read and understand the information in this section.*

### **Controlling Trailer Sway or Fishtailing**

Sway or fishtailing is the sideways action of a trailer caused by external forces. Trailer sway can occur at any time. It cannot be prevented completely, but you can learn how to control your RV if and when it happens. It often occurs in response to strong winds or crosswinds or when passed by or passing a large truck and trailer on a downhill.

Trailer sway or fishtailing is primarily influenced by these factors:

- *Equipment:* When hitched together, the trailer and tow vehicle must be level. The tires of both the trailer and tow vehicle should be in good condition and inflated to the recommended pressure as noted on the tires.

Your trailer brakes should work in synchronization with your tow vehicle brakes. Never use your tow vehicle brakes alone to stop the combined load. Your brake controller must be set up according to the manufacturer's specifications to ensure proper synchronization between the tow vehicle and the trailer. Additionally, you may have to make small adjustments occasionally to accommodate changing loads and driving conditions. We recommend a hitch with built in sway control be utilized on your unit. Please consult with your RV dealer regard-

ing this equipment, as Dutchmen does not provide sway control devices.

- *Tongue Weight:* The tongue weight should be between 12% and 15% of the total travel trailer weight. See Chapter 7 of this Owner's Guide regarding the proper loading and weighing of your trailer.
- *Driving:* This is the most important factor. The tendency for the trailer to sway increases as your speed increases. Obey all speed limits and reduce speed during bad weather or windy conditions.

Several different forces working together can cause swaying. Speed and wind are two of these forces, so you should never drive faster to try and eliminate swaying or any other problem.

Instability can also be caused by road conditions, other vehicles and — most importantly — incorrect or inadequate driver control inputs. If you make abrupt braking or steering changes, travel too fast for road and traffic conditions, ignore the mechanical components of your RV, including tire pressures, your towing situation will be more susceptible to instability and swaying.

- *Corrective measures:* If you find yourself in a situation where the trailer is beginning to sway or otherwise feels unstable, here are some techniques that will help:

The moment your trailer shows any tendency to sway, you should slow down immediately by removing your foot from the accelerator. Avoid strong or hard tow vehicle braking unless there is a danger of collision. Reduce speed gradually whenever possible. Apply the brakes gently and progressively. A properly adjusted brake controller will apply the trailer brakes first. If you can do so safely, use the brake hand controller to gradually apply the trailer brakes. This will help to keep the vehicles aligned. If you apply the tow vehicle brakes only, trailer stability will be reduced, and skidding the tow vehicle tires can cause loss of control and jackknifing. Practice using the brake hand controller on a deserted parking lot. Don't wait until an emergency occurs to learn how to use it. The brake hand controller should be located where it is easily accessible.

Do not jam on the brakes or attempt to accelerate your way out of the swaying. Both actions make the situation worse and could cause severe injury or death.

Steer as little as possible while maintaining control of the RV. Because of natural reaction lag time, quick steering movements to counter trailer sway will actually cause increased sway and loss of control. Keep both hands on the wheel. Hold the wheel as straight as possible until stability is regained.

Once the swaying is under control, stop as soon as possible. Check tire pressures and cargo weight distribution. Look for any signs of mechanical failure. Travel at reduced speeds that permit full control until the problem can be identified and corrected.

### **Driving In Windy Conditions**

Wind can create hazardous conditions when towing a trailer. Wind can cause your RV to oscillate or suddenly pull to one side. Thirty mile an hour crosswinds can blow you off the road if there is a sudden gust. For example, say a hard gust of wind hits your RV from the left. Your RV pitches to the right and moves towards right. In order to stay on the road you steer to the left. With the RV leaning to the right, the centrifugal force generated by steering left can be the added ingredient that puts you on your side, or worse yet, down the side of a ravine. The only way to lower the risk of traveling in these conditions is to slow down. The safest way is not to drive in extremely windy conditions. Park it until it's safe to continue.

### **Extreme Driving Conditions**

Driving on winding or mountain roads is not difficult if done with care. When driving in mountainous areas, look for and obey highway signs concerning grades and curves. Your driving experience when pulling and stopping a trailer on mountain roads will be very different from what you experience on level ground.

Mountain driving or desert temperatures can put extreme demands on the drive train components of your tow vehicle. Observe proper vehicle speeds when ascending or descending hills and always operate in the proper transmission range.

Downshift on hills to avoid overheating or excessive engine loads. Downshift when descending grades. Engine compression and friction will help control vehicle speed, and relieve some of the strain on the brakes. Shift the transmission to a lower gear before starting down the grade. The engine braking effect can help control downhill speed and will help ease the load on the service brakes.

Downhill driving puts extra strain on many drivetrain components of your tow vehicle. The brakes can become overloaded and overheated when used for downhill slowing. Brake fade will occur if the brakes overheat.

Rule of thumb: Use the same lowest gear going down as it took to go up the hill. Crest the hill in the lower gear. Watch your speed and pay attention to any caution signs along the road. You can also use the trailer brake controller to help control downhill speed and ease the load on the tow vehicle brakes.

When descending grades, never use a higher gear than was used to climb the same or similar grade. Select a gear that will keep you at a safe speed with minimal brake application. NEVER ride the brakes when descending a grade. Riding the brakes will cause excessive brake heat resulting in brake fade and leaving you with little or no stopping power.

Some tow vehicle engine manufacturers specify both maximum and minimum engine RPM in any transmission gear. With some engines, either over-revving or lugging the engine can cause serious engine damage. Become familiar with the operating limits of your tow vehicle engine. When ascending grades, shift to a lower gear when engine speed drops to the engine manufacturer's specified minimum RPM and keep the engine speed in the RPM mid-range of the selected transmission gear. Driving in hot weather, and especially in hilly or mountainous areas, requires different driving techniques than driving on flat ground or in cooler weather. Be sure tire pressures are correct. Tire overheating can cause tread delamination and tire failure. It is especially important to watch engine coolant temperature under these conditions. If the tow vehicle engine temperature indicator indicates overheating:

Reduce road speed and shift to the next lower gear to keep the engine running at higher RPM, but not over-revving. In most cases, this will stabilize the engine temperature.

If the temperature indicator continues to indicate overheating, safely pull over to the side of the road (use turnouts on mountain roads) and stop. Shift the transmission into P (PARK). Increase engine speed until the temperature drops down into the normal range.

If the temperature indicator does not begin to show normal engine temperature, shut down the engine and allow it to cool. After the engine is cooled down, check

the coolant level in the reservoir and if necessary, add the proper mixture of coolant and water.

### **If You Get A Flat Tire . . .**

Tire changing instructions are in the Tires & Wheels chapter of this Owner's Guide.

A sudden tire failure ("blowout") will usually be accompanied by a sudden reduction in stability of your RV. Depending on which tire is involved, the steering could feel a little "mushy" or you may feel a little swaying. A tire that goes flat slowly will not cause a sudden unstable feeling. It will be more gradual, and you could wind up driving a long distance before you notice the tire is flat. Running a flat tire is very dangerous. The increased friction will cause the tire to overheat and possibly ignite, causing a fire that may be very difficult to extinguish. Knowing this, keep an eye on your tires by checking the rear view mirrors while driving. When you stop, check the tires by whacking them on the tread surface with a short piece of pipe or broom handle. Check the tire temperature. Pay attention to other drivers that may give you hand signals or otherwise try to communicate with you that something is wrong. If you see smoke coming from your wheels, or if someone is signalling to you, stop immediately, as safely as possible, and check the situation.

If you experience a sudden tire failure:

- Avoid heavy braking application and gradually decrease speed.
- Hold the steering wheel firmly and move carefully to a safe place off the road.
- Park on a firm, level spot if possible.
- Turn off the vehicle ignition.
- Turn on the vehicle hazard warning flasher system.

If possible, summon professional help through your auto club road service, or local tire service facility. Do not attempt to change the tire yourself. A lifting jack is not supplied with the trailer.

### **Altering Your Trailer**

Many RV owners like to add personal touches to their units. But there is a difference between changing how your trailer looks and how it handles and performs. If you consider any type of alteration to your trailer, be sure you understand how the alteration will change or affect the stability, handling, vehicle response, and

overall performance and safety of your trailer or your tow vehicle/ trailer combination. An improper alteration that affects vehicle handling or response can cause a vehicle crash, and any improper alteration to the electrical or propane systems can cause a fire and can endanger your trailer and its occupants. Never alter the trailer chassis. Any of the following alterations to the chassis may limit the chassis warranty, and may limit your warranty coverage of other trailer components or systems:

- alterations affecting the axles, brakes, and/or suspension components;
- any alteration to the main frame components;
- any alteration to the coupler or pin box components;
- the addition of cargo racks or platforms to any part of the trailer;
- the addition of any lifting or height increasing device; and/or
- use of a “gooseneck” style hitch device.

### **Maintenance**

It is your responsibility as the trailer owner/operator to properly maintain your trailer and its systems. Consult this Owner’s Guide and any operating and maintenance guides included in your Owner’s Information Packet for service and maintenance information. Keep your trailer properly maintained.

### **Warning Devices**

Your trailer is equipped with warning devices. These devices were discussed in a previous chapter. Check them before a trip for proper operation. A disabled warning device cannot warn you or your occupants of a life- threatening danger. Keep them working and respond to them quickly.

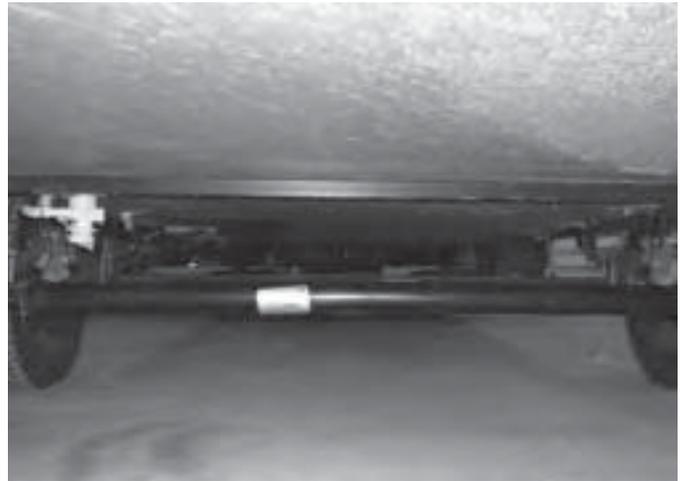
## 9. Axles, Suspension & Brakes

### Axles

The axle weight ratings are listed on the DOT placards and tags located on the front left side of the trailer. The axles are designed to last the life of the trailer without service, except for lubrication of the wheel bearing, adjustment (torque setting) and inspection of the shackles, shackle links, U-bolts and springs. “Easy lube” fittings are installed under the hub caps or center caps to make maintenance easier. A complete guide to axle maintenance requirements and procedures is in the “Care and Maintenance” chapter, and in your Owner’s Package.



The axles are a hollow-tube design and are cambered by the axle manufacturer. Cambering means that the axle has a slight precision bend that compensates for the trailer load. You may notice a slight outward tilt at the top of the wheels when the trailer is unloaded. This is caused by the cambering. As the trailer is loaded, the axle will straighten and the wheels will be straight up and down. If you continue to load the trailer beyond the axle load ratings, the axle may bend the other way, and the wheels may appear to have an inward tilt. If you see the tops of your wheels tilting inward, this is a sign of axle overload.



### Suspension System

Most Dutchmen trailers use double-eye leaf spring suspension or a torsion axle suspension.

Please note that the total axle vertical travel is only about 1-1/4". Keep this in mind when traveling. Although you may not feel irregularities in the road because of your tow vehicle’s longer springs, the trailer’s stiffer suspension doesn’t absorb bumps and potholes the same way. The springs on your tow vehicle are considerably longer and have a much greater total vertical travel. This is what helps give your tow vehicle a smooth ride. Under certain conditions, you may see your trailer “bounce” more than you expect.

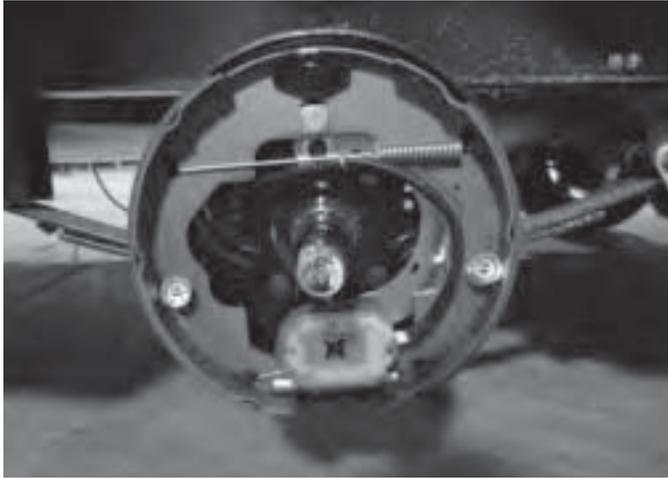
Generally, this is normal. If you travel in areas where road conditions are severe, slow down to reduce the possibility of damage to your suspension system, the trailer structure or items inside the trailer.

### Electric Brakes

#### **NOTE**

*The brake controller is not supplied with the trailer. If you have not chosen and installed a brake controller in your tow vehicle, see your trailer dealer.*

*Check brake shoe adjustment regularly. They should be in the same adjustment as the tow vehicle brakes. Loose, worn, or damaged wheel bearings are a common cause of “grabby” brakes.*



Your trailer is equipped with electric brakes. They are similar to the drum brakes in many trucks and cars. The basic difference is that rather than using hydraulic pressure for activation, your trailer brakes are actuated by an electromagnet.

A controller (not supplied with the trailer) is installed in your tow vehicle that controls the amount of electrical current sent to the trailer brake assemblies. Some older controllers are connected to the tow vehicle brake system and react to the hydraulic pressure when you press the brake pedal. Most controllers currently available operate by sensing how much you are slowing down and apply the trailer brakes accordingly. These are referred to as “inertia” type controllers. Other controllers operate by applying the trailer brakes proportionately to how long the brake pedal has been pressed, and are called “time-based” controllers. Although you can choose whichever type controller best suits your needs and budget, the inertia- type is recommended. This type controller will give you the most natural feeling brake application, and provides trailer braking that more closely follows your tow vehicle braking.

No matter which type of controller you use, under most towing conditions, the trailer brakes are operated by 12- volts DC from the tow vehicle electrical system. The 7-way power cord carries the electrical power to the trailer brakes, and the cord must be connected at all times while towing. The diagram at the end of this section shows a typical brake system electrical schematic.

The controller in the truck cab can be adjusted to affect the rate of application of the trailer brakes. This adjustment does not affect the maximum braking capacity of the brakes. It should be adjusted so that the tow vehicle and trailer brakes are balanced, and provide a safe, comfortable stop. The trailer brakes should

just slightly lead the tow vehicle brakes. Always adjust the controller according to the manufacturer’s instructions. When it is properly adjusted, you should feel no sensation of the trailer pushing the tow vehicle nor of the trailer pulling the tow vehicle during a stop. See the axle operation and maintenance guide in your Owner’s Information Packet for details on brake and controller synchronization.

### Breakaway Switch



The breakaway switch is a special trailer brake control that operates the trailer brakes in case the trailer ever becomes uncoupled while towing. Power for the breakaway system comes from the trailer batteries and is supplied to the brakes through the switch. The switch is located on the A-frame coupler (pin box on fifth-wheels). It has a steel lanyard which must be fastened to a rigid part of the tow vehicle frame or hitch assembly. Should the trailer become unhitched, the switch is activated when the cable pulls the pin out of the switch, applying the trailer brakes. Towing the trailer with a defective breakaway switch is both dangerous and illegal in most places.

### **! CAUTION**

*Do not loop the breakaway switch lanyard over the hitch ball or to any removable part of the hitch assembly. Contact of the switch cable with moving parts could cause damage, leaving the switch inoperable.*

Test the operation of the breakaway switch periodically. To insure safe operation, the cable must be secured properly to a rigid part of the tow vehicle frame or to an unremovable part of the hitch on the tow vehicle. Do not loop the breakaway switch lanyard over the hitch ball or to any removable part of the hitch assembly. Never use the breakaway switch for parking, or remove the pin from the switch. This will apply the trailer brakes and run down the trailer batteries, and possibly

damage the switch contacts and brake shoe magnets. When disconnecting the trailer from the tow vehicle, remove the lanyard from the tow vehicle.

### **CAUTION**

*Do not use the breakaway switch as a parking brake. The trailer batteries will be discharged rapidly and the brake magnets may be damaged.*

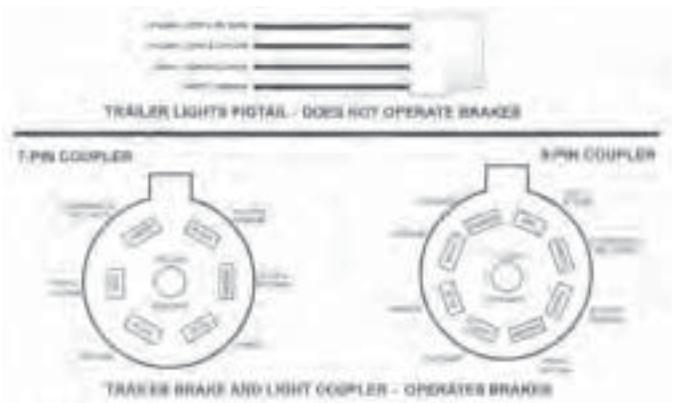
The magnets, brake shoes and related components on the trailer axles are what actually stop your trailer. The magnets and brake shoes are “wear” items meaning that over time they wear out and you have to replace them as a part of normal maintenance. Please note that trailer brakes do not have the same life expectancy as the brakes on your car or truck. They will typically last 10,000 - 20,000 miles depending on your towing conditions. Certain conditions will shorten the life of the brake components. If you travel mostly on paved roads and operate the brakes properly with a properly adjusted controller, you can expect the maximum life. If you travel mostly on dirt roads, in sand or in other harsh road conditions, or if your controller is not set up properly you can expect shorter brake component life. Your driving technique will also significantly impact the life of your brakes. Hard stops from high speeds will shorten brake life. Also note that the trailer brakes are not self-adjusting as are most car and truck brakes. The trailer brakes will need periodic adjustment. Please follow the recommended inspection, adjustment and service intervals as outlined in the axle operation and maintenance guide.

### **CAUTION**

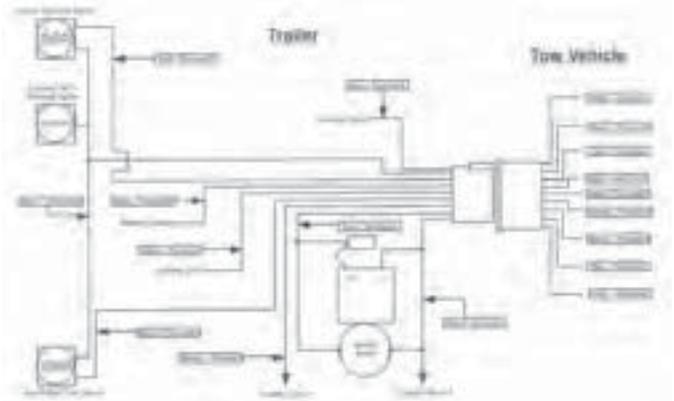
*Be sure the trailer batteries are charged before traveling, and that the charge line from the tow vehicle is connected. Proper operation of the brakes by the breakaway switch requires fully charged batteries, or connection a power source equivalent to or greater than an automotive type 12- volt, 12-amp-hour wet-cell battery.*

### **NOTICE**

*Failure to disconnect the unit from the 7-way tow vehicle cord prior to testing the breakaway switch may cause damage to the brake controller.*



*Typical Trailer Brake System Schematic*



*Typical 7 Point Trailer Plug*

## 10. Travel

Since your dealer probably had your new trailer hitched up to your tow vehicle when you took delivery, your first task as a new owner will be to unhitch and stabilize it at home or first camp site. So that's where we'll start, along with some information about setup and stabilizing equipment and techniques. We'll go on to preparing for travel and hitching up later in the chapter.

### Landing Legs (5th-Wheels Only)

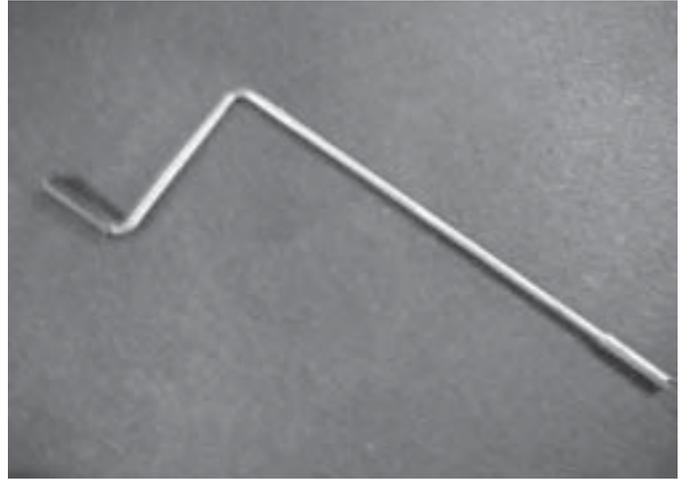


#### **WARNING**

*Do not exceed the individual leg or system load ratings. Do not use the legs to jack up the trailer during tire changes. The legs are not designed to support the trailer's weight during tire changes or servicing. Never drop the trailer off the hitch.*

#### **CAUTION**

*Do not attempt to raise the trailer on one landing gear only. Uneven distribution of weight on the landing gear jacks will make the trailer unstable and may damage the overloaded jack.*



#### **CAUTION**

*The crank handle will rotate when the electric drive motor is operated. Remove the crank handle before using the electric motor to prevent injury.*

The landing legs of a 5th-wheel trailer are used for positioning the trailer during hitching and unhitching from the tow vehicle and to support the trailer during camping and storage. They level the trailer front-to-rear to provide comfort for the occupants, and to allow the refrigerator to operate properly. They are not designed to support the full weight of the trailer to change tires or for servicing the trailer. Do not use the landing legs to raise the tires off the ground.

The landing legs are made up of three steel tubes that slide inside of each other, either a hand crank or electric motor drive that turns gears, a screw-drive shaft in each leg to extend or retract the legs, foot pads, pull pins and related hardware.

## Tongue Jack (Conventional Trailers Only)



### **! WARNING**

*Do not exceed the tongue jack load rating. Do not use the tongue jack to jack up the trailer during tire changes. The tongue jack is not designed to support the trailer's weight during tire changes or servicing. Never drop the trailer off the hitch.*

The tongue jack of a conventional trailer is used for positioning the trailer during hitching and unhitching from the tow vehicle and to support the trailer during camping and storage. They level the trailer front-to-rear to provide comfort for the occupants, and to allow the refrigerator to operate properly. It is not designed to support the full weight of the trailer to change tires or for servicing the trailer. Do not use the tongue jack to raise the tires off the ground.

The tongue jack is made up of steel tubes that slide inside of each other, either a hand crank or electric motor drive that turns gears, a screw-drive shaft to extend or retract the jack, a foot pad and related hardware.

## Stabilizer Jacks



### **! CAUTION**

*Do not attempt to raise or place all of the trailer's weight on the stabilizer jacks. This may damage the jack or cause the RV to shift or move.*

### **! CAUTION**

*Do not use the stabilizer jack for any purpose other than stabilizing the trailer. Use only the stock handle supplied. Do not use a cheater bar on the handle, or damage to the jack may occur.*

Stabilizer jacks are located at the corners of the trailer frame. They are designed to stabilize the trailer after it has been leveled at the camp site. They are not designed to level the trailer or to support the full weight of the trailer to change tires or for servicing the trailer. Do not use the stabilizer jacks to raise the tires off the ground. Use them to give the trailer a firm setting and to keep it from "bouncing" when you move around inside. If you use after-market stabilizer jacks, they must be placed under the chassis frame rails only.

## Unhitching A Fifth Wheel (Full Unhitch)

### **! WARNING**

*Never stand between the tow vehicle and the trailer. Unexpected vehicle movement could pin a person between the tow vehicle and the trailer.*

### **! WARNING**

*When lowering the landing gear and stabilizing jacks, keep all body parts away from the bottom of the gear and/or jack.*

**! CAUTION**

*Do not attempt to raise the trailer on one landing gear only. Uneven distribution of weight on the landing gear jacks will make the trailer unstable and may damage the overloaded jack.*

**! CAUTION**

*Make sure you have adequate lighting to safely operate all equipment and vehicles.*

Always try to park your trailer as level as possible. When you are unable to find a reasonably level place, you should use leveling blocks under the trailer wheels before unhitching. An accessory visual level available at RV supply stores can be installed on the front/side of the trailer to assist leveling.

1. When you have located your intended parking space, look over the site carefully. Check above the site and the approach to the site to be sure there are no overhead obstacles that might damage the trailer or that might be damaged by it. Check the side clearance to be sure the slide-outs (if equipped) can be extended without interference. Ensure the ground is not soft or uneven and will support the weight of the trailer on the stabilizing jacks or other support devices.
2. Drive the fifth-wheel onto the site. Use commercial plastic or solid wood levelling blocks if necessary to level the trailer. Do not use rocks, concrete blocks or pavers, bricks, or particle board as leveling blocks. Place the blocks on the ground forward of the wheels, and tow the trailer onto the blocks. Chock the trailer wheels so there is no wheel movement.
3. Extend the landing gear legs. Insert the hand crank into the alignment tube until the end engages the cross shaft. For electric drive, do not insert the crank handle. Turn the crank clockwise, or press the switch (electric drive) in the DOWN position until the middle tube is halfway to the ground. This will optimize the overlap of all tubes, maximizing trailer stability.



Pull the lock pin on the landing gear leg and allow the drop tube to drop to the ground. Adjust the tube up or down so you can re-engage or re-pin in the nearest adjustment hole.

Repeat for the other side. Begin to extend the landing gear to raise the trailer until the lock pins engage. If the lock pins do not engage simultaneously, the ground is not level in the landing gear area. Under these circumstances, use solid wood or plastic wedges to even the load of the landing gear legs.



Raise the unlocked drop tube until the pin locks. Slide the wedge under the foot. If it does not fit, raise the drop tube to the next lock position. Kick the wedge into place firmly.

NOTE: If the parking spot is on asphalt on a very hot day or on dirt and/or gravel, a block of wood under each landing gear leg can be used to spread the load and reduce the possibility of the leg sinking into the surface.

4. Extend the landing gear legs until there is a small gap between the hitch and trailer pin box.
5. Lower the truck tailgate. Remove all obstacles in the truck bed. Disconnect the 7-way cord and the breakaway switch from the truck. Lay the cables over the tailgate.
6. Unlock the 5th-wheel hitch keeper. Slowly drive the truck forward until the king pin disengages from the hitch. Stop the truck, if the trailer does not disengage, the king pin and hitch may be binding. Move the truck about one-quarter inch front or back to free the king pin.
7. When the king pin is free, move the truck away.
8. Raise or lower the landing gears checking the front to back level with a bubble level. Remove and stow the crank handle (manual operation).
9. Lower the rear stabilizer jacks. On soft ground, place a load spreader board under the jacks. Lower the jacks to the ground and firm them up.

NOTE: Setting up the trailer without a complete unhitch allows you to locate the trailer at a site when you want to leave the trailer attached to the truck. Use steps 1 through 3 and steps 8 and 9 above. When extending the landing gear legs, avoid using the landing gear to lift or raise the truck. Since you will not be disconnecting the king pin from the truck hitch, the truck will be an additional load on the landing gear. If you cannot level the trailer reasonably well without lifting the truck, you will need to reposition the trailer on a more level surface.

## NOTICE

*At either full extension or full retraction, you may hear a clicking noise from the motor. This is the action of the slip clutch built into the drive motor to protect it against overload or to prevent over-extension or over-retraction. Release the switch as soon as you hear this noise to prevent damage to the motor or bevel gears at the top of the legs. If you hear this noise when the legs are neither fully extended nor fully retracted, one or both of the legs may*

*be overloaded and you will have to shift items around in the trailer or remove items from the trailer. Continuing to operate the legs overloaded will lead to premature wear and poor performance of the legs.*

## NOTICE

*Never move the trailer with the landing gear legs down.*

Once the trailer is stabilized, you can continue with setting up the trailer by connecting to site facilities, extending slide-outs, etc. according to your personal preferences and needs. There is no particular order to set up procedures, and with practice you will find the order that is the most efficient for your situation.

### Conventional Trailer Unhitching & Leveling

## NOTICE

*After-market stabilizer stands must be placed only under chassis frame rails. Stabilizer jacks should not be placed at extreme corners of the frame. Locating stabilizers in these locations can cause slide-room damage if leveling blocks were to shift or settle. Do not attempt to level, raise or otherwise place all of the weight of the unit on the stabilizer jacks. Do not use stabilizer jacks for tire-changing.*

Always try to park your trailer as level as possible. When you are unable to find a reasonably level place, you should use leveling blocks under the trailer wheels before unhitching. An accessory visual level available at RV supply stores can be installed on the front/side of the trailer to assist leveling.

1. When you have located your intended parking space, look over the site carefully. Check above the site and the approach to the site to be sure there are no overhead obstacles that might damage the trailer or that might be damaged by it. Check the side clearance to be sure the slide-outs (if equipped) can be extended without interference. Ensure the ground is not soft or uneven and will support the weight of the trailer on the stabilizing jacks or other support devices.
2. Drive the trailer onto the site. Use commercial plastic or solid wood levelling blocks if necessary to level the trailer. Do not use rocks, concrete blocks or pavers, bricks, or particle board as leveling blocks. Place the blocks on the ground forward of the wheels, and tow the trailer onto the blocks. Check the trailer wheels so there is no wheel movement.

- Put the foot pad on the tongue jack post, and turn the tongue jack crank clockwise (or press the switch to EXTEND) to lower the tongue jack nearly to the ground. If the ground surface is soft or may not be able to fully support the weight of the trailer tongue, place a sturdy 2" x 6" wood block under the jack post foot pad to support the jack post. The block should rest level and remain stable.



- Disconnect the breakaway switch lanyard and safety chains. Unplug the 7-way cord from the tow vehicle.
- Unlatch the hitch ball lock.
- Turn the tongue jack clockwise (or press switch to EXTEND) to lower the jack post until the trailer tongue rises up and off the tow vehicle hitch ball. When the tongue is completely off the ball, drive the tow vehicle forward out of the way.
- Check the level of the trailer with a carpenter's level both crosswise and lengthwise on the trailer floor. Raise or lower the tongue with the jack until the trailer is reasonably level front to rear. Put a small round bubble level inside the refrigerator to help determine proper level for refrigerator operation.

**! WARNING**

*Never stand between the tow vehicle and the trailer. Unexpected vehicle movement could pin a person between the tow vehicle and the trailer. Failure to comply could result in serious injury or death.*

**NOTICE**

*Never move the trailer with the tongue jack down and supporting the trailer tongue.*

**NOTICE**

*After-market stabilizer stands must be placed only under chassis frame rails. Stabilizer jacks should not be placed at extreme corners of the frame. Locating stabilizers in these locations can cause slide-room damage if leveling blocks were to shift or settle. Do not attempt to level, raise or otherwise place all of the weight of the unit on the stabilizer jacks.*

- Lower stabilizers, if desired. 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.

Once the trailer is stabilized, you can continue with setting up the trailer by connecting to site facilities, extending slide-outs, etc. according to your personal preferences and needs. Although there are no rules about setting up, usually you'll connect to the electrical service first so you can have light when needed or operate other electrical power needs. With practice you will find the order that is the most efficient for your situation.

**! WARNING**

*Do not attempt to use the stabilizer jacks or the tongue jack to change a trailer tire. Damage to the stabilizer jack may occur allowing the RV to fall during a tire change; only use a jack rated to lift the weight of the RV when changing a tire.*

**The Entry Step**

The entry steps make it easy to enter and exit your trailer. There are a few things that you should know to be safe and to keep the steps operating the way they should.

The steps consist of several elements that fold over each other to store compactly under the trailer body. There may be up to four step elements depending on trailer model. They all operate the same, as shown below (4-element step shown).



### Extending The Entry Step

#### **WARNING**

*Keep fingers, feet and other body parts away from the step hinges when lowering or raising the entry step. The hinges form a “scissor-like” device and can cause serious injury to or amputation of fingers or toes.*

1. Grasp and pull up and out on the release handle under the top of the step assembly. Pull step assembly out from trailer body. Grasp and wiggle the step to be sure it is completely extended and locked in position.



2. Rotate the step elements out and downward.
3. Fold the bottom step down. Be sure bottom step is unfolded completely.
4. Reverse the procedure to retract. Be sure the step assembly is secure.

The steps will become a routine item in your daily life with your trailer. But there are some safety precautions that you should be aware of that will help you use the

steps safely and keep them working for the life of the trailer.

Remember that the entry steps are like any other stairs. Use the same caution when going in and out of your trailer that you would on any other stairway. Always use the entry assist bar/grab handle.

The steps may be hot, wet, slippery, dirty or in some other condition that may be potentially hazardous. Check the condition of the steps before entering or exiting your trailer.

There may be sharp machined edges on some parts of the step mechanism. Be careful when extending or retracting the steps. Keep your fingers and toes away from the hinge elements at the sides of the steps.

Be sure the step areas are well lit. Avoid entering or exiting the trailer at night or in conditions of poor visibility without good lighting. Turn on the porch/scare lights. Do not move the trailer with the steps extended. The step could be damaged from hitting rocks, trees, posts, etc. and may not be able to be retracted. It may also be broken in a way that is not visible and fail the next time you need to use it.

Although the steps are strong and capable of supporting normal foot traffic, they are not infinitely strong and may fail under extreme loads.

Inspect the steps before every trip. Look for cracked or bent parts or obvious damage. If any damage is found, have the step repaired before using it.

Keep the step clean. Wash off oil, grease, wax, or other slippery substances. Clean off ice and snow accumulations, and accumulations of dirt and sand.

**Maintenance Tip:** Frequently lubricate the step hinge points with spray lubricant (such as WD-40 or lithium grease) to assure smooth and easy operation.

### Preparing the Trailer For Travel

1. Pack up the trailer. As you become familiar with your traveling need, you can develop checklists to use to remind you as you pack. Be sure to follow the loading guidelines in Chapter 7.
2. Do a walk-around inside the trailer. Check these items:
  - All cabinets, doors and drawers closed tightly.
  - All interior sliding door travel locks are in place.

- Raise and lock blinds to keep them from swinging and causing damage.
- Be sure emergency escape windows are secure.
- Close and latch all windows and close roof vents.
- Secure fold-down beds/lounges and collapsible tables.
- Secure ALL loose items: bunk ladders, free-standing furniture, small appliances, food and housekeeping items, TVs and entertainment equipment, etc. Retract and lock TV attachment arms (if equipped).
- Close all drawers. Tug on them to make sure they are secure .
- Be sure all doors near slide-outs are closed.
- Move chairs or other furniture/equipment away from the walls. NOTE: If you expect to travel on bad roads, turn the dinette table over and move the chairs to the front.
- Retract all slide-outs (if equipped).
- Retract TV antenna and/or satellite dish (if equipped).
- Turn off range and oven controls and be sure all pilots are off. Close all faucets, and turn all appliance switches OFF.
- Turn off water pump.

3. Do a walk-around outside the trailer:

- Retract and lock all awnings (if equipped).
- Disconnect all electric, water and waste connections (if connected). Stow all cables and hoses.
- Close and lock all outside compartment doors (except propane compartment).
- Clear all obstacles under the trailer.
- Retract stabilizer jacks and remove and stow all portable jacks/blocks.
- Check tire pressures (see Chapter 6). Check wheel nut torque (see Chapter 6) Retract entry steps.
- Close, latch and lock rear and side cargo doors (if equipped)

- Close and lock entry door.

NOTE: Keep the trailer wheels chocked until hitching is completed.

### Hitching Up



*Never stand between the tow vehicle and the trailer. Unexpected vehicle movement could pin a person between the tow vehicle and the trailer. Failure to comply could result in serious injury or death.*

Hitching your trailer to your tow vehicle will become routine with experience. Make it a habit to examine all hitch components before hitching the trailer. If you have a conventional ball hitch, check for cracked or bent parts, cracked welds and deformed or stripped bolts. Inspect the spring bars and chains. Be sure the ball is tight and well lubricated.

Check the trailer tongue for cracks. Be sure the ball locking device works freely. Inspect the safety chains. If you find a defect in any hitch component, correct it before towing the trailer.

If you have a fifth-wheel trailer, check all truck-mounted hitch components. Check for worn, cracked, or bent parts. Be sure the locking device works properly. Inspect the pin box assembly on the trailer. Check the king pin. If you find any defective components, repair or replace them before towing. Be sure all moving parts of the hitch are well lubricated.

### Hitching Up A Fifth Wheel

#### NOTICE

*Do not attempt to raise the trailer on one landing gear only. Uneven distribution of weight on the landing gear jacks will make the trailer unstable and may damage the overloaded jack.*

1. Chock the trailer wheels so there is no wheel movement.
2. Extend the 5th-wheel landing gear legs and raise the king pin to the appropriate hitch height.
3. Lower the tow vehicle (truck) tailgate and remove any obstacles in the truck bed. Be sure the trailer king pin will clear the truck bed.

4. Open and lock the jaws of the hitch (not required on some hitches). Position the hitch level to give a clear view of the hitch and king pin.
5. Back the truck so that the king pin is directly in front of the mouth of the 5th wheel hitch. Stop and check that the tailgate will not hit the trailer and that the king pin is even with or slightly below the top of the hitch plate.
6. Lay the 7-way power cord and the breakaway switch cable over the truck to keep them clear of the truck and to make connection easier.
7. Insert the hand crank into the alignment tube until the end engages the cross shaft (manual operation). For electric drive, do not insert the crank handle.
8. Turn the crank counterclockwise (or press the switch UP) until the trailer king pin is lined up with the tow vehicle hitch.
9. Back the truck into position until the king pin locks into the hitch jaws. Some hitches require manually locking the jaws. Install all locking pins on the hitch plate lever.
10. Secure the breakaway switch cable (lanyard) to a secure attachment point on the tow vehicle. Make sure the cable is free and will not bind against the truck or any equipment in the truck bed, especially during turns. Make sure the pin in the breakaway switch is securely in place.
11. Connect the 7-way power cord to the tow vehicle receptacle.
12. Check the running lights on the trailer and tow vehicle for proper operation: brake lights, taillights, clearance lights, turn signals.
13. Raise the trailer landing gear legs an inch or two and do a short "pull test" to make sure the hitch is secure. If everything is okay, completely raise the landing gear legs.
14. Remove (or disengage) the pull pin and raise the drop tube, re-pinning it in the highest position, middle tube is halfway to the ground.
15. Fully retract the legs so that the foot pad is higher than the lowest point of the trailer, to prevent dragging.
16. Remove and stow the crank handle (manual operation).
17. Remove and stow the wheel chocks. If possible, move the rig ahead about 50 feet and test the trailer brakes and lights. Check the ground for forgotten objects.
18. Check inside the trailer to be sure that everything is stored away, vents and windows are closed, and doors and drawers are closed.
19. Be sure entry door is locked and steps are retracted.
20. Regularly check tire pressures, hub temperatures, and wheel nut torque while under way.

### Hitching Procedure for Travel Trailers

#### **NOTICE**

*If you tow using a weight distributing hitch, the spring bars **MUST** be disconnected when towing off-road. Weight distributing hitches are not designed for operation on unlevel surfaces. Failure to disconnect the spring bars when towing off-road may result in damage to the tongue of the trailer.*

#### **WARNING**

*Follow the instructions of the hitch manufacturer for adjusting the weight distributing hitch. Overtightening of hitch spring bars will reduce cornering and stopping ability as well as stability.*

Before attempting to hitch up your trailer, read the instructions provided by the manufacturer of the hitch. Your hitch must be able to accept a 2-5/16" ball. The following instructions apply in most cases. If the instructions provided with your hitch are different from these instructions, follow those of the hitch manufacturer:

1. Chock the trailer wheels so there is no wheel movement.
2. Turn the tongue jack crank clockwise. This will extend the jack and raise the tongue and coupler. Raise the tongue sufficiently to clear the hitch ball on the tow vehicle.
3. Back the tow vehicle until the hitch ball is under the hitch ball socket. If you are working alone, a backing aid mirror may be helpful.
4. The coupler latch locking lever on the tongue should be 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 or bolt.

5. Raise the tow vehicle and trailer with the tongue jack high enough to allow room to install the hitch spring bars (if using a weight distributing hitch).
6. Attach the spring bars according to the hitch manufacturer's instructions. Never attach safety chains to the hitch bar or any removable part of the hitch.
7. After adjusting the spring bars, retract the tongue jack completely. Note that the trailer must be relatively level front to back. Tilt in either direction must be kept to an absolute minimum. Having the front lower than the rear reduces towing stability on tandem axle trailers.
8. Install the sway control system according to the manufacturer's instructions (if using sway control).
9. Connect all safety chains. Safety chains are extremely important, and as a trailer owner, it is your responsibility to be familiar with these devices and their correct use. The hitch on your tow vehicle must be equipped with two chain attachment eyes, on each side of the vehicle's center line. Install the chains by threading each one through its attachment eye and hooking it back on itself. Adjust each chain length so that it is as short as possible, but still permits full "jackknife" turns without becoming tight. Both chains should be the same length and crossed under the trailer's tongue to hold the tongue off the ground if the trailer accidentally becomes uncoupled.



10. Connect the 7-way power cord to the tow vehicle receptacle and the breakaway switch lanyard to a non-removable part of the hitch or the tow vehicle chassis.

11. Check the running lights on the trailer and tow vehicle for proper operation: brake lights, taillights, clearance lights, turn signals.
12. Completely raise the coupler jack and jack wheel (if equipped). Remove foot pad from jackleg and stow.
13. Remove and stow the wheel chocks. If possible, move the rig ahead about 50 feet and test the trailer brakes and lights. Check the ground for forgotten objects.
14. Check inside the trailer to be sure that everything is stored away, vents and windows are closed, and doors and drawers are closed.
15. Be sure entry door is locked and steps are retracted.
16. Regularly check tire pressures, hub temperatures, and wheel nut torque while under way.

Simple hitching aids are available from RV accessory suppliers that make it easier to align the coupler and hitch ball without leaving the driver's seat.

### **WARNING**

*Never attach the breakaway switch lanyard to the hitch bar or any removable part of the hitch. The lanyard should only be attached to a permanent part of the hitch. This will allow the lanyard to activate the breakaway switch if the unit becomes unattached from the tow vehicle.*

### **Electrical Hookup (See Chapter 12)**

Before connecting to the electrical supply, check the supply rating. Be sure it is 110- to 125-volt single phase AC for 30-amp service or 2-phase 220 to 240-volt AC (two 110 to 120-volt legs) for 50-amp service.

1. Be sure the site power source breakers are OFF (both legs on 50-amp service).
2. If the site power source breakers are not accessible, turn OFF the main breakers inside the trailer.
3. Insert the plug of the cord into the site source receptacle, seating the connector squarely and completely.
4. Turn site source breakers ON.
5. Turn trailer main breakers ON.

To disconnect:

1. Turn trailer main breakers OFF.  
OR  
Turn site source breakers OFF.

2. Pull the plug end of the cord straight out of the source receptacle.
3. Coil and stow the shore power cord.

### Fresh Water Hookup (See Chapter 13)

The city water system is connected through a potable water hose to a hookup on the exterior wall of the trailer. Since campground water systems have varying pressures, a pressure regulator should be used to reduce the city water pressure to the trailer (see below).

To connect to the city water system:

1. Set the water pump switch to OFF.
2. Pull out the fresh water hose.
3. Turn on the site water supply and allow clean water to flow for a few seconds or until the water is clean and clear. Turn off the site supply valve and connect the fresh water hose to the supply.
4. Turn on the site supply valve.

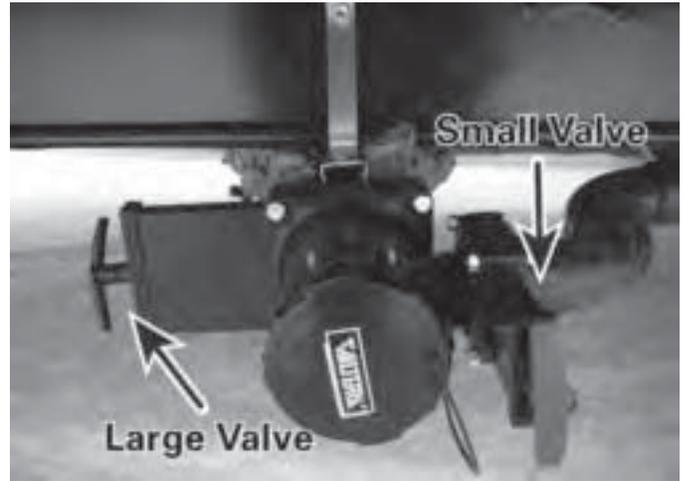
### Waste Water/Sewer Hookup (See Chapter 14)

During self-containment, the sewer line is securely capped to prevent leakage of waste material onto the ground or pavement. Do not pull the holding tank knife valves 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. If necessary, fill the tanks with water to 3/4-full. This provides sufficient depth and volume to allow complete flushing of waste material into the sewer line.

Whenever possible, drain the tanks before traveling. Waste water and sewage in the holding tanks reduce the carrying capacity of the trailer.

During extended hookups, waste materials will build up in the tank and cause serious plugging if the tank valves are left open. Keep the valves closed until the tanks are 3/4-full, then dump into the sewage system. When not connected to a sewage system, keep the protective cap in place on the drain line fitting.



To dump the holding tanks:

1. Turn the outlet cap counterclockwise to remove it.
2. Attach the sewer hose to the holding tank outlet by turning clockwise, locking the tabs on the outlet.
3. Place the other end of the sewer hose into an approved dump station inlet. Push it far enough into the opening to be secure. Adapters may be required between the line and the inlet. Arrange the hose so it slopes evenly to the sewer inlet. Avoid sharp bends.
4. Open the black tank termination valve (the larger one) and drain. Grasp the valve handle firmly and slide the valve open with a quick, steady pull. Allow enough time for the tank to drain completely. Rinse and flush the tank through the toilet. When the tank is empty, push the valve handle back in to close the valve. Run enough water (up to five gallons) into the tank to cover the bottom. This will help to break up solids and reduce the build up of solid wastes.
5. To drain the gray water tank, open the gray tank termination valve (the smaller one) and drain. Drain the gray tank last to aid in flushing the outlets and hose. When the tank is empty, push the valve handle back in to close the valve.
6. Disconnect sewer hose, reinstall termination cap on the outlet.
7. Rinse out the sewer hose with fresh water and remove the sewer hose from the dump station.
8. Replace the sewer or dump station covers, and store the sewer hose and fittings.

### Interior Set Up

1. Check the inside of the trailer for any open doors/drawers or furniture that might block the operation of the slide-outs.
2. Make sure there are no obstacles on the outside and extend the slide-outs (if equipped).
3. If not connected to city water, turn the water pump switch on the monitor panel to ON. Open both hot and cold faucets to bleed air from the lines. Make sure water heater is full and turn on the water heater.



4. Make sure oven and range controls are off. Open the propane gas main valve.
5. Operate the appliances as desired.
6. When TVs are positioned as desired, it's a good idea to replace the restraining cable/strap/pin (as equipped). In case of any accidental trailer movement, this will help keep TVs from falling, swinging or otherwise moving and causing damage or injury.

### Before You Leave Your Site

- Make sure all cabinets are closed, travel locks are in place, and interior doors and drawers are closed.

- Shut off range and oven controls and shut off oven pilot.
- Shut off all vents and fans and close vents.
- Shut off fresh water pump.
- Turn off climate control system.
- Shut off water heater.
- Shut off all appliances and interior lights.
- Retract TV antenna.
- Retract awnings and set travel locks.
- Position furniture to prevent damage from retraction of the slide-outs. Retract slide-outs.
- Position and stow all loose-loaded items such as furniture, TVs, electronic devices and components, food, tools, supplies, etc.
- Raise and lock all blinds.
- Close all propane gas cylinder main valve(s).
- If connected, turn off the site circuit breakers. Disconnect the shore power cord and stow it in the compartment.
- Drain the waste holding tanks. Always wear latex gloves to protect your hands while handling the waste system. If you are not situated at a site with sewer connections, drive the trailer to a dump facility and dump the tanks.
- If connected, turn off the site water valve. Loosen the water connector at the supply valve to reduce pressure, then disconnect the hose pressure regulator from the valve. Disconnect the hose from the city water inlet on the trailer. Coil and store the water hose.
- Retract the entry steps.
- Check the roof and under the trailer for any obstructions. Check the campsite for any forgotten items and for obstacles before moving the trailer.
- Close and lock exterior compartment doors, and entry door. Give them a tug to be sure.
- Hitch up the trailer as outlined in "Hitching Up" section.
- Check trailer wheel nut torque, and adjust if necessary.

## 11. DC Electrical System

### **! WARNING**

*Disconnect all electrical power, both 120-volt AC and 12-volt DC systems, before working on the electrical systems. Make sure all accessories are off so you don't cause a spark. Failure to follow these directives could lead to fire and/or personal injury.*

The trailer 12-volt DC system includes components that operate on electrical power from the tow vehicle engine alternator, a converter/charger, or the trailer battery(s). "House" electrical components such as the lights and water pump are supplied by the house battery bank. The house battery bank may consist of only one battery or several batteries connected together. The converter/ charger charges the batteries when the trailer is connected to 120-volt ("shore") power or when the generator (if equipped) is running. The tow vehicle engine alternator also charges the trailer battery while the tow vehicle engine is running and the 7-way cord is connected.

Power for the trailer exterior 12-volt DC system is provided by the tow vehicle through the 7-way power cord. This system powers the trailer running lights, brake lights, turn signals, backup lights (if equipped), and brakes. The 7-way power cord also provides a common ground and a 12-volt charge line from the tow vehicle alternator to charge the trailer batteries.

### **NOTE**

*The 12-volt battery is not supplied with the trailer by Dutchmen. You must purchase the battery separately.*

The trailer interior 12-volt DC system operates 12-volt motors, pumps, 12-volt appliances, interior lighting, landing gear, furnace, slide-outs, etc. The batteries also provide power to the breakaway switch to apply the trailer brakes if the trailer ever becomes uncoupled from the tow vehicle.

Power from the batteries, tow vehicle alternator and/or converter is routed to the main fuse panel. From the main fuse panel, power is supplied to the various circuits in the trailer. The circuits are listed on a label attached to the 120-Volt AC circuit breakers 12-Volt DC fuses distribution panel door usually located below the refrigerator.

### **Batteries**

The batteries and charging system are the heart of the 12-volt DC system. When the trailer is not connected to shore power, or if the generator (if equipped) is not running, most power needs are supplied by the batteries. If the batteries are low, all sorts of problems can occur. It is very important to maintain the batteries in a full state of charge or monitor their charge state. The converter/ charger system will help you manage your electrical power distribution.

Converter/charger/distribution panel location and configuration may differ according to model/floorplan requirements and charging needs. When the trailer is not connected to shore power or you are not running the generator (if equipped), be energy efficient. Turn off lights and appliances when they are not being used. Later in this chapter we'll discuss power management and give you some worksheets and charts to help you manage your 12- volt power needs.

### **! WARNING**

*Do not install fuses with amperage ratings greater than that specified on the fuse panel or fuse holder label. Higher amperage fuses could allow the wiring to overload causing fire and/or personal injury.*



Under low voltage, fuses and circuit breakers can blow without a short circuit condition. The refrigerator control system requires at least 10.5 volts and will shut down even with propane supplied, potentially ruining food in the refrigerator.

Never completely discharge the batteries, and maintain the electrolyte level in each battery cell at the proper level. Permanent damage may occur from using or

charging a battery with a low electrolyte level. Add only distilled water to the proper level.

Low battery charge or bad batteries are the most common cause of poor performance of slide-out rooms, appliances and other components connected to the 12-volt DC electrical system. Low voltage can also cause the furnace fan to run too slowly to operate an internal switch controlling the furnace gas valve. This will shut the furnace down. Learn to conserve your battery power. The power use chart at the end of this chapter can help you determine your power needs. To help insure that you don't have a battery failure, have your batteries checked and serviced regularly.

Avoid running down the batteries completely. The breakaway braking system depends on the 12-volt power from the trailer battery bank.

If the batteries become discharged quickly (high current use over a short period of time), a high amperage charge rate can be used to quickly recharge them. Disconnect batteries before high-amperage charging.

### Battery Installation

Your trailer is designed for dual batteries for extra power. If you connect more than one 12-volt battery, they must always be connected in parallel. Do not connect the batteries in series. This will result in 24-volt output and cause damage to equipment designed for 12-volt use.

The way that batteries are installed in your coach is critical. Improperly installed batteries create the potential for serious injury. Although Dutchmen does not provide batteries, here are guidelines for their proper installation:

Batteries should be installed in a protective "battery box" or tray. This reduces the possibility of accidental contact with the battery terminals and contains any leakage of battery acid.

You can operate your trailer with either single or dual batteries. In either case, we recommend deep cycle batteries, typically Group 24 or better.

Always install multiple 12-volt batteries in parallel or 6-volt in series/parallel. Route cables carefully to avoid pinching the cables after installation. Pinching the cables may damage the cable insulation and lead to a short.

Remove the batteries from the trailer before recharging them with an accessory battery charger.

### Battery Monitor



The monitor panel provides an effective way to keep an eye on your battery bank. To check the battery charge, press the CHARGE button. Indicators show the charge level in the batteries. Disconnect the shore power source when checking the battery condition. If the batteries become drained over an extended period of time, a low charge rate over a long period of time works best to recharge them. The converter/charger will automatically charge the batteries at the proper rate when you are connected to shore power or running the generator (if equipped).

### Battery Disconnect (If Equipped)



Some accessories or equipment in the trailer may draw small amounts of current even when turned OFF. A battery disconnect (or "load disconnect") system allows you to disconnect the house batteries. Disconnecting

the batteries will help reduce the possibility of battery discharge over long storage periods.

The battery disconnect switch (optional on some models) may be either a rotary or push-pull type. Push-pull types will be located near the 12-volt fuse panel/ converter, or near the battery in an exterior compartment. The rotary type will be mounted near the battery or in the front “pass-through” storage compartment. If you expect to store the trailer for more than 10 days, turn the knob to OPEN or pull the switch knob out. Remember to close it when you take the trailer out of storage.

### Servicing Batteries

#### **WARNING**

- *When checking or filling the electrolyte level in the batteries, 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 damage to the trailer. Wear complete eye protection and clothing protection when working with batteries. Avoid touching your eyes while working near batteries.*
- *Do not smoke, have an open flame, or generate sparks near batteries that are being charged or that have recently been charged. Gases from the battery could explode.*
- *When working around a battery, remove rings, metal watchbands, and other metal jewelry. Be careful when using tools. A short circuit across the battery terminals could cause injury, explosion or fire. Lead-acid batteries produce a short circuit current high enough to weld metal to skin, causing a severe burn.*

### Battery Inspection and Care

Check the condition of the batteries at least monthly. Check for cracks in the cover and case. Check vent plugs and replace them if they are cracked or broken. Make sure the hold-down hardware is tight to prevent the batteries from shaking. Make sure the battery tray or compartment is clean and free of corrosion. Do not store anything in the compartment or tray which could cause a short circuit across the terminals of the batteries.

To clean the batteries:

1. Be sure the vent caps are installed and tight.

2. Wash the batteries with a diluted solution of baking soda and water to neutralize any acid present. Gently rinse the batteries with clean water.

#### **NOTE**

*Foaming around the terminals or on top of the batteries is normal acid neutralization. Avoid getting the solution in the battery.*

3. Dry the cables and terminals before reinstalling them
4. Clean the terminals and the the cable ends with a brush.
5. Reinstall the cables and use a plastic ignition protective spray to protect the terminals. Do not use grease on the terminal or cable bare metal. Grease is an insulator.

### Batteries and Battery Charging

Most of the time you will use your trailer under three different conditions: dry camping, driving, or connected to shore power.

#### Dry Camping

You will be using power from the batteries to operate lights, fans and other DC components as listed on the power use charts. You will be discharging the batteries at a rate dependent on what systems are operating.

#### While Driving

Under driving conditions, or with the tow vehicle engine running, your batteries will be charged by the tow vehicle engine alternator. If the 7-way plug is connected, this is a “trickle charge” only.

#### Connected to Shore Power

When you are connected to shore power or when the generator (if equipped) is running, all batteries will be charged automatically by the converter/charger.

It is very important to understand that the difference between a fully charged battery and a fully discharged one is only about 1 volt. A fully charged battery at rest, in which no discharging or recharging has occurred for 24 hours has a voltage of 12.63 volts (at 77 degrees F.). A completely discharged battery has a voltage of 11.82 volts. Don't be fooled by voltage readings — a battery that measures 12 volts is already 75% discharged.

If you experience dead batteries:

1. Plug in to shore power if available, or start and run the generator (if equipped).
2. Reduce the loads on the batteries by turning off any lights, fans, or other 12-volt DC powered equipment that is not absolutely necessary. Avoid turning off the refrigerator. You must reduce loads as much as possible for charging to take place. Run the generator while monitoring the battery charge status indicator on the monitor panel. Running the generator will supply AC current to the converter/charger system, thus charging the batteries.
3. Connect the 7-way cord to your tow vehicle and run the engine at high idle to increase charging current and reduce charging time. Keep loads reduced until batteries are fully charged.

If your tow vehicle battery is dead or discharged, and the generator will not start, an external jumper battery or battery charger must be used to either start your tow vehicle engine or the generator. You may also connect to available shore power to operate the converter/charger system to charge the batteries.

### **WARNING**

*Make sure the area around the battery is well ventilated. Have someone within range of your voice or close enough to come to your aid when you work near a lead-acid battery. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flood it with running cold water for at least twenty minutes and get immediate medical attention.*

#### **Tips For Dead Batteries:**

Dead batteries raise a lot of questions, and in most cases are the result of owners misunderstanding their use, maintenance and capabilities.

Compartment, patio and bathroom lights left on are common causes of battery drain. If you are going to park the trailer for a period of time, plug in to shore power to insure the batteries are topped up prior to your next use. Check the batteries while the trailer is plugged in to make sure they are not overcharged or the electrolyte has not evaporated out. Battery failures caused by lack of water are not covered under the battery warranty.

In most refrigerators there is a “humidity control” switch, usually just inside the door. Be sure it is off when you leave your trailer as this one function can draw down your battery quickly.

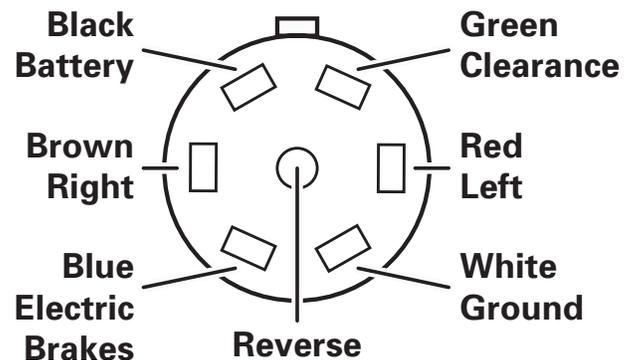
Furnace and vent fans are one of the most common and significant power draws in your trailer. If you leave a furnace or vent fan on all night, your battery will be nearly completely drained by morning.

#### **7-Way Power Cord**

The power cord circuits are protected by automotive type auto-reset circuit breakers mounted on a panel either in a forward compartment or under the front of the trailer on the chassis frame rail (A-frame or first cross member).



Be careful to prevent damage to the 7-way cord. When hitching and unhitching, make sure the cord is out of the way and cannot be damaged by the hitch and/or pin box. Do not allow the cord to drag on the ground. When not in use, cover the cord connector to prevent moisture from entering the connector. Clean the contacts in the cord with a contact cleaner every six months.



No.	Color	Item
1	White	Common Ground
2	Blue	Electric Brake
3	Green	Tail Lights and Clearance
4	Black	Battery Charge
5	Red	Left Stop and Turn
6	Brown	Right Stop and Turn
7	Yellow	Reverse (if equipped)

### Power Worksheets

The following chart illustrates various combinations of power service and converters. The maximum available power to your RV depends on both the electrical service you connect to and the output capability of the converter installed in your trailer. NOTE: You do not have the total output current (amps) available when operating on 120-volt AC service. The service input current is also “converting” to DC and therefore not all current is available for the trailer AC circuits.

To find out how much power capacity your trailer has, select the type of service (30-amp or 50-amp) then locate the type of power converter (32-amp or 45-amp) and then match the system voltage. The amperage shown is the total amount of amps that you can use at a single time.

The worksheet on the next page lists the typical power usage for many recreational vehicle appliances. Write in any appliances or components you have that are not listed. Then add up the amperage for the appliances you would like to run, and then check the table below. If the total amount exceeds the available amount listed on the chart, you cannot use all of those appliances at the same time.

12-Volt Appliance	Current Draw in AMPS
Radio	.5 - 6.0
Range Hood Fan	1.75
Power Roof Vent	1.5
Water Pump	4.0 - 8.0
A/C Circuitry	1.5
Furnace	4.0 - 6.0
CD Player	.5 - 1.0
Refrigerator	3.0
TV Booster	3.0 - 11.0
Trailer Lights	.69
Water Heater	1.0
Inverter (if installed):	
Other:	
Other:	
<i>DC Current Draw:</i>	

Appliance	Amperage Consumed
Roof Air Conditioner (Continuous)	13 - 15,
Electric water Heater	10
Microwave	10
Converter 55 Amp Output	5 - 13
Space Heater	10-15
Washer/Dryer	10
Refrigerator	3-4
TV orVCR	1
Hair Dryer	9
110 Volt Light	1
Curling Iron	3-4
Toaster (2 slice)	7 - 13
Coffee Maker	7
<i>AC Current Draw:</i>	

### NOTE

*Water heaters and refrigerators may require both 12-volt DC and 120-volt AC power depending upon the ignition configuration.*

## 12. 120 Volt AC System

The 120-volt AC system in your trailer is similar to that in your home. The system also charges the batteries through the converter/charger. 120-volt AC power is supplied to the load center from either the generator (if equipped) when “dry camping” or through the shore power cord when plugged into campground power.

### Load Center Circuit Breakers

Circuit breakers for the 120-volt system are usually located under the refrigerator either combined in the converter/charger panel or on a separate panel. The location may vary depending on model and floor plan.

AC current from the power source or the generator is routed to the main circuit breakers in the distribution panel. The current is then distributed to the other circuits through individual circuit breakers. The circuit breakers open the circuits if the rated current is exceeded. Never substitute a circuit breaker with a higher value than the original breaker installed.

### Main Converter/Charger

#### **CAUTION**

*When packing the trailer, be sure to leave clearance around the converter for adequate ventilation. Overheating of the converter can damage the appliance and could be a source of fire.*

#### **NOTICE**

*Always turn off the main circuit breakers before plugging into the site receptacle. If the power conductors (“hot” legs) make contact before the neutral, unbalanced voltage can damage electronic devices connected to the electrical system.*



Your trailer is supplied with a converter. The converter converts 120-volt AC current to 12-volt DC. It provides DC power to operate the DC electrical system and charge the batteries.

Power is supplied whenever the trailer is connected to shore power or the generator is running. Some converters include a cooling fan that will come on when certain temperatures are reached. You may occasionally hear this fan running if outdoor temperatures are high or the DC load is high.

**Ground Fault Circuit Interrupter (GFCI)****NOTE**

*If bath, galley, or exterior outlets don't work, check the bath GFCI. Reset it if necessary. If it continues to trip, have the electrical system checked by a qualified electrician.*

The receptacles in the bathroom, galley and exterior are protected by the GFCI. This device provides ground fault protection from potential electrical shock hazards of line to ground electric faults and electrical leakage shocks possible when using appliances in damp areas. The GFCI disconnects the circuit (and other outlets on the same circuit) whenever a ground fault is detected, 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 circuit overloads.

Test the GFCI breaker each month while operating on 120-volt AC power. To test the GFCI:

1. Press the TEST button on the GFCI outlet. 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 pressed, ground fault protection on the protected circuit has been lost. Do not use the outlet or other outlets on the same circuit. Have the trailer electrical system checked by your dealer or a qualified electrician. Do not use the system until the problem has been corrected.
3. Press the RESET button to reset the GFCI and restore power to the protected circuit.

**Power "Shore" Cord**

Your trailer is equipped with a heavy duty power cord to connect to an external 120-volt 30- or 50-amp (depending on model) rated AC service. The cord and plug are a molded, weatherproof assembly. The cord provides a correct ground connection to the site service. Do not alter or cut the cord in any way. Do not remove the ground pin from the 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 through the adapter.


**WARNING**

*Never use a two-conductor extension cord, or any cord that does not assure correct and adequate ground continuity. Never plug the 120-volt cord into an ungrounded receptacle. Failure to follow these directions can lead to fire and/or personal injury.*

Depending on model, the power cord is either wired permanently to the trailer electrical system, or is removable. Removable cords attach to the trailer inlet with a twist lock connector and locking ring. When attaching the cord to the trailer, be sure to align the pins correctly before locking the cord in place. The locking ring provides extra strain relief and a weather-resistant seal.



When connecting the cord to the service, push the plug straight into the receptacle until it seats completely.

### Electrical Hookup

Before connecting to the electrical supply, check the supply rating. Be sure it is 110-volt to 125-volt single phase AC for 30-amp service or 2-phase 220 to 240-volt AC (two 110 to 120-volt legs) for 50-amp service.

### Connecting to Shore Power

1. Be sure the site power source breakers are OFF (both legs on 50-amp service).
2. If the site power source breakers are not accessible, turn OFF the main breakers inside the trailer.
3. Insert the plug of the cord into the site source receptacle, seating the connector squarely and completely.
4. Turn site source breakers ON.
5. Turn trailer main breakers ON.

To disconnect:

1. Turn trailer main breakers OFF.  
OR  
Turn site source breakers OFF.
2. Pull the plug end of the cord straight out of the source receptable.
3. Coil and stow the shore power cord.

### Generator (If Equipped)

#### **! WARNING**

*Do not modify the generator installation or exhaust in any way. Modification could allow carbon monoxide into the RV. Carbon monoxide is deadly. Protect yourself by inspecting exhaust for damage prior to operation.*

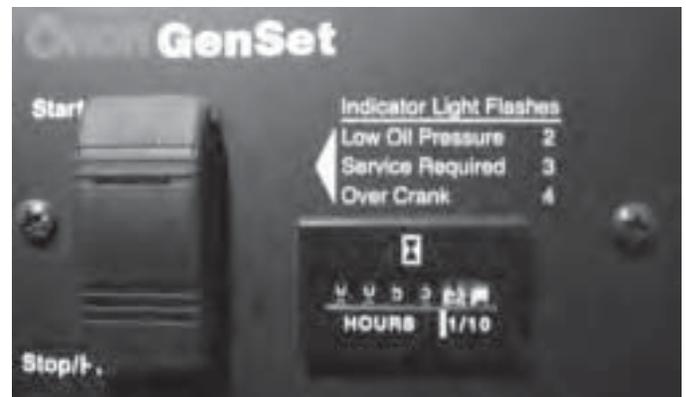
#### **! WARNING**

*Do not place flammable material or store any other materials in the generator compartment. Heat from the generator or generator exhaust may cause this material to ignite.*

The generator will provide 120-volt AC power when shore power is not available. It can be controlled both at the generator and from the remote START/STOP controls located inside the trailer. **IMPORTANT: BE SURE TO READ AND UNDERSTAND THE GENERATOR OPERATOR'S MANUAL BEFORE OPERATING THE GENERATOR.** Observe all operating instructions and warnings as well as all recommended maintenance schedules and procedures.

Depending on model, the output of the generator is connected to the trailer AC electrical system automatically through a transfer switch in the converter when the generator is started. Power is routed through the load center main breakers.

### Generator Control Panel Operation



See the generator Operating Guide in your Owner's Package for complete operating and maintenance instructions. The generator control panel features:

**Hourmeter** - Indicates total generator operating time in hours and tenths of hours. Use the hourmeter with the generator maintenance schedule for periodic maintenance.

START/STOP switch - First, “prime” the motor by pressing the switch in the STOP/PRIME position. HOLD until the light stops flashing. The motor is now primed. To start the generator, press and hold at the RUN position. Release the switch when the engine starts (the GEN RUN lamp will come on). To stop the generator, hold the switch at the STOP position until the engine stops.

Every time before starting the generator:

- Check the fuel level in the fuel tank. Check the oil level.
  - Check all fuel lines for fuel leaks.
  - Inspect generator for loose or damaged components and fasteners.
  - Correct any problems before operating the generator. Inspect the generator exhaust system for damage or leaks. Be sure the exhaust pipe is clear of walls, snow banks or any obstruction that would prevent exhaust gases from dissipating.
  - Be sure the trailer is not parked in high grass or brush. Set the main circuit breakers to OFF.
  - Connect the shore power cord to the shore power receptacle.
1. Press and hold the START/STOP switch in the STOP/PRIME position at either control panel until the red light stops flashing; then hold the switch in the START position until the generator starts. The indicator light will remain on after the switch is released.
  2. If the generator does not start, release the switch. Wait two minutes and try again (priming first). If the second try does not start the generator, try starting using the START/STOP on the generator control panel. If the indicator light still does not light, there may be an open in the remote wiring. Contact a service center for assistance.
  3. Do not turn on the main breakers until the generator is running smoothly and is warmed up. Check that there are no fuel or exhaust leaks.
  4. Turn off the individual breakers, and set the main breakers ON. Turn on the individual circuit breakers one at a time to prevent generator overloading.
  5. To stop the generator, turn off the main breakers. Let the generator run three to five minutes to cool down. Press and hold the START/STOP switch

to the STOP position until the generator stops completely and the indicator light goes out. If the switch is released before the generator stops and the light goes out, the generator will continue to run.

## NOTE



*The output from the generator may be interrupted if the main generator circuit breakers trip. These breakers are located on the main generator control panel. If there is no power when the generator is running, check and reset these breakers.*

## NOTE

*If you store your RV over the winter, or don't operate it often enough to refuel the gas tank every month, a fuel varnishing problem could develop in your generator engine and fuel system.*

Fuel varnish is a gummy residue that clogs the generator carburetor and fuel pump and is caused by the deterioration of fuel. Depending on fuel quality and storage conditions, gasoline can deteriorate in as little as 30 days. As long as you refuel frequently with fresh gasoline, and exercise the unit regularly, fuel varnishing is less likely to occur. But if you leave the same gasoline in the tank for several months, you're very likely to have problems.

The only way to prevent fuel varnishing is to add a fuel preservative to the fuel (gasoline) tank and to run the generator.

For more information, see the Onan generator operating and maintenance manual.

## DANGER

*CARBON MONOXIDE IS POISONOUS AND CAN CAUSE UNCONSCIOUSNESS AND DEATH.*

## **WARNING**

*Do not under any circumstances operate the generator while you are sleeping. You would not be able to monitor outside conditions to assure that engine exhaust gases are being safely dissipated, and is not entering the trailer interior. You would not be alert to exhaust odors or the symptoms of carbon monoxide poisoning.*

### **Generator Operating Safety Precautions**

The generator produces carbon monoxide while it is running. Carbon monoxide is a colorless, tasteless, odorless gas. CARBON MONOXIDE IS DEADLY. Before you start and use the generator, inspect the exhaust system. Do not use the generator if the exhaust system is damaged. Test the carbon monoxide detector every time you use the RV. To protect yourself from the effects of carbon monoxide poisoning, please read and understand the following precautions.

There are a number of symptoms of carbon monoxide poisoning:

Dizziness, Intense headache, Throbbing in temples, Nausea, Vomiting, Muscular twitching, Weakness/sleepiness, Inability to think clearly

If you or others (including pets) experience any of these symptoms, get out into fresh air immediately. Get medical attention if any of the symptoms persist. Turn the generator off and do not operate it until it has been inspected and repaired by a generator repair facility.

Review the safety precautions for fuel and exhaust fumes elsewhere in this manual.

- **DO NOT** operate the generator if exhaust gases cannot be discharged away from the trailer or other vehicles. Do not block the exhaust pipe. Do not park the trailer where the exhaust gases can accumulate either outside, underneath, or inside the trailer or other vehicles. Make sure exhaust gases are clear of walls, snow banks or any obstructions that can prevent exhaust gases from dissipating.
- **DO NOT** operate the generator while sleeping. You would not be aware of exhaust entering the trailer, or alert to symptoms of carbon monoxide poisoning.
- **DO NOT** operate the generator in an enclosed building or in a partly enclosed area such as a garage.

- **DO NOT** operate the generator when the trailer is parked in high grass or brush. Heat from the exhaust could cause a fire in dry conditions.
- **DO NOT** operate the generator when parked in close proximity to vegetation, snow, buildings, vehicles, or any other object could deflect the exhaust under or into the vehicle.
- **DO NOT** simultaneously operate the generator and a powered ventilator which could result in the entry of exhaust gas. When exhaust ventilators are used, open a window on the opposite side of the trailer upwind of exhaust gases to provide cross ventilation.

When parked, position the vehicle so that the wind will carry the exhaust away from the vehicle.

- **DO NOT** open nearby windows, ventilators, or doors into the passenger compartment, especially those downwind, even part of the time.

Never operate your tow vehicle or generator engine longer than necessary when parked.

- **DO NOT** fill the fuel tank while the generator is running. Fuel contact with the hot generator or exhaust is a fire hazard.
- **DO NOT** smoke or have an open flame near the generator or fuel tank.

Never store anything in the generator compartment. Always keep the compartment clean and dry.

- **DO NOT** start the generator while a load is connected. Make sure the MAIN circuit breakers are OFF before starting.

Disconnect the generator from the battery before performing any generator maintenance.

- **DO NOT** touch the generator while it is running, or immediately after turning it off. Heat from the generator can cause burns. Allow the generator to cool before attempting maintenance or service.

## **NOTE**

*During long periods of in-operation, or if the engine does not reach operating temperature, moisture can condense in the engine making starting difficult and causing damage to the engine. Operate the generator with a 50% capacity load for two hours once a month. A long exercise period that allows normal operating temperatures is preferable to short periods.*

 **WARNING**

*Do not block the generator ventilating air inlets or outlets. Restricting ventilating air inlets or outlets can cause engine failure or fire from engine overheating.*

**Generator Maintenance**

Details of service and maintenance are in the generator Operator's Guide in your Owner's Package.

## 13. Fresh Water System

Your trailer is equipped with a dual fresh water system. The demand fresh water system operates from the trailer's own self-contained supply tank and water pump. A monitor panel indicates the water level in the fresh water tank. The "city water" hookup allows you to connect to a pressurized external system at a campground.

Fresh water for self-contained use is stored in a plastic tank located below the floor of the trailer. The tank is vented to allow proper and complete filling. This vent must remain open. The monitor panel level sensors are mounted in the tank, and a drain valve allows you to drain the tank. Always drain the tank before storing the trailer for long periods. When the trailer is in use, drain and clean the tank every month or so. The entire fresh water system should be sanitized before the first use, after a period of non use, or if the system becomes contaminated. Sanitation and routine tank maintenance are covered later in this manual.

The easiest way to keep the tank full of clean water is to start with a dedicated, clean drinking water hose and an inline filter system. These two items are not included with your trailer.

Non-toxic, FDA-approved drinking water hoses are inexpensive and yield no taste or no odor to the water. They are usually white in color with a light blue stripe. This helps identify the hose and reminds you to keep it separate from other hoses, especially any hose, fittings or other hardware you use for waste drainage. You should consider using a special FDA-approved hose because many common garden hoses are made of re-ground rubber or other materials. As they age and the compounds break down, they can impart taste, odor and impurities to your fresh water supply.

### **NOTICE**

*Do NOT leave hose unattended during filling of potable water. Turn water OFF immediately when tank is full. Damage may result from either overfilling or leaving hose unattended. Rapid filling of the fresh water tank may cause inadequate venting or water to escape the tank when full. Excessive pressure in the tank may cause damage to the tank, floor and underbelly of the RV.*

### **NOTE**

*The fresh water tank is mounted under the trailer to allow it to "belly down" as it is filled. It may appear to be unsupported. It is designed to be this way. If the tank is not allowed to expand downward, it will expand upward. The tank is mounted securely against the trailer floor, and if it expands upward, it may cause damage to the trailer floor, cabinetry and other components. DO NOT ADD ADDITIONAL SUPPORT MEMBERS BELOW THE FRESH WATER TANK.*

There are two things to remember about your fresh water hose: Never use it for anything except filling the freshwater tank or connecting to city water, and always store it away from all other assorted hoses and plumbing supplies. Second, if possible, nothing should go through that hose unless it goes through an in-line filter first.

### **Filling The Fresh Water Tank**



### **NOTE**

*Before filling the water tank, be sure the water supply is "potable", that is, drinking quality. Not all water supplies may be drinking quality. Water quality and contamination issues are discussed later in this chapter.*

The gravity water tank fill inlet is not designed or intended for fast tank filling under pressure. The volume of air in the tank must be allowed to escape at the same rate the water is entering the tank. Sometimes filling too fast causes a back flow of water through the fill tube because the air in the system can't escape as fast as the water is coming in.

If you fill the tank too quickly, air can be trapped in the tank. This can cause the tank to bulge beyond its limits and possibly rupture. The excessive bulging can damage the trailer floor, surrounding cabinets, and chassis structure.

Fill the tank slowly, allowing the air inside to escape through the inlet vent. It takes a little more time, but slow filling will reduce the possibility of damaged tanks, damaged floors, and gushing water. Structural damage from overfilling tanks is not covered under warranty. It is considered operator error.

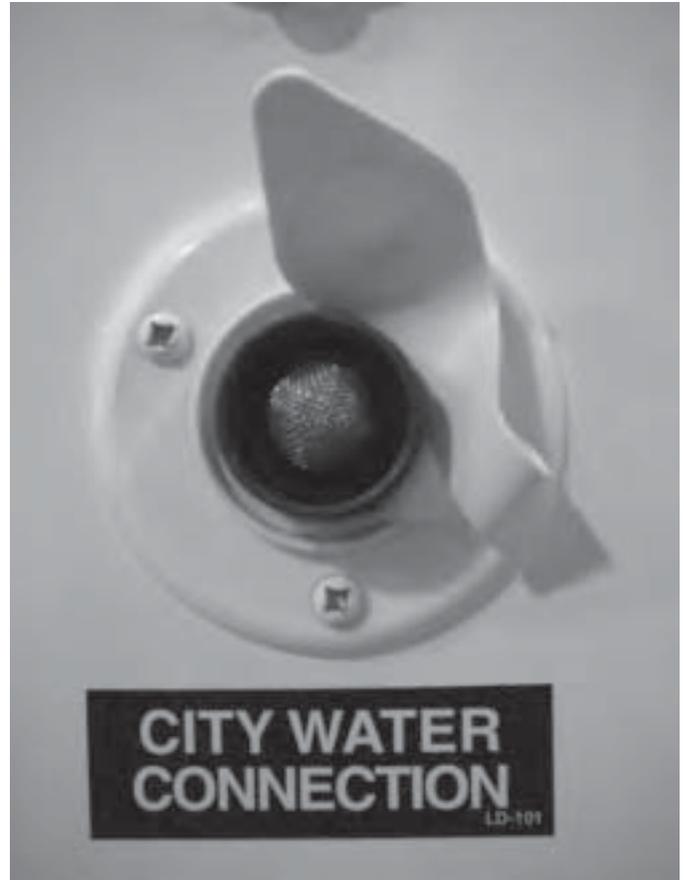
To fill the fresh water tank:

1. Remove the cap from the tank fill on the side of the trailer.  
(The tank fill may be behind a lockable door on some models.)
2. Connect one end of a potable water transfer hose to a water supply, turn on the supply and let the water run until it is clean and clear. Turn off the supply. Place the other end into the water inlet on the side of the trailer. Turn on the water supply and fill the tank until water flows out the tank vent on the side of the trailer.
3. Remove and store the hose.

### NOTE

*Fresh water is considered "cargo"; therefore your cargo carrying capacity (ccc) is reduced by the weight of water you carry.*

### Connecting to City Water



The city water system is connected through a potable water hose to a hookup on the exterior wall of the trailer. Since campground water systems have varying pressures, a pressure regulator should be used to reduce the city water pressure to the trailer. Because the connection is pressurized, there is no need to use the water pump.

To connect to the city water system:

1. Set the water pump switch to OFF.
2. Pull out the fresh water hose.
3. Turn on the site water supply and allow clean water to flow for a few seconds or until the water is clean and clear. Turn off the site supply valve and connect the fresh water hose to the supply.
4. Turn on the site supply valve.

### Pressure Regulators and Check Valves

Water pressure will frequently vary from location to location and too much pressure can damage your plumbing system and components. Always keep a water pressure regulator in the freshwater storage box and use it whenever you hook up to city/campground water.

A number of reasonably priced, inline regulators are available.

The majority of these regulators are set to limit the pressure to the RV to 45 psi. Adjustable regulators are also available that allow you adjust the pressure and flow for your specific needs.

A check valve built into the water pump prevents city water from flowing into the fresh water tank. A check valve is also located at the city water inlet to prevent water pressurized by the water pump from flowing from the city water inlet.

## NOTICE

*Whenever you leave the trailer for a period of time, turn off the water pump and/ or shut off the city water supply. A sudden leak in the water system will allow the water system to run and flood the trailer.*

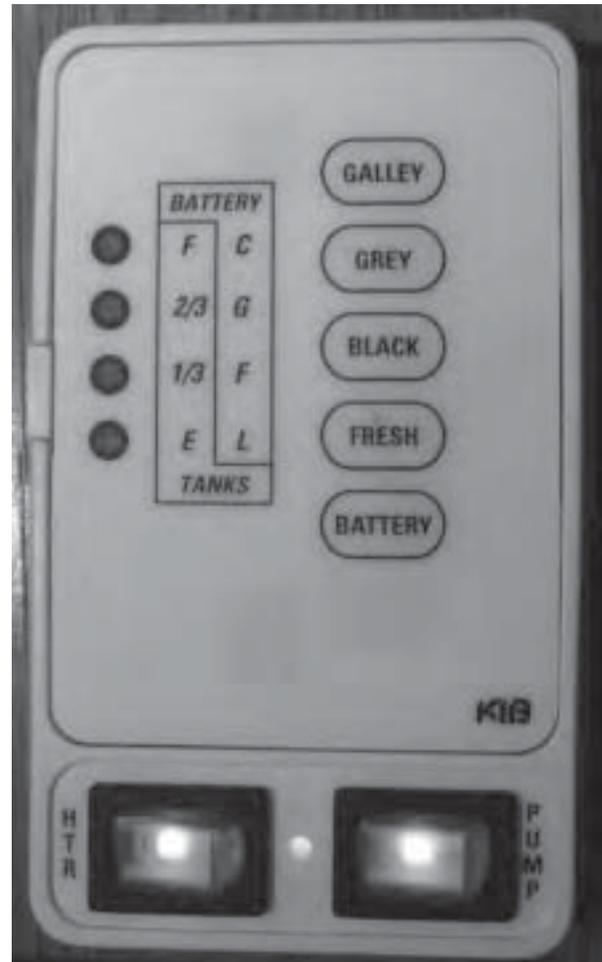
*Turn off the water pump while traveling. A faucet may come open while traveling and all your fresh water could be pumped out. If you leave a sink drain plugged, the sink will overflow causing the interior of the trailer to be flooded.*

### Water Pump



The water pump is a demand type pump that runs when a pressure drop in the water lines is detected, such as when a faucet is opened. The pump will continue to run until the faucet is closed and the pressure

is restored. It is self-priming and can pump a constant rate of approximately 2.8 gallons per minute at approximately 40- 45 psi. A switch for the water pump is located on the monitor panel, and an indicator light on the panel shows that the pump is operational.



Location and installation may differ depending on model and floorplan.

## NOTICE

*Never let the water pump run while fresh water tank is empty; damage to the pump and/or circuit may occur.*

A transparent water strainer is installed on the supply side of the water pump. This strainer helps to filter out large particles that might be in the fresh water supply. It does not filter out bacteria or chemical pollutants in the water. The strainer requires periodic cleaning. See Plumbing System Maintenance section in the “Care and Maintenance” chapter.

To help speed priming after the fresh water tank has been emptied:

1. Fill the fresh water tank.

2. Turn on the water pump switch. Open all faucets, both hot and cold. Allow time for the water heater to fill. Turn off each faucet as the water flow becomes steady and free of air.
3. When the water heater tank is full and all air is expelled from the system, close all faucets. The water pump should stop running. The system is now ready for use.

### Sanitizing The Fresh Water Tank And System

For RV'ers who consume water from their RV tanks, the most important fact to remember is that potable water doesn't stay potable for long. Even though you may be completely confident in your water supply, by the time city water reaches the tap, the chlorine level is already reduced. Air, heat and the sloshing of the water will quickly dissipate the remaining chlorine. Any micro-organisms that the chlorine had inhibited but not killed will now become active. This new growth of micro-organisms will render the water unpalatable and perhaps un-potable, producing slime and algae in the tank and lines.

To prevent this problem, you as an RV owner must maintain a safe system, treat the water that is stored in your holding tank and consider installing a water purification system.

### How to Maintain Your System

There are two sanitation procedures that you need to learn and use. One can be considered a "shock" treatment for serious contamination and before you use the system for the first time, and the other is for routine maintenance to keep the system fresh during your normal travels. We'll cover the "shock" treatment in the Care and Maintenance chapter.

Routine tank sanitation:

1. Drain the water tank completely, then refill half-way with clean, fresh water.
2. Mix 1/6-cup of regular chlorine bleach (not fragrant) for every 15 gallons of tank capacity into a container filled with a gallon or two of clean water.
3. Pour this mixture into the water tank.
4. Top off the water tank with fresh water. Drive the trailer around the block a couple of times to mix the solution.

5. Pump about a quart of water through each faucet so that all the lines are filled with the water/bleach mixture from the tank.
6. Because the hot water tank holds around 6 gallons of water, run the hot water faucets until this much of the water/bleach solution has passed to ensure that the old water has been purged from the tank and replaced by the new solution.
7. Let the water stand in the system for three to six hours.
8. Drain the entire water system, hot water tank included.
9. To remove the bleach odor, mix a cup of baking soda with a gallon of water and pour into the fresh water tank.
10. Fill the tank completely and pump this solution through the water heater and the rest of the water lines as in step 5. Let this solution sit in the system for a few days to neutralize the odor.
11. Drain the entire system and refill with fresh, clean water.

### Fresh Water Filter Systems



Many water filters are designed to remove sediment and particles from the water. Removing sediment and

particles can help reduce the cloudiness of the water. You can also purchase filters that will help remove odors and improve the taste of the water. Over time these filters will eventually become clogged with filtered sediment and must be replaced. When you notice reduced flow and decreased water pressure, it is time to replace the filter. Availability depends on model and floor plan.

There are also filters that will reduce chemicals, bacteria, viruses, and various other organic impurities that can cause sickness. These filters are usually installed at the galley faucets or at a special filtered water faucet for drinking/cooking water only. If you will be traveling in places where the water supply is questionable, you might consider a filter system with these capabilities. Your dealer can advise you on specific filter systems for your needs.

### **Dealing With Water Contamination**

Water contamination creates a challenge for RV'ers. Not only must RV'ers draw water from unfamiliar sources, they must deal with what can happen to the water once it's inside the holding tank and plumbing.

You can reduce health risks by following a few common sense precautions. You might also consider using water purification equipment.

### **At The Campground**

Always connect to a water supply of known quality. If water is being delivered as potable, it has probably been tested. Many campgrounds operate from their own wells which should be tested and labeled as approved. Since you may not be able to determine when the water was last tested and since contamination can show up at any time, always be on guard.

### **In The Great Outdoors**

Drinking from any non-treated source such as a lake, pond or cool mountain stream is risky. Although mountain water rushes over rocks, gravel and sand, most harmful contaminants are still in the water. There is also the possibility that you are downstream from a dead animal, animal or even human waste.

### **Micro-organisms**

The most formidable villains are microbes and cysts which includes bacteria, viruses, protozoa and fungi. Not all microbes are harmful to man, but those that

are can be serious. Among these are the viruses that cause infectious hepatitis and the protozoans or amoebic cysts that lead to giardiasis and amoebic dysentery.

All of these contaminants can be present in any water supply that has been polluted by sewage. This is the major reason why you should keep your fresh water hose and fittings away from any hardware or supplies you use for waste system chores.

Giardiasis is caused by giardia lamblia. It infects the small intestines and causes symptoms that may include severe diarrhea, cramps, nausea, vomiting and fatigue. It has been considered the most common disease-causing intestinal parasite in North America. It resists typical chlorination and filtration procedures, and thrives in a wide range of temperatures. Giardiasis hits hardest those water systems that draw their water from mountain streams.

### **Chemical Contaminants**

The vast majority of chemical contaminants have no taste or smell and leave the water appearing clear and clean. Even well water can't always be trusted. A common belief once was that if water came from the ground, it had to be safe.

Water contamination is a serious and complex problem. By taking a few precautionary measures, you can travel and enjoy the outdoors without risking illness. As said in the beginning, the simplest first line of defense is to use only water you are reasonably certain is potable.

## 14. Waste System

The waste water system in your trailer is made up of sinks, tub, shower, toilet, plumbing drain and vent lines. Waste water from the sinks and shower is contained in a “gray water” holding tank. Toilet waste is contained in a separate “black water” holding tank. The holding tanks make the system completely self-contained allowing you to dispose of waste at your convenience. In addition, there is a dump valve for each holding tank, the toilet, “P” traps at each sink and shower drain, and an indicator on the monitor panel for each tank. Each holding tank is vented through the roof to reduce the buildup of interior odors. A flexible sewer hose and several fittings are required to connect the holding tank outlet to the inlet of an approved waste water dump station or sewer system.

The drain and waste plumbing is very similar to that used in your home. The plumbing is made of plastic, is durable and resistant to most chemicals.

### Toilet



Your trailer is equipped with a marine/RV-type toilet. It operates from water supplied either by the fresh water tank or from an exterior water supply connected at the city water hook-up. (The water pump must be turned on when utilizing the water from the fresh water tank.) The toilet flushes directly into the black water tank. Most models have pedals or hand-operated levers that operate independently. One opens a water valve to fill the bowl, the other operates the valve in the bottom of

the bowl, permitting the contents to be flushed into the black holding tank. Complete instructions and care for the model installed are located in your Owner’s Information Packet.

### Operation

1. Depress the pedal about half-way to fill the toilet bowl prior to use. Always leave water in the toilet, just like at home.
2. Depress the pedal completely to flush the contents into the holding tank. Refill the bowl about half-way after flushing.
3. When flushing the toilet, make sure all contents are flushed out. If toilet tissue gets caught between the seal and the valve, the toilet may allow odors from the holding tank into the interior of the trailer.

The water in the “P” traps also prevents odors from passing through the traps and venting into the trailer interior. Evaporation, particularly in a little used shower can make the “P” trap ineffective and allow odors to back up into the trailer interior. Make sure there is water in the traps.

### NOTE

*Do not open the holding tank dump valves unless properly connected to a sewer receptacle.*

### NOTE

*Prime the waste holding tank with an odor control chemical and one or two gallons of water at the start of each trip. Vehicle movement helps to liquefy solids for easier dumping.*

### Solid Build-Up

The most common problem associated with the waste system is solid build up. Use plenty of water when flushing the toilet, and keep the tank valves closed until ready to flush the system to reduce the risk of build up. Should you ever have a build up of solids, close the valves, fill the tanks about  $\frac{3}{4}$ -full with fresh water, drive a distance to agitate the solids and drain the tanks.

Use of a holding tank deodorizing product is also highly recommended. Many deodorizing products are available from RV dealers or wherever camping supplies are sold.

## Holding Tanks

The holding tanks provide maximum flexibility and convenience for complete self-contained operation. The tanks terminate at a three-inch drain fitting under the trailer. Each holding tank has a separate dump valve. The dump valve is a quick opening, knife-type, slide valve.

Each waste tank is made of seamless molded plastic, and will not corrode. To insure proper operation of the toilet, dump valves, monitor, and holding tanks, never flush the following items down the toilet:

- Facial and/or wet strength tissues, paper towels sanitary products (including those labeled “flushable”).
- Colored toilet paper. Use the inexpensive white toilet tissue as it dissolves easily. Biodegradable tissue is recommended and available at RV supply stores.
- Detergents, bleach, lye, petroleum products or ammonia
- Automotive antifreeze, alcohols, or acetones. Grease or oil from cooking, table scraps or other solids that may cause clogging.
- Use only potable antifreeze products, which are approved by the toilet and tank manufacturers, when winterizing the trailer.

Whenever the waste system is not connected to a sewer receptacle, the dust cap should be kept on the drain connection to prevent dust and/or dirt from entering the connection and damaging the dump valves.

See the “Care & Maintenance” chapter for more information on toilet and holding tank cleaning.

## Holding Tank Monitor



The monitor panel is designed to give approximate liquid levels of the fresh, gray and black water tanks at a given moment as well as a charge value (based on voltage) of the battery.

### Operation

Depress the button for the desired reading (tank or battery). The levels readout for the tanks will read at Empty (E), 1/3, 2/3, or Full (F). All lights will be lit when full. The battery conditions are as follows (+ or -5%):

- C Charge <12.7V
- G Good 12.1V-12.7V
- F Fair 11.6V-12.1V
- L Low 6V-11.6V

### Erroneous Readings

The monitor panel displays reading from sensors attached to the tanks. These sensors can send false readings when:

1. Water with low mineral content. Minerals in water help conduct the electrical signal to the monitor display.
2. Contamination/Residue remaining on the inside of the tanks after dumping (caused by normal use or putting grease, oils, etc. in the tanks). Refer to “Holding Tank Care” in this section for further instruction.
3. Low Battery.
4. Loose wiring connections (bad ground).

### Dumping the Holding Tanks

During self-containment, the sewer line is securely capped to prevent leakage of waste material onto the ground or pavement. Do not pull the holding tank knife valves 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. If necessary, fill the tanks with water to 3/4-full. This provides sufficient liquid to allow complete flushing of waste material into the sewer line.

Whenever possible, drain the tanks before traveling. Waste water and sewage in the holding tanks reduce the carrying capacity of the trailer, and there's no sense driving around with it.

During extended hookups, waste materials will build up in the tank and cause serious plugging if the tank valves are left open. Keep the valves closed until the tanks are 3/4-full, then dump into the sewage system. When not connected to a sewage system, keep the protective cap in place on the drain line fitting.

### NOTE

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

### ! WARNING

*Holding tanks are enclosed sewer systems and as such must be drained into an approved dump station. Both black and gray water holding tanks must be drained and thoroughly rinsed regularly to prevent accumulation of harmful or toxic materials.*

### ! WARNING

*Do not use the fresh water hose you use for filling the fresh water tank or connecting to city water to rinse the sewer hose. Harmful or toxic materials could come into contact with the fresh water hose and could contaminate the fresh water supply, tank and plumbing system. Always use a separate hose for rinsing the sewer system components.*

Please ... Practice good housekeeping when draining wastes at a campsite or disposal station. Be a good RV citizen and leave the site in good order. Leave it the way you would like to find it. Above all, do not pollute.

To dump the holding tanks:

1. Turn the outlet cap counterclockwise to remove it.
2. Attach the sewer hose to the holding tank outlet by turning counterclockwise, locking the end levers over the termination end.
3. Place the other end of the sewer hose into an approved dump station inlet. Push it far enough into the opening to be secure. Adapters may be required between the line and the inlet. Arrange the hose to it slopes evenly to the sewer inlet. Avoid sharp bends.
4. Open the black tank termination valve (the larger one) and drain. Grasp the valve handle firmly and slide the valve open with a quick, steady pull. Allow enough time for the tank to drain completely. Rinse and flush the tank through the toilet. When the tank is empty, push the valve handle back in to close the valve. Run enough water (up to five gallons) into the tank to cover the bottom. This will help to break up solids and reduce “pyramiding” of solid wastes.
5. To drain the gray water tank, open the gray tank termination valve (the smaller one) and drain.

Drain the gray tank last to aid in flushing the outlets and hose. When the tank is empty, push the valve handle back in to close the valve.

6. Disconnect sewer hose, reinstall termination cap on the outlet.
7. Rinse out the sewer hose with fresh water and remove the sewer hose from the dump station.
8. Replace the sewer or dump station covers, and store the sewer hose and fittings.

### San-T-Flush (Optional)



If equipped, the San-T-Flush kit has been installed to rinse the interior of the black tank. Similar to the water fills located on the exterior of the unit, a separate hookup is placed on the exterior.

Flush the tank after dumping by connecting the sewer hose and attaching a garden hose - not your fresh water hose - to the inlet labeled "Sewer Valve Must be Open When Using This Inlet" OR "Black Tank Flush." Open the water supply to full pressure to flush tank. When water runs clear from sewer hose, shut off water supply and disconnect garden hose from source. Do not disconnect hose from flush inlet until water has drained from system.

DO NOT leave any hose connected when not in use.

DO NOT add any check valves to this system.

### Holding Tank Care

The holding tanks are virtually trouble-free. The most common problem is also an unpleasant one — clogging. You can reduce the chance of clogging by remembering the following:

- Keep the black water tank knife valve closed. Fill the tank to at least 3/4-full before draining. Be sure to cover the tank bottom with water after draining.
- Use only toilet tissue formulated for use in septic tank or RV sewer systems.
- Use only cleaners that are approved for use in septic tank or RV sewer systems.
- Use a special holding tank deodorizer chemical approved for use in RV sewer systems. These chemicals aid the breakdown of solid wastes and make the system much more pleasant to use.
- DO NOT put facial tissue, paper, automotive anti-freeze, household toilet cleaner or sanitary napkins in the holding tanks.
- DO NOT put anything solid in either tank that could scratch or puncture the tank.
- Keep both knife valves closed and locked, and the drain cap tightly in place when on the road.

If the drain system does get clogged:

- Use a hand-operated probe to loosen stubborn accumulations.
- Seriously clogged P-traps may require disassembly. Be careful not to overtighten when reassembling.
- DO NOT use harsh household drain cleaners.
- DO NOT use motorized drain augers.

Sometimes the holding tank valve will get clogged. In this case, a hand-operated auger may be necessary. Be ready to close the valve quickly once the clog is cleared.

## 15. Propane Gas System

Propane gas is used to operate the range, oven, furnace, water heater, and the refrigerator (when 120-Volt AC power is unavailable). The gas is stored in portable DOT cylinders.

In its natural state, propane is colorless and odorless. An odorant is added to the gas at the refinery to give it a very distinct odor – similar to onions or garlic. You may smell this odor occasionally, especially after filling the tank. The filling process requires venting a small amount of gas, and sometimes high outdoor temperatures can cause expansion of the gas in the cylinder, and venting of the excess pressure through the safety valve. Another reason, and probably the most common, is that the odorant tends to settle near the bottom of the cylinder and as the cylinder get closer to empty, the concentrated odorant becomes more obvious. Any time you smell gas, you should investigate the cause. It is possible that you may not be sensitive to the odorant used, and therefore would not notice the smell of gas. That is why it is very important that you pay attention to the propane leak detector installed in your trailer. If the leak detector sounds, or if you smell gas:

1. Extinguish any open flames, pilot lights, and all smoking materials.
2. Do not touch electrical switches.
3. Shut off the gas supply at the cylinder valves.
4. Open doors and other ventilation openings.
5. Evacuate the trailer of all occupants.
6. Have the gas system checked and the leak source corrected before using the system again.

Read all appliance literature, including the information on the propane cylinders and regulator, provided in the Owner's Information Package. Follow any instructions provided in the appliance manuals.



*If a leak is detected, do not continue to use the propane system until the leak is repaired. Failure to comply could result in explosion resulting in death or serious injury.*



*Follow the instructions and warnings noted in the appliance and equipment owner's manuals as well as the ones listed here.*

### Propane Safety Precautions

Propane is highly flammable and is potentially explosive if not handled properly. It is not poisonous, but can cause drowsiness and may result in suffocation. If you maintain the system properly, you can expect nearly trouble-free operation. Always observe the following when handling and using propane:

- Do not obstruct access to the cylinders. Access to the cylinders is critical in an emergency.
- Inspect the entire propane system for leaks or damaged parts before each trip and before filling the cylinders.
- Never check for leaks with an open flame. Use an approved leak detection solution or a non-ammuniated, non-chlorinated soap solution only. If the leak cannot be located, take the trailer to a propane service facility.
- Do not attempt to fill the propane cylinders yourself. Filling should be done only by qualified personnel using the required special tools and fittings.
- When filling the propane cylinders, use extreme caution and make sure others do also. Keep any flame, spark or anything that might produce a spark at least 25 feet from the filling operation. **DO NOT SMOKE.**
- Observe the warning label located near the propane cylinders. The label reads "DO NOT FILL CONTAINER(S) TO MORE THAN 80 PERCENT OF CAPACITY."
- Alterations, even as simple as mounting a plaque, can cause an unseen propane, water or electrical line to be damaged. Any nailing, screwing, drilling, or similar operation on or in the trailer could be hazardous. Always be careful when drilling holes or fastening objects to the trailer.
- Turn off the main propane valve, pilot lights, appliances, and their ignitors when filling the propane cylinders and/or tow vehicle fuel tank.
- Burning propane consumes oxygen in your trailer. Keep your trailer properly ventilated at all times, especially when the oven or stove is in use.
- Do not place or store propane tanks or cylinders, gasoline or other flammable liquids inside the trailer (Standard models only. Carrying these items in cargo hauler models is permitted.)

- Do not use any other propane container other than the ones furnished with your trailer without being sure that all connecting components are compatible, and that it meets all applicable regulations and codes.
- Do not use cooking appliances for comfort heating.
- Before opening the main propane valve, be sure that all inside valves and burners are closed. Make sure all appliances, plumbing and outside vents are open and free from obstructions such as ice and snow. Make sure the breather vent on the propane regulator is clean and clear of obstructions.
- Make sure the regulator vent is facing downward.
- Portable fuel-burning equipment, including wood and charcoal grills and stoves, should not be used inside the trailer. The use of this equipment inside the trailer may cause fires or asphyxiation.
- Do not use a wrench or pliers to close the main shut-off valve. This valve is designed to be closed leak tight by hand. If a tool is required to stop a leak, the valve probably needs repair or replacement.
- If you do not have the special tools and training necessary, do not attempt to repair or modify propane system components.
- Annual maintenance on the propane system, appliances, and equipment should be done only by an authorized dealer or repair facility.
- Insects can build nests in the burners of the various appliances and equipment. The burners and orifices for the propane gas appliances and equipment should be cleaned out by an authorized dealer or repair facility whenever necessary, but no less frequently than each year.
- Always think safety.

 **CAUTION**

*The supply cylinder is not completely empty until the red indicator is fully visible in the indicator window. There will still be pressure in the empty cylinder.*

 **WARNING**

*With a cylinder removed, the hose from the regulator must be capped. Gas will escape to the atmosphere through the open connection if pressure in the supply cylinder drops to*

*5 psig (red indicator flag visible). If the changeover lever is turned to the disconnected side gas will escape.*

### **Propane System Components**

The propane system consists of the propane cylinders with overfill protection devices (OPD), the automatic change over regulator, hoses, associated pipe and tubing, and propane gas detector. All components meet UL or CSA requirements. The system has been tested and approved for use in your trailer, and has been performance tested at both the factory and the dealership. You should check the system for leaks periodically. Twice a year, or after a long storage period, the system should be checked by a qualified propane service facility. Check hoses for signs of deterioration every time you have the propane cylinders filled or serviced. Be sure any replacements meet original performance specifications. See the “Care and Maintenance” chapter for details on leak testing and system service. A gas leak detector is installed in your trailer that will detect the presence of propane and sound an alarm. A description of this device is in the “Safety First” chapter, and detailed operating instructions are included in your Owner’s Information Packet.

The regulator reduces the pressure of the gas from the cylinders to a safe, even level for use by the appliances. The regulator is adjusted for the proper pressure and is rechecked by your dealer. Do not adjust the regulator. If necessary, have the regulator checked and adjusted by an authorized propane service facility.

The automatic changeover feature allows an uninterrupted flow of gas to the system as long as both cylinders’ main valves are open. The arrow on the changeover lever points to the supply cylinder. When the supply cylinder becomes empty, the control will automatically begin to draw gas from the reserve cylinder. An indicator on the changeover will show red. By turning the arrow on the changeover lever to the reserve cylinder, the red indicator will disappear as long as there is gas in the reserve cylinder.

### **Propane Gas Lines**

The primary manifold is a black pipe located beneath the unit. Copper tubing, with flare fittings, are used as secondary lines running to the gas appliances. If repairs are needed to these lines or any component of the propane system, DO NOT ATTEMPT to repair yourself and follow the steps listed at the beginning of

this section that explain what to do if your leak detector sounds or if you smell gas.

Although your propane gas system was thoroughly inspected for leaks before delivery the propane gas system should be inspected and checked for leaks by a RV dealer at least once a year or any time the system is opened.

### **! WARNING**

*The propane piping system is designed for use with propane only. Do not connect natural gas to this system.*

### Propane Gas Leak Detector



Please refer to the manufacturer instructions supplied with the unit for care and operation of the propane gas leak detector. It is a safety device that is permanently mounted near the floor and is powered by 12V (the RV battery and/or converter). The detector is operational only as long as 12V power is available. If the power is disconnected, the monitor will not operate.

Should a propane leak occur, the detector will sound an alarm and continue until the gas has dissipated or until a mute button is pressed. The mute button will only stop the alarm from sounding for 60 seconds and alarm will reoccur if gas is still present. The alarm may sound at times when no propane is present when household products are in use such as aerosol hair spray, cleaners, adhesives, alcohol etc. Be sure to air out the trailer thoroughly after delivery and when using these products.

The propane gas leak detector has a self check circuit which runs at all times while receiving 12 Volt power. In the event that the circuitry fails, a failure alarm will sound and the operating indicator will cease to light.

### **! WARNING**

*Propane gas may be present in other areas before it can reach the detector's location. The detector only indicates*

*the presence of propane gas at the sensor. Never check for leaks with an open flame. Use only a mild soap and water solution. Do not use products that contain ammonia or chlorine.*

### **! WARNING**

*Propane 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.*

### Filling the Propane Tanks

Your trailer is equipped with two propane cylinders. When one cylinder becomes empty, you can switch over to the other without interrupting the gas flow. This makes it convenient when you are located at a location that may be a long way from a gas supplier.

Dutchmen propane systems are equipped with a Type I cylinder connector. This connector makes them as easy to connect and disconnect as a garden hose.

The Type I connection system uses the excess flow pigtail hose, distinguished by the large green nylon swivel nut. The green swivel nut attaches to the outside of the cylinder valve with right hand threads. Tighten the swivel nut by hand. DO NOT use tools.



The safety features of this system prevent gas from flowing unless the connection is tight and will limit excessive gas flow. In cases of extreme heat, 240° to 300°F, at the connection, the connection to the cylinder will be shut down.

The empty cylinder can be removed without disturbing the gas flow to the system.



1. Before removing an empty cylinder for refilling, close the main valve on the empty cylinder – hand tighten only. Rotate the changeover lever on the regulator so that it points to the full cylinder.



2. Loosen the hand nut attaching the flexible hose to the cylinder.

3. Loosen the wing nut holding the retaining bracket for each cylinder or release the hold-down strap. Remove the empty cylinder. Install the plastic plug in the cylinder port.
4. Have the empty cylinder filled at a safe distance from the trailer. All DOT propane cylinders have overfill protection devices (OPD) which will prevent overfilling.
5. Place the refilled cylinder back on the trailer. Secure the cylinder with the retaining strap or bracket and wing nut.

**! WARNING**

*The propane gas system in your trailer is designed for propane gas only. Do not connect natural gas to this system. This could result in a fire or an explosion.*

**! WARNING**

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

**NOTICE**

*Open the tank main valve slowly. Opening the tank main valve quickly can be hard on the regulator diaphragm and result in leaks.*

6. Remove the plastic plug and connect the flexible hose to the cylinder. Tighten the hand nut securely but not over-tight.
7. Slowly open the main valve on the cylinder. Do not “snap” open the valve. The sudden pressure surge can damage the regulator diaphragm components. Test the connection for leaks with propane leak detector solution or a soapy solution that does not contain ammonia or chlorine.
8. Double check the hold-down bracket or security strap to make sure the tanks are firmly secure.

Take empty propane cylinders to a propane gas supplier or service station which sells propane. Do not attempt to fill the cylinders yourself. The cylinders can legally be filled to 80% of each cylinder’s total capacity. Filling a cylinder to 80% allows for 20% vapor and expansion

space. A built-in safety feature indicates when the cylinder has been filled to the 80% level. Overfilling propane cylinders can result in uncontrolled gas flow which can cause fire or explosion. A properly filled cylinder will contain 80% of its volume as liquid propane.

A simple way to determine the level of liquid in a propane cylinder is to slowly pour a pot of hot water down the side of the cylinder, warming a path from top to bottom. Wait 10 seconds. Now run your hand down the path warmed by the water until you feel a cold line – this indicates the liquid level. Be sure to wipe the cylinder dry to prevent rust spots.

If the cylinder is to be put in storage for a length of time or is empty, close the main valve on the cylinder and install the plug in the cylinder port. This will minimize entry of moisture in the regulator or cylinder. Moisture can cause freezing damage in the regulator.

### **Using Propane in Low Temperatures**

If you expect to use the system in cold temperatures, be sure to use a gas mixture that will not freeze up. Your local propane gas service facility can advise you on the best mixture of gas for your anticipated traveling needs. As long as the system components are kept above the vapor point of the gas, the system will function in low temperatures. Different gas blends are available, and you should contact your gas supplier for information on blends appropriate for your needs and the areas where you will be traveling.

Propane systems can freeze up during extremely cold weather. Although properly blended gas does not freeze, moisture or water vapor in the system or absorbed by the gas can freeze and partially or totally block the flow of gas. You can help prevent propane system freeze up:

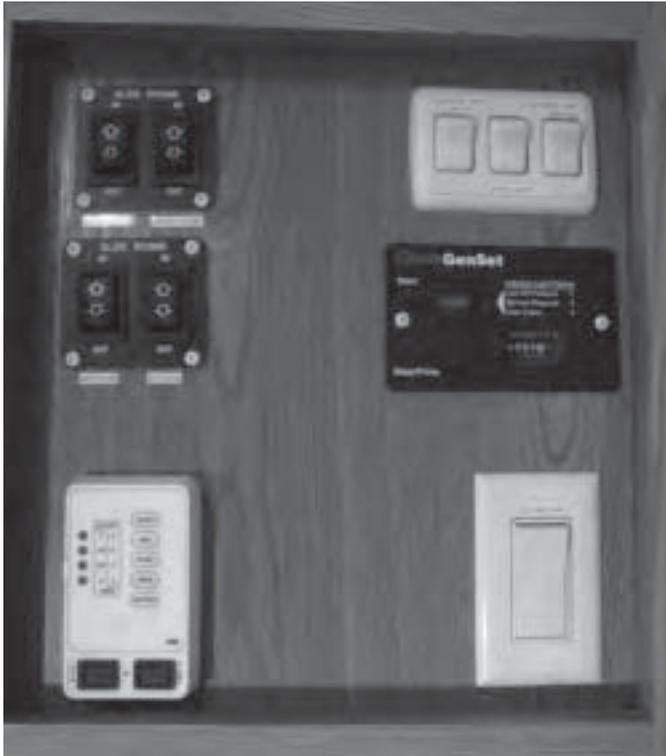
1. If you are unsure whether a cylinder is completely moisture-free, have your propane supplier inject a special, approved antifreeze or deicer into the cylinder.
2. Use the proper blend of gas for your traveling area. With the proper blend, freeze up is unlikely. If you do experience freeze up, have your propane service facility service the cylinders and regulator as required. NEVER TRY TO RESTORE GAS FLOW WITH ANY OPEN FLAME DEVICE.

## 16. Interior & Furnishings

### **! CAUTION**

*Some wood products such as OSB (oriented-strand board), hardwood plywood, or paneling used in your trailer may have been made with urea-formaldehyde and will release small quantities of formaldehyde. Formaldehyde can be irritating to the eyes and upper respiratory system of especially susceptible persons such as those with allergies or respiratory ailments. Proper ventilation will reduce indoor formaldehyde levels. If symptoms develop, consult a physician. Ventilation is important for making the interior of your trailer comfortable and is a part of good maintenance. Please read the section about ventilation in Chapter 4 of this Owner's Guide.*

#### **Interior Control Panel**



Many of the control, warning and indicator devices have been centralized in a panel similar to the one shown above. Specific components and layout depends on the model of your trailer and equipment installed. Details of each of the components are discussed in other chapters of this guide.

#### **Cabinets and Drawers**



The drawers run in metal guides. To remove a drawer, pull it out until it stops. On each side of the drawer is a latching mechanism. Press the latch while pulling the drawer out slightly to clear the latch tab (ball bearing drawer guides only). Pull the drawer out and lift slightly to clear the guide wheels.

To re-install the drawer, lift it slightly while sliding the guide wheels into the track. The latch mechanism will reset automatically.

#### **Interior Storage**

Interior storage areas may be found in a number of places in your trailer – overhead compartments, wall closets, under the dinette, sofa, under the bed and in lavy/galley cabinets.



Some interior storage areas may be equipped with 12-volt lights. Be sure these lights are OFF when you close the door or your battery could be rapidly discharged if you are not connected to shore power.

## **! WARNING**

*Do not store or stack storage items too close to lights. Allow at least 12 inches of clear space around all light in storage compartments. Lights left on for extended periods of time can generate intensive heat, causing damage to the light and personal items stored too close to the lens and potentially result in a fire.*

Be sure to close cabinet and closet doors and drawers before towing the trailer. Catches and detents will keep the doors and drawers closed under most travel conditions, but may not hold on very rough roads.

### **Travel Locks**

Sliding doors in the trailer may be equipped with travel locks to keep them from being damaged or causing damage during travel. Make sure all sliding and folding doors are locked and secure during travel.

### **Folding Doors/Dividers**

The divider doors allow you to separate areas of the interior. When the dividers are open during travel, be sure to attach the hold back to keep the door from sliding back and forth.

## **! CAUTION**

*Some lighting fixtures may use halogen or other high energy lamps. Both the lamp(s) and fixture(s) may get very hot when they are on. Do not touch these lighting fixtures when they are on. Always allow them to cool before attempting to change the lamp or clean the fixture.*

### **Interior Lighting**

Both decorative and utility lighting fixtures may be installed in your trailer. Controls may be either on the fixture itself or on a wall switch. Always replace bulbs with the same type and wattage as originally installed or as indicated on the fixture.

### **Dinette Conversion**



To convert the dinette into a bed:

1. Extend the slide-out (if equipped) as necessary.
2. Remove and set aside seat and back cushions.
3. Pull table top up and off the support posts. NOTE: The support posts may come out of the floor sockets with the table top. Use caution as they may fall out of the table top sockets when lifted.
4. Remove the support posts and put them aside.
5. Lay the table top down on the seat frame supports, flat side up. Be sure the table top is squarely supported on the seat frame supports.
6. Arrange the seat and back cushions on the table top for the desired sleeping surface.
7. Reverse procedure to restore dinette.

### **Sofa Conversion (Hide-A-Bed)**



To convert the sofa/lounge into a bed:

1. Extend slide-out (if equipped) if necessary.
2. Remove and set aside bottom cushions.

3. Grasp and pull center handle to open bed.
4. Unfold leg/frame to the floor, pull center handle to unfold bed.
5. Reverse to restore sofa.

**! CAUTION**

*Pinch Hazards. Keep hands, fingers, feet, and toes away from the sofalbed/lounge frame pivot points when converting to beds or sofas.*

**! CAUTION**

*Do not allow anyone to ride on the power bunks while raising, lowering or adjusting the bunks.*

**Sofa Conversion (Magic Air Sofa)**



1. Extend slide-out (if equipped) if necessary.
2. Remove and set aside bottom cushions.
3. Inflate the Magic Air Bed.
4. Reverse to restore sofa.

**Side Sleeper/Lounge Conversion**



To convert the side sleeper into a bed:

1. Remove and set aside table top and support posts.
2. Pull back cushion forward and over with a rolling motion.
3. Extend and lock bed frame legs into position. Be sure the spring-loaded balls snap into place.
4. Roll back cushion over so legs sit on floor.
5. Reverse procedure to restore lounge.

**Elevated beds**



**! CAUTION**

- *Maximum load capacity labels are located at each bunk position.*
- *Failure to comply with the load capacity could cause bed failure which may result in injury.*
- *Elevated beds may present a fall hazard which may result in injury. Please consult the Owner's Manual*

*for more information regarding elevated beds and the use of bed rails.*

Various Dutchmen RV products are equipped with standard built-in elevated beds or bed loft areas. These beds can be 4 feet or higher above the floor level and are often enclosed on one, two, or three sides and sometimes even partially on a fourth side. Because there are so many potential users and different types of elevated bed designs, elevated beds are not equipped with bed rails.

### Tips for Safe Usage:

Please use sound judgment when allowing children to sleep in any style of elevated bed. Generally, it is not suitable for children under the age of 6 to sleep in an elevated bed or bed loft area.

Discuss proper usage of any elevated bed/electric bed lift system with your children and make sure they are supervised if playing in the bedroom/sleeping area of the trailer with elevated beds.

Please do not allow horseplay on or under the elevated beds and no items such as hooks, belts, jump ropes, or towels should hang from any part of the elevated bed.

Place a night light in the bedroom/sleeping area so users can see at night when getting in and out of the beds.

No more than one person should be in an elevated bed at once and make sure you follow the weight restrictions posted on the bed.

When preparing the trailer for travel, be sure to remove and stow the bunk ladder (if equipped) to prevent it from moving inside the trailer, possibly causing damage to the interior. Use caution when positioning the ladder. Do not use the ladder for any other purpose.

Position the bunk ladder so that the bottom of the ladder is about 1/4 of its length from the bunk. Keep the ladder dry and free of oil, grease, paint or other slipping hazards.

Keep the area around the top and bottom of the ladder clear of obstacles.

Do not tie sections of ladders together to form a longer ladder.

Do not use the bunk ladder for any other purpose.

### Electric Bed Lift Systems



#### **CAUTION**

- 600 lbs. Maximum load capacity.
- Failure to comply with the load capacity could cause bed failure which may result in injury.
- Bed(s) must be stowed in the up position during travel.
- Elevated beds may present a fall hazard which may result in injury. Please consult the Components' Owner's Manual for more information regarding elevated beds and the use of bed rails.

*Do not allow children to operate the rear cargo area electric bed lift systems in Ramp Trailers. The lowering and raising of the electric beds should be only conducted by an adult. No person should be on the electric beds when being lowered or raised.*

#### **WARNING**

*Do not operate the bed lift with people or objects on bed(s). Serious injury may result.*

Many of the Sport Utility Trailers/Ramp Trailers come equipped with rear cargo area electric bed lift systems. (See the label in the Ramp Trailer for proper operation of the rear cargo area electric bed lift systems). The bottom beds in some floor plans also can be converted to dual sofas. Again, like the standard built-in elevated beds, because of the design and the various uses, the rear electric beds are not equipped with a bed rail system.

#### **CAUTION**

*Make sure area for bed lift is free of obstacles above and below.*

 **CAUTION**

*Do not use the power bunks to store or lift any items including ATVs.*

**Use of Bed Rails**

We feel that you, as the customer, are best equipped to determine if a bed rail system is necessary or best for you based on your intended uses, the actual users of the elevated beds, and the comfort level of the users.

For those customers who would prefer using an elevated bed with a bed rail, there are numerous bed rail styles, sizes, heights, and designs available, even in the style of bumpers, which can be purchased at various retail locations and/or on the internet.

When installing a bed rail please make sure that you follow the manufacturer's installation instructions carefully and that you take in to account the size and height of the mattress (either originally installed by Dutchmen or later replaced by you) so that the rails are the appropriate height above the top of the mattress. This is important because residential mattresses differ in size from the RV mattresses originally installed. Please also make sure that the bed rail you select allows for adequate room to get in and out of the elevated bed after installation, especially in the event of an emergency.

**Overhead Vents**

Overhead vents are located in the galley and bath areas for fresh air circulation and for exhausting heat, smoke, odors and water vapor from cooking, bathing, etc.

Turn the crank in the center of the vent to open or close. Some vents may also have a 12-volt electric fan and switch.

Be sure to close the overhead vents before traveling. Wind and low overhead clearances could damage the vent(s). Close the vent lid completely while going down the road or in windy conditions. It could ratchet open and be damaged.

Use soapy water to clean the vent covers. Vacuum the screens. Lubricate the mechanism once a year with light, water resistant grease.

**Miniblinds and Window Shades**

 **WARNING**

*Small children can strangle in the loop of pull cords, chain and bead cords, and cords that run through window coverings. They can also wrap cords around their necks. To avoid strangulation and entanglement, keep cords out of the reach of young children. Also:*

- 1. Install safety devices that remove the cord loop or reduce access to cords, and*
- 2. Move cribs and furniture away from window covering cords.*

## 17. Equipment & Appliances

### Appliance Operating Guides

Operating guides and manuals for the appliances and components installed in your trailer are in your Owner's Packet. These manuals outline operating and maintenance details. Most difficulties with the use of appliances, entertainment systems, and other components are related to a lack of understanding with the operation of the system. Take time to read the operating manuals and guides for each component.

### Refrigerator

The refrigerator operates on either propane or 120-Volt AC electric power. If both power sources are available, 120-Volt AC operation will be selected unless the controls are set to GAS. The ice maker (if equipped) will operate only if the refrigerator is operating on 120-Volt AC power. Refer to the refrigerator operating manual for details on operation and maintenance.

If your refrigerator is equipped with an ice maker, it must be drained and winterized if you plan to store or operate the trailer in freezing temperatures. See the Storage and Winterization chapter in this manual, or the refrigerator operating manual.

Most RV refrigerators use absorption of heat rather than a blower to cool the interior of the refrigerator. They will not keep the interior cool if you open and close the door more than necessary, and particularly if you leave the door open for a minute or more. Once the interior cold dissipates, it can take an hour or more to restore the cold temperatures inside. During defrost cycles, the interior may rise to 50 degrees or more for a period of several hours. If you open the door during this period it will take much longer to restore the interior cold temperature. Your refrigerator will keep things colder when it is full as the cold products inside help with cooling. Pre-cooling refrigerated items will help reduce the time it takes to get everything in the refrigerator cold.

### NOTICE

*Some appliances are installed with compartment space built around them to allow for proper air flow. Do not restrict this air flow space by storing anything in the space. Please pay attention to the following notice installed in*

*certain appliance compartments/air spaces: DO NOT USE THIS SPACE FOR STORAGE OF ANY KIND.*

### DANGER

*Do not store or use gasoline, other combustible materials or liquids, or any other materials in this compartment or adjacent to the refrigerator.*

*If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or death.*

### Range and Oven

### WARNING

*Do not use this appliance unless privacy curtains (if equipped) are secured. Failure to comply could result in fire or serious injury.*

### WARNING

*Burning propane consumes oxygen in your trailer. Keep the trailer properly ventilated at all times, especially if the oven is in use. Failure to do so may result in excess levels of carbon monoxide to be present in the unit resulting in personal injury or death.*

### WARNING

*It is not safe to use cooking appliances for comfort heating. Failure to do so may result in excess levels of carbon monoxide to be present in the unit resulting in personal injury or death.*

The range and oven operate on propane. A detailed guide to operating the range and oven is in your Owner's Package. Make sure you review all the safety precautions and warnings in the Propane System chapter in this manual. When traveling, make sure the range and oven pilot are OFF. The range and oven require an adequate supply of fresh air for combustion. Make sure there is proper ventilation when using the cooking appliances.

Before operating the range or oven:

1. Secure all privacy curtains (if equipped)
2. Open the overhead vent or turn on the exhaust fan and,
3. Open a window.

A warning label is located in the cooking area to remind you to provide an adequate supply of fresh air

for combustion. Unlike homes, the amount of oxygen is limited due to the size of the trailer. Proper ventilation when using the cooking appliance(s) will reduce the danger of asphyxiation. It is especially important that cooking appliances not be used for comfort heating as the danger of asphyxiation is greater when the appliance is used for long periods of time.

### Furnace



The furnace is a propane gas appliance that requires twelve volt power to electronically light. New furnaces will sometimes emit smoke and an odor during the first five to ten minutes of initial use. This is generally caused by paint or other manufacturing coatings being burnt off the combustion chamber. Do not mistake this for a malfunctioning furnace. To help insure air quality during this process, open windows and roof vents. This will help disperse any odors. You may also turn on any exhaust fans the RV is equipped with to help with this process.



To ignite the furnace, first make sure the liquid propane fuel is on. (See the propane section for instructions). The furnace in your RV is much like your home heating system, just turn the thermostat to the furnace/heat position and select the temperature setting. You should hear the furnace fan start and then the ignition of the furnace. Once the temperature inside the RV has reached the desired setting the furnace will shut down. This sequence will repeat when the temperature drops below the desired setting.

### NOTICE

*When operating the furnace, make sure that the furnace exhaust is clear and free to exhaust without obstruction. Failure to do so could damage the furnace and cause damage to the RV.*

### ! WARNING

*All pilot lights, appliances and their igniters should be turned off before refueling of fuel tanks and or propane containers. Failure to comply could result in death or serious injury.*

### Air Conditioner(s) (If Equipped)

To operate a single air conditioner, the trailer can be connected to 30-amp shore power, or you can

operate the generator. To operate both air conditioners (if equipped), the trailer must either be connected to 50-amp shore power, or the generator must be operated if connected to 30-amp shore power. Neither air conditioner can be operated from an inverter (if equipped).

Please note that typical RV air conditioning systems will result in interior temperatures approximately 20 degrees cooler than the outside air temperature. They cannot maintain an interior temperature of 70 degrees with an outdoor temperature of 110 degrees. In extreme hot and humid weather conditions, you will not be able to cool the interior of the trailer beyond the capacity limits of the air conditioner(s). This does not indicate a defective air conditioner.

You can help keep interior temperatures down by parking – whenever possible – in the shade. Ceiling fans (if equipped) and other interior air circulating fans can also help keep indoor temperatures relatively comfortable. Closing windows and shades/blinds early in the day can also help keep indoor temperatures down.

#### **Washer / Dryer Prep (If Equipped)**

The washer/dryer prep includes the water lines and electrical outlet. As the RV Washer/Dryer combination can be purchased in either a vented or ventless version. The vent is not included. When choosing to use a vented model the following instructions must be adhered to:

1. A clothes dryer moisture-lint exhaust duct shall not be connected to any other duct, vent, or chimney.
2. The exhaust duct shall be of sufficient length so as not to terminate beneath the recreational vehicle.
3. Moisture-lint exhaust ducts shall not be connected with sheet metal screws or other fastening devices that extend into the interior of the duct.
4. Moisture-lint exhaust duct and termination fittings shall be installed in accordance with the appliance manufacturer's printed instructions.

#### **Water Heater**

The water heater operates on propane and 120-Volt AC. Before operating the water heater, make sure it is full of water. Observe all the following warnings and any additional warning in the manufacturer's instructions.

Before operating the water heater:

Do not try to light the burner by hand. The water heater does not have a pilot light. It is equipped with an ignition device which lights the burner automatically.

Before lighting, smell all around the appliance area for gas.

### **NOTICE**

*If the trailer is not to be used for some time or if it will be subjected to freezing temperatures without heat, drain the water heater as outlined in the CARE and MAINTENANCE chapter.*

If you do smell gas, take action as directed in the following WARNING.

### **! WARNING**

*If you smell gas, do not try to light any appliance. Do not touch any electrical switch or use any phone in your trailer. Call a qualified service technician immediately.*

*Do not store or use gasoline or other combustible materials or liquids near or adjacent to the water heater.*

*Make sure all ignition systems are OFF during any type of refueling.*

*If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or death.*

*Do not attempt to repair the automatic gas valve. No adjustments are necessary. Tampering with the gas valve could result in a fire or explosion.*

*Do not use this appliance if any part has been under water. Call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.*

#### **Propane Operation**

1. Be sure the water heater is full. Open a hot water faucet and check that water flows.
2. Press the switch ON. If the burner does not light, the system will automatically attempt two more tries for ignition before lockout. During ignition, the indicator light will illuminate. If the light does not go off, the ignition system is in lockout.
3. To turn the water heater off, press the water heater switch to OFF.

If the burner will not come on, check the following items before calling a service technician:

- Propane supply is empty or not turned on

- Fuse blown
- See Troubleshooting chart in water heater operating manual.

### Pressure/Temperature Relief Valve

Occasionally this valve may “weep”. This is not a defect. The water heater tank is designed internally with an air gap at the top to reduce the weeping. The normal expansion of water while it is being heated may, over a period of time, absorb the air and cause weeping. To reduce the weeping:

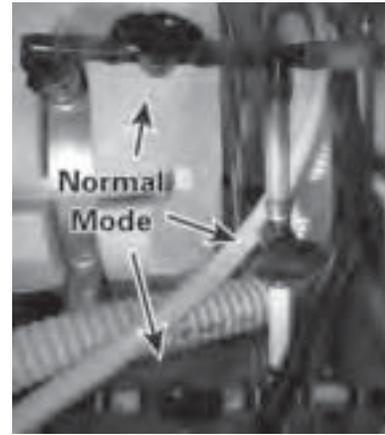
1. Turn off the water heater and let it cool.
2. Turn off water pump or city water connection.
3. Open a hot water faucet.
4. Pull out on the handle of the relief valve and allow water to flow from the valve until it stops.
5. Release the handle on the valve. It should snap closed.
6. Close the faucet and turn on water supply. As the tank fills, the air pocket will be restored.



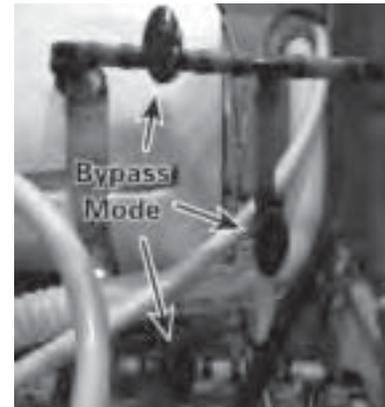
### Water Heater Bypass System

The bypass valve allows the water heater tank to be bypassed when winterizing the fresh water system. Bypassing the water heater will save several gallons of antifreeze solution.

The bypass valve is located on the back of the water heater or in the cold water line near the water heater. You may have to look in a cabinet or behind a panel to see the back of the water heater. Just look on the outside of the trailer, locate the water heater and find the corresponding location inside.



For normal water heater operation, be sure the bypass valve handle is set as shown above. To bypass the water heater for winterization, turn the valve handle one-quarter turn clockwise as shown below. The valve is a quarter-turn valve, and only has two positions – open and closed.



If the bypass valve is set to the bypass position, the water heater will not fill with water. If you don't get hot water after a reasonable time, check this valve and be sure it is set to the normal position.

See the Care and Maintenance chapter for more details on fresh water system care and maintenance.

## 18. Slide-Outs

The slide-outs are designed to provide additional living space during stationary camping.

Before operating the slide-out, level and stabilize the trailer. If the trailer is not level, the slideout room and/or the mechanism may be damaged. Stabilizer jacks help keep the trailer square so the slideout extends/retracts and seals correctly. Be sure stabilizer jacks are placed on a solid ground surface. Piers or supports are not necessary under the slide-out when extended.

The slide-out system will make creaking or squeaking noises during operation. These noises are normal especially during the break-in period while the components are seating properly. This will decrease after a few extend/retract cycles. Note that there will always be some noticeable noises when operating the slide-out.

When the slide-out is extended, it is outside the trailer. Rain, snow, ice, blowing dirt and dust, and other debris may cling to the outside surfaces of the slide-out and mechanism. When the slide-out is retracted, whatever is on the outside will be brought inside the trailer. Before retracting the slideout, check the outside surfaces. Wipe them dry or clean as much as possible. If the slide-out is extended for a long period, be sure to check for insect nests, etc. before retracting. Check for standing water on the slide-out topper awning (if equipped). And remember that the slide-out seals are not designed to remove all the water or debris that may accumulate on the outside surfaces. You must wipe it off before retracting the slide-out.

### **WARNING**

*Stand clear of the room's interior path and verify that there are no exterior obstructions before extending or retracting the slide-out. Failure to do so could result in serious injury or death.*

### **WARNING**

*There are hard, sharp metal edges in the slide-out mechanism. Do not allow children to play under the slide-out(s) when extended. Failure to do so could result in serious injury or death.*

### **WARNING**

*The slideout room and mechanism are a potential crush hazard. Disconnect the batteries to disable power to the*

*slideout(s) before working on or under the slide-out(s). Failure to do so could result in serious injury or death.*

### **WARNING**

*Keep people, pets and objects away from the slide-out room and mechanism during operation. The mechanism assembly may pinch or catch loose clothing causing personal injury.*

### **NOTICE**

*Do not move the trailer with the slide-out extended. Damage can occur to the slideout or the trailer.*

### **Slide-Out Operation (Electric Drive Gear)**

#### *Electric Operation*

1. Level and stabilize the trailer.
2. Be sure the batteries are fully charged or the trailer is connected to shore power. Turn off all unnecessary lights to maximize available power.
3. Close all cabinet doors and drawers.
4. Before extending, be sure the area outside the trailer is free of obstacles – trees, boulders, fences, etc.
5. When extending or retracting, be sure the interior is clear of people, pets, furniture, clothing, etc. Move any furniture or other items which may be in the path of the slide-out unit. If the outside of the slideout is wet, wipe it dry before retracting.
6. Press and hold the slide-out room switch to either IN or OUT until the slideout is completely extended or retracted. The slide-out(s) must be completely extended or retracted for seals to be effective.

### **NOTE**

*If you hold the switch past when the room is fully extended or retracted, the motor will automatically stop.*

### **Hydraulic Slide Out Operation**

### **WARNING**

*Be sure to keep hands and other body parts clear of fluid leaks. Fluid leaks in the Lippert Hydraulic System may be under pressure and can cause serious skin penetrating injuries.*

Please read and study the operating manual before you operate the system. The Lippert Electronic Leveling and Slide-out System is an electric/hydraulic system.

A 12V DC electric motor drives a hydraulic pump that moves fluid through a system of hoses, fittings and slide rams to open and close the slide-out rooms. The Lippert Electronic Slide-out System is totally integrated into the chassis of the coach at the manufacturer.

### Quick Set Wireless Remote Control (If Equipped)

The wireless remote control system operates the slide rooms, power awnings, power stabilizer jacks and or landing gear, and the front patio light. Please refer to the separate component manual for operating instructions.

### Slide Room Manual Operation

There are six types of slide rooms currently used in Dutchmen recreational vehicles; electric cable, "Happi-Jac", hydraulic, electric gear drive, bed slide and the new Schwintec multiple motor technology. The following will assist you if you ever need to manually retract the room.

#### Electric Cable



Cable drive units are generally used on smaller light weight RV's. These systems use an electric motor to drive a cable/pulley system to extend and retract the room. The motor is activated by a switch generally located at the entry door of the unit and/or at the kitchen area. Although the system is very dependable it can be manually retracted. In order to do this it will be necessary to remove the interior cover panel above the slide room to access the motor and cable system; once accessed, directions for retracting the room are placed on the wall. The cable used to manually operate the room is located in the owner's packet. The cable will require an electric drill to spin the cable attachment.

### "Happi-Jac" Electric Gear Drive



The Happi-Jac electric above floor slide system can be extended or retracted manually using a  $\frac{3}{4}$ " socket and ratchet tool. To retract the room, remove the access panel generally located below the sofa or dinette seat. Place the socket on the shaft connected to the motor and gear mechanism and turn clockwise to extend the room or counter clockwise to retract it. Once the room is retracted it is advisable to secure the room in with travel locks.

## Hydraulic



This system uses a hydraulic cylinder and a pump to push the slide room in and out. The system is activated by using a remote control device. As with the other slide mechanisms, it is possible to retract the room manually by installing an electric and/or battery driver into the socket on the pump and manually driving the pump. The pump will be driven clockwise for extend and counter clockwise for retraction.

Located close to the pump assembly will be a bank of control valves (pictured below).



Each valve affects a different slide room (or landing gears). Closing any of these valves prevents fluid from circulating through that circuit, preventing extension or retraction. This is a great feature if you only want to extend/retract select rooms (i.e. extend one side and not the other). In addition, manual retraction (if necessary) will be quicker when retracting one room at a time (moving less fluid). Turning the valve clockwise closes the circuit; counter-clockwise opens the circuit for operation.

## Electric Gear Drive



This system utilizes a motor to drive a gear mounted to the bottom of the slide mechanism. There are two types of gears used depending on the depth of the room and the required travel - worm gear and sprocket style. Both of these gear mechanisms can be accessed from either under the RV or through a hole in the skirting directly opposite the room on the other side of the trailer. The motor is not generally accessible without removal of the under carriage or access panel but can be driven without accessing the motor. The crank

used to manually drive or rotate the gear assembly is supplied with the RV.

### Bed Slide



Bed slide can be retracted manually the same as the electric gear drive. The main difference between the systems is the access point for the motor. To access the motor it is necessary to lift the bed top. Take care when lifting to insure the bed stays up without additional support. The motor is mounted just under the aluminum support beams in the center of the bed. To manually retract, use a ratchet, extension and  $\frac{3}{4}$ " socket. Place on the hex head just outside the gear box. Turn clockwise to extend the room and counter clockwise to retract.

### Lippert Schwintec Slide System



This system utilizes four electric motors and gear systems. The system is operated by an electronic control unit. There is one for each slide room. This control can be tested using the error code or troubleshooting information located on the control itself. There is also a web site that will assist with helping you retract the room

if the system should fail. The web site is <http://www.youtube.com/watch?v=ymt1Uesf0Pc&feature=related>.

### **CAUTION**

*Do not manually retract/ extend the slide-out room or mechanism unless the battery is disconnected - cables removed or main disconnect switch is OFF.*

### **NOTICE**

*Slide-out setup and adjustment are routine owner maintenance items and are not covered under the warranty. If the slide-out system needs adjustment or re-leveling, your dealer or service center will charge you to perform these services. Regular maintenance and replacement of seals as soon as required will extend the life and usefulness of the slide-out system. If deteriorated seals are used past their useful life, rain, snow and ice can penetrate inside the trailer walls and/or roof and cause extensive damage that can be very expensive to repair. These repairs are not covered under the warranty.*

*Closely inspect the slide-out seals at least twice a year, before winter and again in the spring. Over time, the seals will stiffen, become brittle and crack. The time it takes for this to happen will vary depending on weather conditions and exposure to the sun. Seals that are protected from sunlight and hidden from view will last longer than the outer perimeter seals, but will still need replacing. If you see any evidence of water or wind leakage, have the slide-out seals checked. Replacement of these seals should be done by your dealer or authorized RV service center. It may be necessary to partially disassemble the slide-out and your dealer or service center has the special tools and experience to do this work correctly.*

### **NOTICE**

*Do not store the trailer with the slide-out(s) extended. Damage can occur to the slide-out or the trailer. Level your travel trailer when you put it in storage.*

## 19. Hybrid Tent Campers

Expandable end tent campers (or hybrid campers) offer great flexibility, light weight and easy towing. Proper care and use of the expandable end vinyl and canvas is critical to years of trouble free service. Be sure to keep the material surface clean and free of debris. Always make sure the material is dry when storing. When you break camp in wet weather, be sure to open your camper when you get home to dry the tent material thoroughly before long term storage.

When closing bunk end doors, make sure the tent material folds in properly and there are no “pinch points” which may damage the material. Occasionally check the bunk door seals to assure a tight seal when the doors are closed and latched. A simple “paper pull” test at the top center of the door will confirm a tight seal and no potential for leaks. With the door closed and latched with a piece of paper closed in at the top center, the paper should not easily pull out. A gentle “tug” without the paper moving will confirm a tight seal.

### Seasoning

Proper inspection and pre-soaking of hybrid travel trailer tent ends is essential and critical to assuring there will be no water leaks. All tent ends must be pre-conditioned prior to use to assure that they will not leak. The following procedure must be followed:

1. Set up the tent ends completely.
2. Spray wash the tent ends with a hose until soaking wet. **DO NOT USE A PRESSURE WASHER.**
3. Allow the tent ends to dry completely.
4. Repeat this process two (2) more times.

The above procedure allows the threads to swell up, dry and hold their expansion permanently, sealing off the needle holes. Properly completed, there should be no leaks from any of these seams.

Earlier tent models incorporated tie backs at the bottom of the window openings for the window cover. Dutchmen eliminated this feature due to the fact that the tie backs can wick water into the bunk area and leave small puddles under the mattress. Treating the tie backs with a waterproofing product can help eliminate this concern.

### Condensation

Condensation may collect in the form of water droplets on the inside surfaces of the tent canvas. This is particularly true as the evenings get cooler and the heater is used in the trailer. Improving air circulation by opening a window, operating a fan, or a dehumidifier will help to improve this condition.

### Setting Up

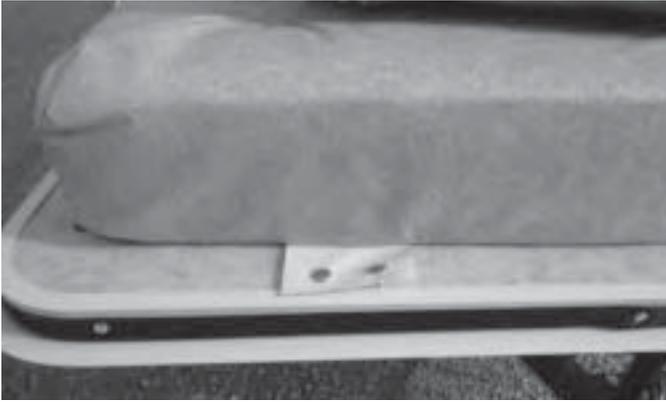
To set up the RV's tent ends:



- Release the locking mechanism on the fold down bunk door. Take special care when lowering the door to help ensure the tent folds out smoothly and does not catch on the cables.



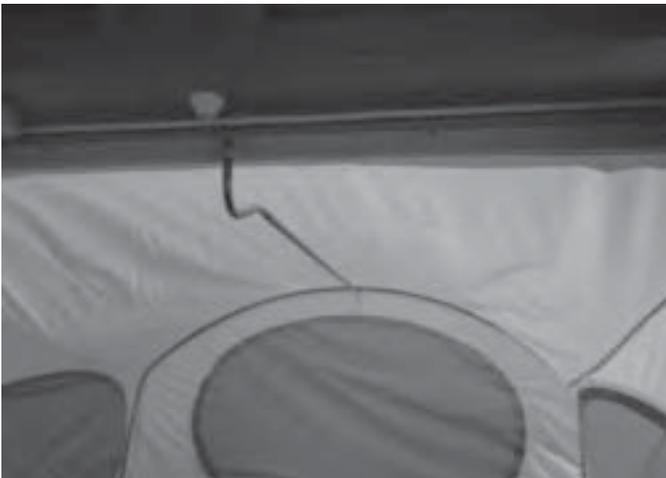
- Pull the tent over the edge of the bunk door and align the Velcro attachments on the door and tent so they hold their position. The sides must be attached first leaving the front to fold over at the corners and close the corner gaps.



- From the inside remove the mattress from its storage position. There are four snaps in the front corners that will need to be released to remove. This will make inserting the bow properly much easier.



- Place the plastic snap end or the straight end of the shepherds hook over the center of the bow and snap into position. Be careful to insure the shepherds hook is centered.



- Once the shepherds hook is attached; push the bow out to the end of the tent and snap the curved end of the shepherds hook into the front of the sidewall attachment receptacle.



- You may now place the mattress on the bed platform and adjust the Velcro attachment points where necessary to eliminate low spots or sagging of the fabric.

For tear down, simply reverse the above process.

#### **Tent Maintenance & Warranty**

- Keep the tent surface clean and free of debris.
- Always store dry.
- Avoid using “seam sealers” or wax materials. These may affect your warranty coverage.

Refer to your owner’s information provided with your camper for extended warranty coverage provisions regarding the tent material.

## 20. Toy Haulers – Sport Utility Recreational Vehicles

This chapter deals with trailers equipped with cargo loading ramps and fuel transfer systems. These recreational vehicles are sometimes referred to as “ramp trailers” or “toy haulers”. These trailers combine RV living quarters with a large cargo area and special consideration must be given to the topics in this chapter.

### Ramp Trailer Weight Distribution

All loaded trailers must remain within GVWR and GAWR limits. However, proper load distribution is of particular importance for ramp trailers. These trailers are designed to carry a variety of vehicles and cargo in the cargo storage area. These cargo items are typically heavy and consideration must be given to how they are loaded. Because most storage areas are at the rear of the vehicle the biggest concern is maintaining the correct hitch or pin weight percentage. Vehicles loaded incorrectly can have too little weight resting on the hitch or pin and can become unstable when towing. **Therefore, a hitch weight percentage of 10 – 15% for travel trailers and 20 – 25% for fifth wheels must be maintained.** For example, if the loaded vehicle weighs 8,000 pounds, the hitch weight for a travel trailer should be between 800 – 1,200 pounds (10 – 15% of the 8,000 pound total). For a fifth wheel this same 8,000 pound vehicle should have a pin weight of 1,600 – 2,000 pounds (20 – 25%). By maintaining the correct hitch percentage and staying within the limits of the GVWR and GAWR you can help insure a safe towing experience with your trailer.

### **WARNING**

*Locate and secure cargo and vehicles to maintain safe weight distribution in the cargo area and throughout the trailer. Improper weight distribution or overloading could lead to loss of vehicle control during travel resulting in serious injury or death. Follow all guidelines contained in this manual for loading and weighing procedures. Maintain the loaded hitch weight within the percent levels stated above. Where applicable, a hitch with built in sway control is recommended. Do not exceed the GVWR (gross vehicle weight rating) or the GAWR (gross axle weight rating) of either the tow trailer or tow vehicle.*

### Cargo Placement

Load vehicles and heavy cargo items in the cargo area as far forward as possible. Big, heavy items should be loaded where they can be securely tied down. Start with top heavy items if you have them. That’s usually a good place to start because you must have plenty of room available to properly tie them down. Tying them straight down is not secure enough. They need to be tied off at several angles or they could fall over in an abrupt change in speed or direction. You need room to accomplish this. Small items can be used to fill they spaces around them later.

Once you have the heavy items located, check the hitch weight. If the hitch weight is significantly more or less than the guidelines in section “Ramp Trailer Weight Distribution”, make the changes necessary to get close. Then the smaller items can be placed to bring the hitch weight into the recommended range. They should be located so that they will not move during travel. Placing them next to items that have already been tied down helps, but your main concern should be to not lose the balance of the trailer. Don’t forget you can also get one side of a trailer heavier than the other without a little planning. This can cause tire failures from overloading an individual tire or tires. This can also cause a very serious problem when cornering, even causing the trailer to turn over in a sudden turn.

Top heavy loads can cause problems not only in cornering but also in hard braking. They have a tendency to make the trailer “dive” in hard braking conditions. This suddenly increases tongue weight and can decrease tow vehicle front axle loading just when you need steering and brakes the most. Arrange the remainder of the load to act as a counter weight to minimize this effect. Never place heavy objects where they will dramatically affect handling in corners or bumps. Heavy weights placed well behind the axle can also reduce stability. A bicycle may be fine to hang out in back, but not a motorcycle. Use good common sense and always allow plenty of margin for safety.

## Ramp Trailer Loading Safety



The cargo door/loading ramp gives you complete access to the trailer cargo area. When lowered, the loading ramp allows you to easily load rolling cargo, bicycles, small motorcycles and ATV's, and small vehicles. This section outlines the safety precautions you should take when loading and unloading cargo and vehicles, as well as loading/unloading procedures, techniques and tips.

Use caution when using the loading ramp/door area of your trailer. This area has many uses and some things to be aware of are:

- Ramps and inclines
- Dissimilar surfaces that may be wet and slippery
- Awkward, heavy or unbalanced loads

Continuous attention to safety measures will help prevent accidents and possibly serious injuries and property damage. You can help minimize these risks, avoid hazards, and enjoy your recreational activities safely by using an effective decision-making strategy as follows:

- **Identify hazards** or specific problems in your path. Equipment, materials, debris, other vehicles, children, pets, or any number of other things may be in your way when you load or unload cargo or vehicles.

- **Predict what may happen** and think of consequences of your actions. Be sure you are physically capable of handling the load safely and keeping it under control.
- **Decide what to do** based on your capabilities and the capabilities of your equipment.
- **Be sure** your cargo does not exceed the capacity of your loading ramp and the trailer.

### Loading Equipment

The loading equipment furnished with your trailer is the ramp door and the tie down attachment points in the cargo area floor. The rated capacity of the ramp door is 3,000 pounds. Each tie down D-ring attachment is rated at 1,500 pounds. Typically no tie down straps, cables, hooks, chains, wheel chocks, blocks, etc. are supplied with your trailer.

### Chocks and Blocks

Wheel chocks are wedge-shaped blocks placed in front of and behind the rear tires of a trailer to prevent the trailer from moving while it is being loaded. Always hitch the trailer to the tow vehicle, and use wheel chocks or other vehicle-restraining devices when loading and unloading the trailer. When chocking, use wheel chocks of the appropriate size and material to securely hold the vehicle. Don't use lumber, cinder blocks, rocks, or other make-shift items to chock.

### Tie Downs

Use tie downs rated for the weight of the object to be secured. Be sure to attach and secure each tie down so that it cannot come loose, unfastened, opened or released while the trailer is in motion. Also, use edge protection whenever a tie down could be damaged or cut at the point where it touches an article of cargo.

**Note: Do not over tighten tie downs as this will cause damage to the attachment hardware, floor structure and cargo.**

The working load limit of a tie down, associated connector, or attachment mechanism is the lowest working load limit of any of its components (including any tensioner device), or the working load limit of the anchor points to which it is attached, whichever is less. When you choose tie down hardware, choose items that are strong enough to hold the load you are securing. The load limit of each tie down used should be at least one-half the working load limit of each tie down that goes

from an anchor point on the trailer to an attachment point on an article of cargo. Check the tie down manufacturer's specifications to determine working load limits. **Note: Tie down hardware is typically not supplied with your trailer.**

When an article of cargo is not blocked or positioned to prevent movement in the forward direction, the number of tie downs needed depends on the length and weight of the articles. In all cases, use enough tie downs to secure the cargo from moving in any direction. Heavy tool chests or cabinets may require tie downs around bottom, middle and top to secure them. Be sure to lock or secure drawers in these chests or cabinets so they can't open while traveling. Keep handle bars, mirrors, etc. away from the trailer interior walls. The walls can be damaged by contact with hard, sharp objects.

### Loading Ramp Operation

1. Hitch the trailer to a tow vehicle before loading and unloading the rear cargo area. Select a parking site where the edge of the rear door/loading ramp will rest entirely on a flat, level surface and the corners of the door will be supported. Avoid soft sand or mud surfaces. When the trailer is loaded, the added cargo weight may cause the trailer and/or tow vehicle to become stuck.



*Always hook the trailer to the tow vehicle before moving cargo or using the loading ramp. Failure to do so could cause the trailer to tip back as the load is shifted to the rear of the cargo area causing property damage, personal injury, and/or death.*

2. Set the parking brake on the tow vehicle and install wheel chocks in front and behind the tires on one axle on each side of the trailer. DO NOT use the emergency brake away switch on the trailer.
3. Lower the front and rear jacks on the trailer to stabilize it.
4. Unlock the rear door loading ramp and carefully lower it to the ground. If equipped, extend the ramp extension and install the supporting hardware.
5. If equipped, with a power bunk, raise both bunks fully.
6. Move things out of the way of your cargo, whether you are loading, or unloading. Have an idea where

your cargo will be positioned after your load/unload activities.

7. Use caution and proper lifting techniques when loading and unloading items from the cargo area.
8. Use extreme caution when loading/unloading ATVs, motorcycles, or other vehicles ("motorized cargo" or "vehicle(s)"). These machines are generally heavy, and may be hot from operation and/or covered with dirt, oil, or other substances that may make them slippery. See the section "Loading and Unloading Motorized Cargo" for more details.
9. Make certain that the door seals and hinge area are free of any debris, such as sand or snow before closing the rear door loading ramp.
10. Inspect the hinges, assist springs, and latch mechanism before each trip for signs of wear or damage, and make any needed repairs for safe operation and towing.

### Loading and Unloading Motorized Cargo

Many recreation ATV or motorcycle accidents and injuries happen while loading and unloading. Steep inclines, unstable ramps, power and a short stopping area can make loading motorized cargo difficult. There is no absolute safe way to drive your motorized cargo into the trailer. Take the following steps to aid in reducing the risks associated with transporting, storing, or occupying the trailer with motorized equipment and vehicles.

- Wear personal protective equipment while loading vehicles to/from the trailer. This includes but is not limited to, an approved motor vehicle helmet, leather boots, appropriate gloves, and eye protection.
- Never stand in the path of equipment when loading/unloading with the ramp, and keep bystanders away from the ramps.
- Keep body parts completely clear of the ramp door hinge pinch area at all times.
- Check parking brakes on the vehicle(s) you are loading/unloading and on the tow vehicle.
- Inspect ramp and trailer floor/loading area for cracks, damage, oil or other debris that may cause slippage.
- Remove carpet from section where fueled vehicles or motorized equipment will be stored.

## **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 ride in the vehicle storage area while vehicles are present.
2. Do not sleep in the vehicle storage area while vehicles are present.
3. Close doors and windows in walls of separation (if installed) while any vehicle is present.
4. Run fuel out of the engines of stored vehicles shutting off fuel at the fuel tank.
5. Do not store, transport, or dispense fuel inside the vehicle.
6. Open the windows, openings, or air ventilation systems provided for venting the transportation area when vehicles are present.
7. Do not operate propane appliances, pilot lights, or electrical equipment when motorized vehicles are present.

*FAILURE TO COMPLY COULD RESULT IN AN INCREASED RISK OF FIRE, EXPLOSION, ASPHYXIATION, DEATH, OR SERIOUS INJURY.*

## **WARNING**

*CARBON MONOXIDE GAS CAN KILL YOU. Fuel burning devices such as ATVs or motorcycles that burn gasoline, diesel, or other fuels produce carbon monoxide when they are operating. Carbon monoxide gas is invisible, odorless, and colorless. Dangerous levels of carbon monoxide gas can accumulate in a trailer which cannot be detected by sight, smell, or taste. Even small quantities of carbon monoxide can cause carbon monoxide poisoning and suffocation, which will cause death, serious injury, or permanent disability. DO NOT start ATVs, motorcycles, or other fuel burning devices while they are located in your trailer.*

## **WARNING**

*There is a hazard of serious personal injury when using a loading ramp. If the motorized cargo loses traction and spins sideways, it may slip sideways off the ramp, tipping sideways, and possibly falling on the rider causing injury.*

*Always follow the ramp loading instructions in the owner's manual for the motorized cargo.*

### **Ramp Positioning**

The ramp angle from the trailer floor to the ground affects the risk when loading/unloading cargo. If the ramp angle is reduced, and all other conditions remain the same, risk is reduced. Always try to reduce the loading ramp angle; the shallower the ramp angle, the easier cargo loading will be. Position the trailer to take advantage of any terrain features that will help reduce the ramp angle. In all cases, be sure the ends of the ramp door can be fully supported. Always position the loading ramp so the ends in contact with the ground are level or at the same height. An uneven ramp may cause the cargo to tip over sideways during loading/unloading.

### **Loading Under Power**

Always follow the instructions in the owner's manual of motorized cargo. If not available, following are generalized suggestions for loading motorized cargo. **At no time should these instructions over-ride the instructions contained in the motorized cargo owner's manual.**

1. Shift into lowest gear before ascending ramps.
2. Align wheels with ramps both loading and unloading.
3. Approach straight on, not on an angle. If you are off to one side and the ground is uneven where the ramp touches the ground, an unbalanced situation can occur.
4. The operator should apply throttle smoothly and climb up the ramp at low speed. Too much or sudden increases in throttle will cause the vehicle to be harder to control and may cause the vehicle to impact the front of the trailer cargo area or over-turn.
5. Stop when fully in the trailer. Keep handle bars, mirrors, etc. away from the trailer interior walls. The walls can be damaged by contact with hard, sharp objects.
6. After loading, close the fuel valve and run the engine until it stops (motorcycles and ATVs). Turn the ignition key off and remove it. Set the parking brake. For manual clutch machines, leave the machine in gear.

7. Secure the vehicle with tie downs. The attachment points you select on the equipment must be strong enough to support the weight of the equipment. Usually attachment points that are low and centered on the equipment frame will be good. An attachment to a decorative piece of chrome or plastic will usually not be a good tie-down point. Consider and leverage action that may occur. An attachment point past the center of the equipment could cause the equipment to either swing around or flip over, causing damage to the equipment, or personal injury. If you have any doubt about the attachment point you have selected, stop and find a better attachment point.

### Secure the Load

Install blocking devices in the front, back, and on both sides of the wheels to keep it from rolling. This block is strictly an additional safety precaution and does not reduce the need for strapping the vehicle in securely.

Use a minimum of three tie downs to secure the vehicle to the trailer. Use one tie down to secure the front of the vehicle to the trailer. Use two tie downs to secure the rear of the vehicle to the trailer, four tie downs (one at each corner) are preferred.

Attach tie down hooks to the vehicle's frame, not to an accessory such as a mirror, handle bar, pedal, etc. Hooks on the other end must be attached to vehicle cargo anchors installed in the trailer.

For transport, motorized cargo with manual transmissions should be left in first gear. Vehicles with automatic transmissions should be in the Park position. The vehicle's ignition key should be turned off and removed, the parking brake set, the run/stop switch in the stop (or off) position and the fuel lever turned to the off position.

### **WARNING**

*Failure to properly secure cargo could cause property damage, injury and/or death.*

### Unloading Motorized Cargo

The safest method of unloading is to push the vehicle down the ramp, carefully braking to ensure control of the vehicle. If you loaded your vehicle forward (front in) that means you will unload it in reverse. Driving a motorized vehicle in reverse down the ramp is not recommended. A slight turn of the handle or slip of the

wheel can cause your vehicle to fall, tip or roll sideways. If you are on or in the vehicle you can be injured or killed. Unload the vehicle safely as follows:

1. Be sure the back tires of the vehicle are aligned with the ramp, and there are no people, pets or obstructions in the unloading area at the end of the ramp. Assure that the ground surface will support the vehicle, and that the vehicle cannot roll away uncontrolled.
2. Stand at the front of the vehicle.
3. Push the vehicle backward in line with the ramp.
4. As the rear tires start down the ramp let it roll slowly backwards braking enough to control the speed but not so much as to skid and lose control.

### Fuel Transfer System



A fuel transfer system allows you to store gasoline for use in motorcycles, snowmobiles, ATVs, or other vehicles and equipment while at a campsite. This system consists of a fuel tank, fuel tank filler, fuel gauge, fuel transfer pump, fuel transfer valve and hose with fuel nozzle. Some vehicles will be equipped with a switch at the battery and a switch at the pump. Other vehicles will be equipped with a timer switch allowing the pump to run for five minute intervals. A bonding jumper wire reduces the possibility of static electricity discharge between the fuel station and the equipment being fueled. To fill the tank, remove the fuel filler cap and fill the tank with the grade of gasoline required by your equipment. When replacing the fuel fill cap, be sure it seats squarely and turn it firmly to lock it on the fill pipe neck.

### **WARNING**

*NO SMOKING. Before dispensing of fuel, turn off all engines, fuel burning appliances, and their igniters (see*

*operating instructions). Connect the bonding jumper wire to the vehicle receiving fuel. Ground the RV. Do not dispense fuel within 20 feet of an ignition source or within 10 feet of another recreational vehicle or structure. Failure to comply could result in fire, death or serious injury.*

### **Fuel Transfer System Safety**

Static electricity-related incidents when refueling are extremely unusual. They appear to happen most often during cool or cold and dry climate conditions. In rare circumstances, these static related incidents have resulted in a brief flash fire occurring at the fill point. You can minimize these and other potential fueling hazards by following safe refueling procedures.

A build-up of static electricity can be caused by reentering a vehicle during fueling, particularly in cool or cold and dry weather. If you return to the fuel fill pipe during refueling, the static may discharge at the fill point, causing a flash fire or small sustained fire with gasoline refueling vapors.

Here are some additional refueling safety guidelines when refueling your vehicle or filling up gasoline storage containers:

- Turn off the vehicle engines. Disable or turn off any auxiliary sources of ignition: the trailer furnace, water heater, cooking unit, and any pilot lights. Turn off the main propane valve.
- Do not smoke, light matches or lighters while operating the refueling system, or when using gasoline.
- Use only the refueling latch provided on the gasoline dispenser nozzle.
- Never jam or otherwise try to lock the refueling latch on the nozzle open.
- Do not re-enter your vehicle during refueling. If you cannot avoid reentering your vehicle, discharge any static build-up BEFORE reaching for the nozzle by touching something metal with a bare hand, such as the vehicle body or frame, away from the nozzle.
- In the unlikely event a static-caused fire occurs when refueling, leave the nozzle in the fill pipe and back away from the vehicle. Turn off the fuel pump master switch immediately.
- Do not over-fill or top-off your vehicle tank, which can cause gasoline spillage.

- Never allow children under licensed driving age to operate the pump.
- Avoid prolonged breathing of gasoline vapors. Use gasoline only in open areas that get plenty of fresh air. Keep your face away from the nozzle or container opening.
- Never siphon gasoline by mouth. Never put gasoline in your mouth for any reason; gasoline can be harmful or fatal if swallowed. If someone swallows gasoline, do not induce vomiting; contact an emergency medical service provider immediately.
- Keep gasoline away from your eyes and skin; it may cause irritation. Remove gasoline-soaked clothing immediately.
- Use gasoline as a motor fuel only. Never use gasoline to wash your hands or as a cleaning solvent.

### **Fuel Transfer System Operation**

To operate the fuel transfer system (also see the “Fuel Pump Owner’s Manual” in your owner’s information package):

1. Lower the tongue jack or fifth-wheel jacks to the ground. This will electrostatically ground the trailer to reduce the possibility of static discharge while refueling.
2. Set the master disconnect switch to ON. This will either be located at the battery or at the fuel pump area.
3. Close the vents in the side of the trailer to prevent fuel pump vapor from entering the trailer.
4. Attach the ground clip securely to a bare metal part of the equipment to be fueled (frame, handle bar, axle bolt, etc.)
5. Turn the fuel transfer pump switch to ON. For vehicles equipped with a timer, turn the timer to on and this will allow the pump to run 5 minutes. When the pump stops, turn on again if necessary for another 5 minute run.
6. Remove the fuel hose and nozzle from its compartment. An automatic bypass valve prevents pressure buildup when the pump is on with the nozzle closed.
7. Place the nozzle into the equipment fuel filler and squeeze the handle to allow fuel to flow. Be careful

not to overfill the equipment fuel tank. Wipe up any spilled fuel.

8. When finished, release the nozzle handle and return the nozzle to its compartment and shut off the pump switch.
9. When you are finished with all fueling, turn off the pump master switch either at the pump or at the battery if equipped.
10. Lock the fuel transfer nozzle compartment to prevent unauthorized use. The nozzle compartment must be locked at all times when not dispensing fuel.

 **WARNING**

*If a fuel spill occurs in the storage area of the trailer, open the window and sidewall vents, and wipe up the fuel with cloth or paper towels. Dispose of the towels in a suitable hazardous waste container. Do not hose out the trailer with water. Clean the fuel spill areas with a grease/oil dissolving cleaner such as 409®. Thoroughly dry the spill areas.*

 **WARNING**

*Fuel-soaked rags or other materials contain flammable and/or explosive fuel vapors and other hazardous substances. Clean up materials should be temporarily stored in a nonflammable, vapor-tight container until proper disposal facilities are available. Do not store flammable clean up rags or materials inside the trailer, inside any other vehicle or near any source of flame or ignition.*

 **WARNING**

*All parts of the fuel transfer system including but not limited to the hoses, pump, nozzle, fittings, and tank have been selected for their quality, safety, and intended application. Any alteration or replacement of any part by other than Dutchmen Original Equipment Manufacturing parts could jeopardize the integrity of the system and may result in serious injury or death.*

*If your fueling system is not working properly or you need additional information on the use of the system contact your authorized Dutchmen dealer immediately or call Dutchmen directly.*

## 21. Care & Maintenance

Your trailer will provide you with many years of enjoyable use if you follow a good plan of maintenance and care. Time spent taking care of your trailer will pay for itself in extended vehicle life and help protect your investment. You can do most of the maintenance items on your trailer if you are mechanically inclined. If you prefer, your dealer can coordinate or perform these services for you.



This section is intended to give you a general overview of the service and maintenance required for the trailer. Detailed service and maintenance information can be found in the owner's manuals for the various components installed in the trailer. These manuals are in your Owner's Package. There may be times when comprehensive and detailed diagnostic and repair procedures may be required. In those situations, you should contact your dealer or Dutchmen.

### Chassis

#### *Tires And Wheels*



The tire manufacturer's recommended inflation pressure is stamped on the sidewall of the tire. The maximum tire pressure is also listed on the trailer VIN label. Check the tires frequently to be sure they are properly inflated. Always check tire pressure when the tires are cold. Check that the air pressure is equal in all tires. When replacing tires, make sure the replacement tire is the same size and load capacity as the original. See the "Tires and Wheels" chapter for more information.

Direct sunlight and "smog" can be very damaging to your trailer tires. Periodically coat them with a tire preservative. Generally, good tire care requires only washing with water and a good quality car wash soap.

During periods of non-use or storage, make sure the tires are fully inflated to the maximum rated pressure. Keep the tires shaded from the sun to prevent weather cracking. A barrier such as a heavy garbage bag, a piece of carpet or a piece of plywood between the trailer tires and a concrete or asphalt surface it is parked on will help prevent possible tire damage from chemicals in the parking surface.

You may notice some tire sidewall discoloration, especially during warm weather. This discoloration is normal. It is the migration of the wax and anti-oxidant compounds that are part of the tire materials. The wax forms a protective coating on the tire to reduce damage from ozone and ultraviolet rays from the sun. Please note that this coating affects only the cosmetic look of the tire and does not affect the structure or strength of the tire.

## CAUTION

*The spare tire and wheel are heavy. Be careful when lowering the spare to the ground.*

### **Axles, Brakes and Suspension**

The axles are designed to last the life of your trailer with periodic service, lubrication of the wheel bearings and shackles, adjustment and inspection of shackles, shackle links and springs. Refer to the axle manufacturer's manual in your Owner's Package for detailed service and maintenance information.

### **Suspension Lubrication**

The suspension system has anti-friction bushings located in the spring eyes and equalizer. These parts do not require routine lubrication. They should be periodically inspected for signs of excessive wear, cracking or hole elongation. If excessive wear, cracking or hole elongation exists, all links and worn parts should be replaced immediately.

### **5th-Wheel Landing Gear**

1. Before each use, inspect the drop tube and inner ram tube. Replace if either are bent or damaged.
2. Lubricate the landing gear once each year.

Extend the landing gear legs as far as possible. Clean the drop tube and inner ram tube. Coat the exposed surface of the tubes with silicone spray lubricant. Oil the shaft bushings in the gearbox and leg gear heads with sae 30 oil. Lubricate the gears in the gearbox and landing leg gear heads with extreme pressure grease.

## CAUTION

*Always wear eye protection when examining the underside of the trailer. Road debris, dirt, oil, or other hazardous substances may be present and fall into your eyes.*

### **Frame**

The frame has been painted with an environmentally safe paint. This paint may wear off after a time. This is normal. You should inspect the frame for damage and paint wear. When necessary, have the frame touched up or repainted to prevent rust. The frame should be spray washed at least once a year and more often if traveling in dirty or dusty areas, and at the conclusion of any trips during winter months.

If the trailer is used in an area where salt is used on the roads or near the sea shore, rust proofing or undercoating the frame can help prevent rust and corrosion.

### **Exterior**

#### *Fiberglass Side Walls*

Fiberglass exterior wall surfaces will provide years of environmental protection. 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 or integrity. Weathering can take the form of chalking, fading and yellowing and are excluded from warranty coverage.

Wash the exterior with any mild, nonabrasive car or RV wash soap or detergent to remove oil, grease, dust, and dirt. Never use strong solvents or harsh abrasives. Do not dry wipe the surface. Always clean the exterior in the shade or on a cloudy day when the wall surfaces are cool. After washing, follow with a thorough clean water rinse. Dry with a chamois or soft cloth to reduce spots and streaks.

Apply a good, nonabrasive automotive wax to the fiberglass surfaces only after washing and drying. NOTE: Do not apply wax to the graphics. Do not use rubbing compound on the fiberglass finish.

#### *Fiberglass Front and Rear Caps (If Equipped)*

Depending on model, the front and rear caps of your trailer may be made of fiberglass with a gel coat surface. This gel coat surface contains the color material and is generally about 10 times thicker than paint. The gel coat is strong and robust, but can be damaged by sun exposure, road grime, dust, dirt, insects, saps and drippings from trees, and environmental air pollution. Routine maintenance will keep the gel coat looking like new.



Generally, you can use automotive wash and wax products to maintain the gel coat. NOTE: Do not apply wax to the graphics. Cleaning with a mild detergent or car wash solution will remove normal accumulations of soil. Avoid products advertised as “all-in-one” or liquid spray or rinse wash products that don’t require actual physical rubbing of the fiberglass surface. The rubbing or wiping of the surface with the wash product and wash mitt or cloth helps to remove any slight oxidation of the surface, and any grime or grit that may have become imbedded in the gel coat. It also provides a slight polishing effect. About every six months, you should follow a thorough washing with an application of a high quality automotive finish polish to the fiberglass surfaces only, and then a good coat of automotive wax. The wax helps seal the gel coat surface, and helps prevent grit, grime and air pollution particles from embedding in the gel coat. Never use caustic, high alkaline cleaners, or cleaners containing ammonia. These products can cause a chemical reaction that will cause staining or darkening of the color which will require the use of rubbing compound or 400-grit sandpaper to remove. This will shorten the life of the gel coat.

### **NOTE**

*Do not apply wax to the graphics.*

As the gel coat begins to lose its gloss from constant exposure to the natural environment and pollutants, it will require some special attention to restore the original gloss and color. After washing with a mild soap solution, waxing in the spring and fall with a self-cleaning automotive wax will restore most of the original gloss. If the gel coat surface has been allowed to weather badly, and washing and waxing do not restore the gloss, compounding will be necessary. After the stain,

scratches, or weathering has been removed, wax the surface to restore the gloss and seal out new soil accumulations. Consult with your dealer before attempting to restore badly weathered or stained gel coat surfaces.

### **NOTICE**

*Do not allow rubbing compound to get on the decals. Do not use wax with petroleum distillates on the decals. It will cause them to shrink and prematurely peel and fade.*

### **NOTICE**

*Do not use cleaners or conditioners containing petroleum solvents, harsh solvents, or citric based cleaners. You may cause irreparable damage to your vehicle.*

#### *Exterior Aluminum Walls (If Equipped)*

Wash with any mild, nonabrasive car or RV wash soap or detergent and water to remove oil, grease, dust, and dirt. Never use strong solvents or harsh abrasives. Do not “dry wipe” the surface. Always clean the exterior in the shade or on a cloudy day when the wall surfaces are cool. After washing, follow with a thorough clean water rinse. Dry with a chamois or soft cloth to reduce spots and streaks.

Apply a good, nonabrasive automotive wax to the metal surfaces only after washing and drying. NOTE: Do not apply wax to the graphics. This will help increase the life of the finish, especially in coastal areas or other areas where the finish is exposed to salt or industrial pollution. Do not use rubbing compound on the metal finish.

Important Note: You may notice waviness or slight distortion of the exterior metal surfaces, especially when the trailer has been sitting in the sun in hot weather. This is normal and does not indicate a defect in the sidewall(s). Thermal expansion and contraction of the metal causes this effect, and when the temperature returns to normal, the metal surfaces will return to their normal appearance. If you ever see this distortion of the metal surfaces, don’t try to fix it. Just leave it alone – nothing bad is happening.

#### *Decals/Exterior Graphics*

The decals are made of vinyl. They will fade from exposure to the sun. If you expect to park the trailer for an extended period outdoors, reposition it occasionally so the decals will fade equally. Clean the decals with soap and water. Never use strong solvents, rubbing

compound, petroleum distillates, citrus based soaps, etc. Do not apply wax to the graphics.

#### *EPDM (Ethylene Propylene Dieneterpolymer Membrane) Rubber Roof*

Proper care and maintenance is simple, easy, and requires no special materials. Inspect the roof every three months. Check the roof material for possible damage from trees or overhanging obstacles. Check the sealant used on the edge areas and around all accessories and components mounted on the roof as well as their mounting hardware and fasteners. If any defects, gaps or voids in the sealant are evident, reseal as soon as possible to prevent water leaks.

Use caution when placing objects on the roof, and use care when working on the top of your trailer. The roof membrane can be punctured, but is easily patched. The roof surface may be slippery when wet. Rinse the roof completely with clean water to remove loose dirt or debris.

Scrub the entire roof with a medium bristle brush, and a household cleaner such as Top Job®, Spic-N-Span®, or Ajax® cleanser mixed with water. Granulated cleaners do a better job on EPDM than liquid cleaners. Since the surface is not smooth like fiberglass, a medium bristle brush works better than a sponge. The rubber membrane requires scrubbing much like a white-wall tire. For tougher stains, like those from oak leaves or pine sap, use kitchen cleanser with bleach. Use extra care to control runoff onto the sidewalls when using products containing bleach. Rinse the roof and sidewalls thoroughly with clean water to remove all residue. Go inside the trailer and check for leaks.

**DO NOT USE ACETONE, ANY OIL BASED PRODUCTS OR PRODUCTS CONTAINING PETROLEUM DISTILLATES ON THE ROOF MEMBRANE.**

The roof membrane does not require periodic application of any product to protect it from UV rays or ozone. If desired, 303® Protectant for EPDM rubber roofs or other products compatible with EPDM roofing may be safely used. The membrane could be damaged by application of products not designed for use with EPDM.

### **CAUTION**

*The roof membrane may be very slippery when wet. Use caution when working on top of the trailer.*

### **NOTICE**

*Beware of areas where fruit or tree sap or harsh environmental fallout may stay on the roof for an extended period of time. These conditions may result in unremovable stains. If you are in these conditions, you may have to increase the frequency of your cleaning or premature deterioration may occur.*

#### *Exterior Doors*

All exterior doors should be closed and securely latched when traveling. Silicone spray lubricant can be used on hinges and latch mechanisms. Lubricate locks with dry graphite.

#### *Door Adjustments*

The cargo and compartment doors used in your trailer have no built-in adjustment feature. Over time, slight variations in installation and road dynamic conditions may cause the doors to settle slightly in the frame, causing the door to touch the frame before being completely closed. This very seldom reduces the actual performance of the door or lock.



A firm tug on the door at the opposite corner from any binding can almost always eliminate this problem. Another technique is to use a mallet and block of wood to remove any slight interference. During the course

of ownership, these doors might normally require this minor routine maintenance adjustment, and is not a warranty defect.

Use a wood block and mallet to tap the frame near the point of binding. Use light taps to adjust the frame and remove the interference. Taps in several locations near the interference may be required.

To align/adjust the screen door, pull up on the screen frame. Do it carefully so as to not bend the screen frame. You may have to repeat it a few times to get it just right. If you “overadjust”, just pull it back in the opposite direction, or pull down on the top corner of the frame.

The hinges are not designed to handle significant downward force as may happen over time when opening and closing the screen door. Pulling up on the corner of the frame will realign the hinge slightly to compensate for any settling. There is no adjustment available at the hinge.



Adjust the screen door latch by loosening the screws as shown. Move the latch plate for a good fit when the screen door is closed. Tighten screws after adjustment.



Normal operation and over the road dynamics will cause the screen door hinges to settle slightly, causing the screen frame to drag on the threshold.

#### **Exterior Attachments**

Covers on receptacles, vents, and other ABS plastic parts will fade or yellow over time. These items can be painted with Polar White enamel. Do not paint over labels.

#### **Sealants and Adhesives**

*YOUR TRAILER'S #1 ENEMY IS WATER. SEALANT INSPECTION AND MAINTENANCE OF THE SEALS ON YOUR TRAILER IS A CRUCIAL OWNER RESPONSIBILITY AND IS NOT COVERED BY THE WARRANTY.*



Close inspection and routine maintenance are crucial to the longevity of the trailer. Exposure to the elements and regional weather variations can accelerate sealant deterioration. Even the finest materials will eventually dry out and lose their effectiveness. Inspect the sealants around windows, doors, moldings and exterior components at least every three months. Also inspect around roof vents, other roof components, moldings around the front and rear caps, and perimeter moldings. A quick inspection prior to every trip will help reduce potential problems down the road.

When inspecting, check for cracks, voids, shrinkage, or any sign of deterioration. If any of these signs are noticed, have your dealer inspect and reseal if necessary. Cracked, void, deteriorated sealants in need of repair may allow water into the structure which can lead to very costly repairs.

If you ever notice interior leaks, contact your dealer or an authorized RV service center as soon as possible. Leak damage caused by failure to inspect and maintain the exterior sealants may affect your warranty coverage. Proper, complete and effective resealing usually requires

the removal and/or partial disassembly of some components on the trailer. These components may include:

- windows
- exterior compartment/luggage doors
- roof-mounted appliances and vents
- exterior appliance access doors
- exterior moldings/trim

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

Be aware that the removal of these components, and proper removal of old sealing materials, cleaning of surfaces and re-installation of components is time consuming and may require special tools. Your RV dealer or service center is best equipped to do a complete re-sealing of your trailer. Dutchmen recommends that you have this work done by a qualified RV dealer or service center.

### Rubber Seals

Rubber seals will deteriorate over time depending on the environment. This is normal and these parts may need replacing every two years. The seals on the entry door, exterior access, ramp door (if equipped), and compartment doors need to be checked for proper sealing from time to time. They can be cleaned with a mild detergent and coated with a protectant.

### Slide-Outs



*Do not work on the slideout room or mechanism unless the battery is disconnected, the cables are removed or main disconnect switch is OFF.*

Check the slide-out seals every three months. Clean the seals with a mild detergent and coat them with a protectant. Check the area behind the seals for debris. Pull out the edge of the seal and clean as necessary. When the slide-out is extended, visually inspect the inner slide rails. Check for excess buildup of dirt or other material. Clean off any debris that may have accumulated. Generally, lubrication is not required, but a dry lubricant such as graphite, silicone spray lubricant, or

a light lithium grease can be applied to the roller and bearing sleeve inner diameter. Remove any excess lubricant or grease so that dirt or debris do not build up. Do not lubricate the slide-out drive gears, gear racks, or roller outer diameter as this will attract dirt and debris.

### Windows And Screens

While washing the trailer, check for leaks around the windows. If a leak is detected inside the trailer, check for voids in the seal and the sealant at the top of the window. If necessary, have the sealant replaced.

The window frames contain drain slots at the bottom. These slots allow any water collected in the frame to drain. Make sure these drain slots are open.

### Awnings

#### *A&E Dometic Awning Care*

Awnings come with two types of fabric: acrylic, a cloth-type fabric, or vinyl. Acrylic awnings have the color woven right into the fabric. Acrylic also performs a little differently than vinyl in wet weather. It is water repellent, not waterproof. Because it's a woven cloth, it breathes. Air circulates through the fabric so dew and rain can dry quickly. However, you should avoid touching the underside of an acrylic awning when it is wet. This will break the surface tension and allow seepage through the fabric. If your awning gets rolled up while wet, unroll it as soon as the weather allows. It should be completely dry before rolling it up again to avoid mildew.

To keep your acrylic awning clean:

1. Simply hose it off occasionally and let it dry. Do not scrub your acrylic awning as this could remove its water retardant finish. If you need to remove a grease spot, use K2R Spot Remover®; this is different than how you would remove a similar spot from a vinyl awning.
2. While a vinyl awning is mildew resistant, mildew can still form on the dirt and dust that sticks to the awning. To avoid these problems you will need to keep your UV-protected vinyl awning clean. Use a mixture of 1/4-cup mild dish soap, 1/4-cup bleach and five gallons of fresh water. Soap the open awning with this mixture, then roll it up to soak for five minutes while you apply the mixture to the bottom of the awning. Next, open the awning and hose it off with fresh water top and bottom.

3. Repeat this process if necessary. After the awning is completely dry, roll it up. To remove a grease spot from a vinyl awning, use only soap and water.
4. Do not use household cleaners, mildew removers or hard bristle brushes!

### Carefree Awning Care

#### *Fabric Maintenance*

**DO NOT USE OIL BASED CLEANERS OR ANY CAUSTIC, GRANULATED, OR ABRASIVE TYPE CLEANERS ON YOUR CAREFREE AWNING PRODUCT.**

One of the best ways to keep the fabric looking good and to delay the need for deep or vigorous cleanings is to hose fabrics off on a monthly basis with clear water. This practice will help prevent dirt from becoming deeply imbedded in the fabric and eliminate the need for more frequent vigorous cleanings. In most environments, a thorough cleaning will be needed every two to three years.

When it's time for a thorough cleaning, the fabric can be cleaned while still on an awning frame.

Vinyl Fabric – Use a soft brush and warm water with soap.

Acrylic Fabric – Use a stiff brush and warm water with soap.

When cleaning the fabric:

- Always use a natural soap. Never detergent.
- Water should be cold to lukewarm. Never more than 100 degrees.
- Air-dry only. Never apply heat to the fabric.

#### *Mildew*

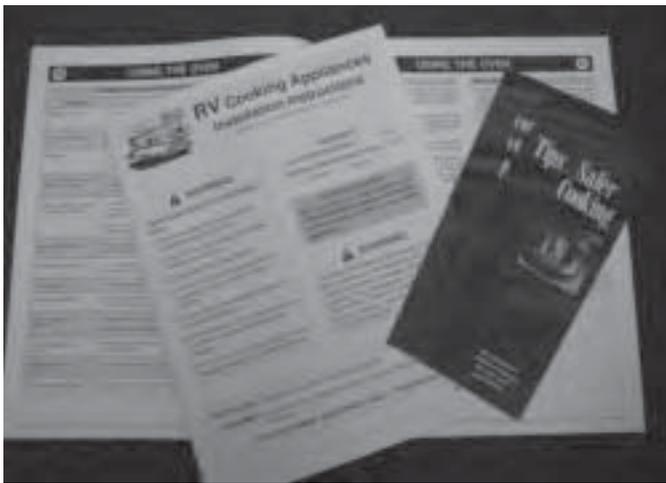
Mildew is a fungus growth that looks like dirt. Vinyl coated polyester fabrics are mildew resistant because of a chemical biocide in the vinyl coating. Under ordinary conditions, mildew will not appear. However, in areas where high temperature and humidity are common, mildew can be a problem and require the material to be washed more frequently. THOROUGHLY rinse the fabric with clean water and allow to air dry completely before rolling up the awning.

#### *Additional Tips for All Awnings:*

1. At the start of each camping season, make sure the top and bottom bracket screws are tight.

2. If the lift handle is hard to operate, spray it with silicone spray. You may have to repeat this process periodically. You may also need to spray the bottom bracket release tab and rafter and support arms.
3. One of the secrets to a long life for your awning is to keep it clean. Follow the instructions for your type of awning.
4. If you get water streaking or experience seeping behind your awning rail, inspect the rail for loose screws or peeled sealant.
5. To avoid water pooling, lower one end of the awning for proper water runoff.
6. For ease of hardware operation, rub candle wax on all sliding surfaces.
7. If you're expecting heavy or prolonged wind or rain or if you will be leaving the awning unattended, it's best to roll it up. Damage as a result of weather is not covered by warranty.
8. Finally, make sure the awning is extended high enough before opening the entry door.

#### *Appliances And Components*



Please refer to the individual appliance or component manual included in your Owner's Packet. If service is required for one of the appliances in your trailer, follow the instructions for service as outlined in the Owner's Manual for that appliance. Each appliance manufacturer has its own network of service outlets, and these centers are best qualified to service your appliances. If a problem persists, contact your selling dealer.

#### **Interior**

The interior of your trailer has been carefully crafted and decorated to accommodate your comfort and travel needs.

##### *Interior Cabinets and Walls*

The interior cabinets and wall panels are made of a paper or vinyl surface on luan or other substrate materials. They require little maintenance during the life of your trailer. Use a warm water and mild soap solution to clean them, and wipe them dry with a smooth, dry cloth. Do not use citrus based soaps, petroleum distillates or polish. These products will attack the vinyl or paper. Lightly wash with a soft cloth and quickly dry the finish.

##### *Floors*

**Carpets** - Vacuum carpet regularly. Clean with a good quality carpet cleaner.

**Vinyl floors** - Use a good quality cleaner.

**Squeaky floors** - Squeaky floors are usually caused by loose screws holding the walls or cabinets to the floor. Open the cabinet doors and remove the drawers to inspect screws and other fasteners holding them to the floor.

##### *Draperies and Cloth Upholstery*

The draperies and upholstery are of similar quality as found in your home. Treat them as you would any fine fabric. Some bedspreads and drapes require dry cleaning.

##### *Leather Furniture (If Equipped)*

Leather furniture should not be placed near a source of heat, or exposed to sunlight. Dust and wipe clean frequently to eliminate the clogging of pores. For spills and stains, blot with a clean, dry absorbent cloth or sponge. For matte finish leathers, if necessary, wipe with a clean cloth and damp lukewarm water. Do not dry wet areas with hair dryers, etc. For natural or non-protected leathers, blot liquid with a clean absorbent cloth. If a stain appears it will dissipate in time. Do not apply water to clean oil or grease spots. Do not use furniture polish, varnish, ammonia, saddle soaps, oils, abrasive cleaner soaps, etc.



*Do not use flammable or poisonous materials, such as polish remover, gasoline, naphtha, lacquer thinner, or carbon*

tetrachloride for any cleaning purpose. These items could cause damage to the materials and could cause injury or death.

#### *Day-Night Shades (If Equipped)*

Clean day-night shades with an automotive upholstery cleaner.

#### *Counters and Sinks*

Countertops and sinks are made of high pressure laminate materials, CORIAN, or Granite. These surfaces are stain resistant and require very little care. Clean and remove stains as follows:

Cleaning - For most dirt and stains, use soapy water or ammonia-based cleaner. For water marks, wipe with a damp cloth and towel dry. For difficult stains, use an abrasive cleaner and a green Scotch Brite® pad.

To disinfect, occasionally wipe the surface with a solution of 1 part household bleach and 1 part water.

#### *Tubs and Showers*

Tubs and showers are made of ABS plastic materials. Use a mild soap and water solution to clean the surface. DO NOT USE harsh chemicals, abrasives or abrasive cleansers, gasoline, chlorine, acetone, kersoene, Formula 409, or citrus-based cleaners. Citrus-based cleaners contain D-Limonene which attacks ABS plastic products. Check any cleaners for ABS plastic compatibility. Recommended cleaners:

- Ammonia diluted 1:3 with water
- Armoral Cleaner
- Armoral Protectant
- Fantastic Spray Cleaner (5% solution)
- Top Job Detergent (3%)
- Joy Liquid Detergent (5% solution)
- Mineral spirits
- Gel Gloss
- Crazy Clean All Purpose
- Murphy Household Oil Soap (diluted)
- Plexus Plastic Cleaner
- Windex Glass Cleaner
- ZEP 50, diluted 1:4 with water

#### *Cabinet Doors and Drawers*

Make sure the catches on all cabinets and doors are adjusted properly to prevent them from opening while traveling.

Adjusting the hinges, latches and catches is a routine maintenance task and is not covered under the warranty. You may have to make adjustments or tighten screws several times over the life of the trailer. Normal use and travel vibrations may cause minor flexing of the cabinets, drawers, and doors. Loosened screws or hardware is normal due to road vibrations.

### **Propane Appliances and Equipment**

#### *Maintenance*

Follow the instructions and warnings noted in the appliance and equipment owner's manual as well as the ones listed below:

- Annual maintenance should be conducted on the propane appliances and equipment by an authorized dealer or repair facility.
- Insects can build nests in the burners of the various appliances and equipment. The burner and burner orifice of the propane appliances and equipment should be cleaned out by an authorized dealer or repair facility anytime circumstances or conditions warrant, but no less frequently than on an annual basis.

#### *Propane Leak Testing*

Inspect all propane lines and fittings, including connections to appliances, frequently for possible damage and leaks. Brush or spray an approved gas leak detection solution or a non-chlorinated, non-ammoniated soap suds solution over all fittings and any areas showing apparent damage in the lines. The bubbles will grow in size to indicate a leak.



Always tighten flared fittings with two wrenches with opposing torque and do not over tighten. Using only one wrench or over tightening can cause leaks. Have someone stand by to close the main propane tank valve(s) while you are tightening fittings in case a leak occurs. After tightening, check again with the leak detection solution to be sure the leak is stopped. If bubbles still appear, your dealer or a gas service center may need to fix the problem.

The primary manifold is a black pipe located under the trailer. Copper tubing with flare fittings is used for secondary lines running to the gas appliances. NEVER attempt to splice ruptured lines. A new line should always be installed. Your dealer or authorized service center should perform any propane gas line service.

Although your propane system was thoroughly inspected for leaks before delivery, gas fittings can loosen from vibration during travel. Inspect the system at least once a year and have any problems corrected immediately.

### **WARNING**

*Do not use an open flame or any spark producing device to locate a leak. This could result in a fire or explosion resulting in personal injury or death.*

### **CAUTION**

*Do not use products containing ammonia or chlorine to check for leaks. Ammonia and chlorine can cause cracks to form on copper lines and brass fittings, causing a leak.*

## Plumbing System Maintenance

### *Fresh Water System*

#### *Draining The Fresh Water System*

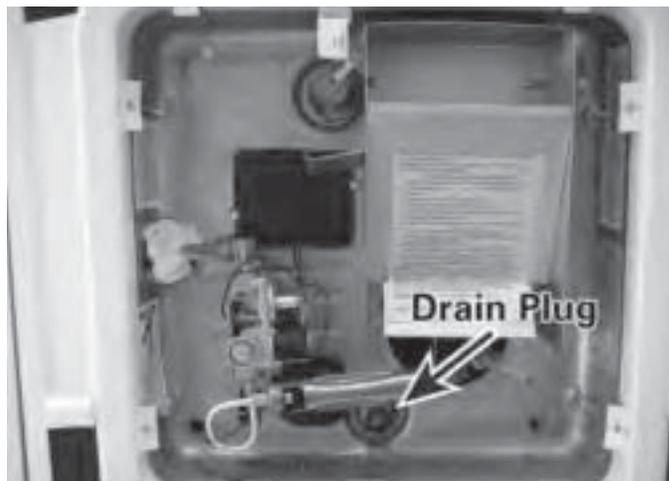
The fresh water system should be drained whenever the system becomes contaminated, prior to winter storage, and after long storage when the system was not drained prior to storage.

Drain the fresh water system as follows:

1. Open the fresh water tank drain valve (located directly under the fresh water tank, with line extending through the underbelly). Allow the tank to drain completely. If you are not draining the tank for storage, close the drain valve.

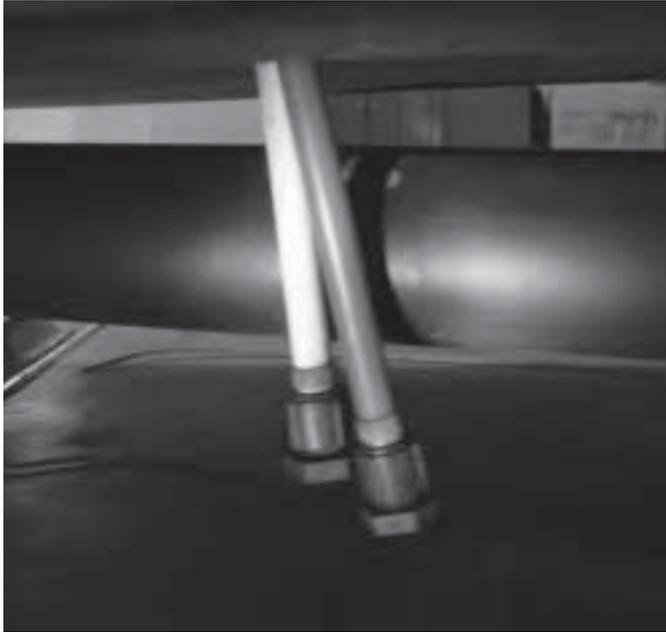


2. Turn the water heater OFF. Allow the heater to cool. Drain the water heater by removing the drain plug.



3. Disconnect the ice maker (if equipped) behind the refrigerator. Drain the ice maker as directed in the Storage and Winterization chapter.

4. Open all faucets, both hot and cold, in the galley, bathroom and shower. Open the shower head valve.
5. Open the system drain valves. These are the lowest points in the water system. Low point drains also protrude through the underbelly and are capped with threaded plastic plugs. Some applications use a plastic drain valve in place of the plugs. If you are not draining for storage, close the valve.



6. Completely drain the water from the toilet by depressing the foot pedals.
7. Remove the water filter cartridge (if equipped). If you are draining for storage, do not reinstall the filter cartridge. Store the cartridge in a safe place.
8. Disconnect the outside shower hose (if equipped) and drain the hose. Reconnect the hose.
9. Refer to the Storage and Winterization chapter.

### **Fresh Water System Sanitation ("Shock Treatment")**

The entire fresh water system should be sanitized before the first use, after a period of prolonged nonuse, or if the system becomes contaminated. To fully sanitize the system:

1. Open the water tank drain valve and completely drain the water tank. Close the valve after the tank is fully drained.
2. Add about 10 gallons of fresh water to the water tank.

3. Add 2/3-cup (six ounces) of liquid chlorine bleach for each 10 gallons of tank capacity (1/2-gallon bleach for 100 gallon tank).
4. Completely fill the water tank with fresh water.
5. Close the valve at the water purifier (if equipped) unless the water has been contaminated. If the water is contaminated, discard the filter cartridge and leave the valve open.
6. Close the ice maker valve and drain the ice maker (if equipped).
7. Turn the water pump ON and open all the sink, tub/shower drains and faucets to allow air to escape from the plumbing. After all air has escaped, and solution has flowed through the faucets, close the drains and faucets and turn the pump OFF. This fills the entire system with solution. When you can smell the chlorine from each faucet, that's enough.
8. Run the hot-water faucets until the old water has been purged from the hot-water tank, and it is now filled with the water/bleach solution from the water tank.
9. Allow the filled system to stand for several hours.
10. Open the tank drain valve, water heater drain valve and all faucets. Turn the water pump ON and flush the system until the water tank is empty. Turn the water pump OFF. Be careful to not overfill the waste tanks.
11. After draining the system, close the drain system.
12. To remove the bleach odor, mix ½ cup of baking soda with a gallon of water and pour into the fresh water tank.
13. Fill the tank completely and pump this solution through the water heater and the rest of the water lines. This solution can sit in the system for a few days.
14. To remove residual chlorine from the system, run fresh water through the system using the water pump with the faucets open.
15. Fill the water tank with fresh water for use.
16. Open the ice maker valve and water purifier valve (if equipped). Replace the filter cartridge if it had become contaminated.

### Water Pump Strainer Cleaning



Cleaning the fresh water pump inlet filters is a normal customer maintenance item. It is normal for debris to collect in this filter, especially during the first use of the plumbing system. It is performing its function by trapping any minor debris which might be present in the water. The water pump is typically mounted to the floor inside the unit inside the kitchen base. Removing drawers usually exposes the pump.

Cleaning this filter is not considered a warranty item. It is routine maintenance, and may be done many times over the life of the trailer depending on the purity of the water coming from the tank.

Check the water pump strainer at 90 days and at least once a year thereafter. Clean, if necessary, as follows:

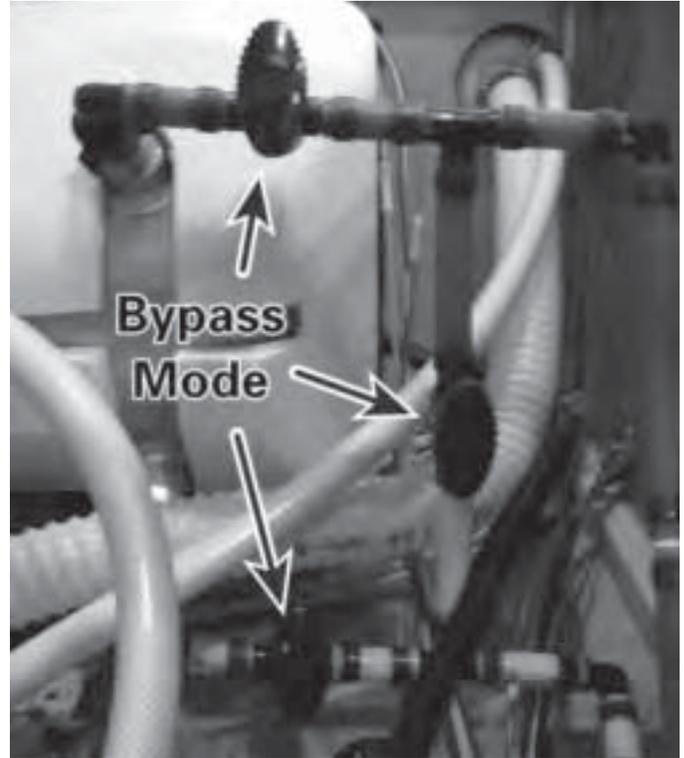
1. Turn water pump OFF.
2. Unscrew filter housing from water pump inlet fitting.
3. Lift out screen, clean it, insert it back into the housing and screw the housing back onto the water pump inlet fitting.
4. Operate the fresh water pump and check for leaks. Make sure the filter and housing are properly secured.

### Draining the Water Heater

If the trailer is to be stored during winter months in freezing temperatures, the water heater must be drained to prevent damage from freezing. See the "Storage and Winterization" chapter for more details on winterization.

1. Set water heater switches to OFF.

2. Set the heater bypass valve to BYPASS. Let water heater cool.



3. Remove drain plug from water heater tank, and depress the lever on the pressure/temperature relief valve to aid tank draining.
4. When water is drained, reinstall the drain plug. Replace the drain plug if it shows signs of deterioration.
5. Set the bypass valve to NORMAL unless you are winterizing with antifreeze. In that case, leave the valve in the BYPASS position.
6. Turn off the circuit breaker in the main panel that supplies power to the water heater element.

### Fresh Water Line Maintenance

The water lines need little, if any, maintenance. Plumbing system fittings can loosen over time due to vibration and flexing from road dynamics. This loosening can also occur during storage periods because of temperature changes. When the trailer is new, there may be a brief "break-in" period for plastic parts as the sealing surfaces seat and become permanently water tight. This is normal, and does not indicate a defect. Tightening these fittings is a routine maintenance item not covered under warranty.

Check the water line fittings where they attach to fixtures. Look for drips and other evidence of water. You can easily tighten the threaded fittings by hand or with

basic hand tools. Occasionally, simple Teflon tape can be used to assist this process. Exact installation details differ from those shown depending on model and placement of fixtures.

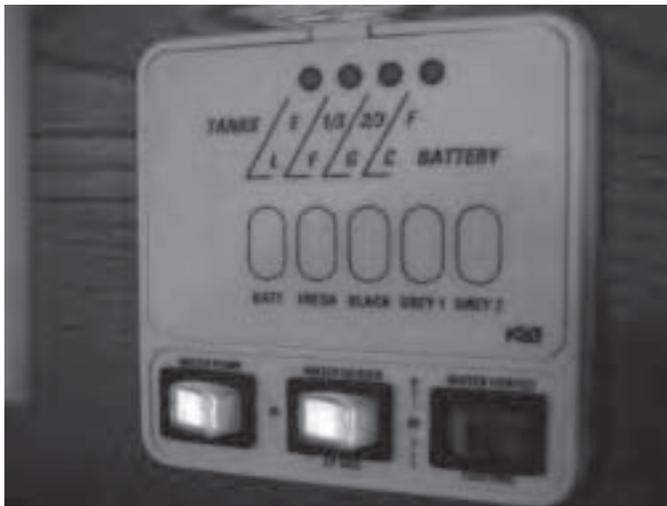
### Waste System

The waste system plumbing is black ABS plastic. The fittings are designed to be tightened by hand. Do not use tools to tighten the fittings.

The P-traps need to have water in them in order to prevent holding tank odors from entering the trailer. After draining the holding tanks, run some water into the traps .

Tighten by hand only.

### Holding Tanks



After draining a black water waste tank (toilet waste), the monitor panel indicator lights may appear to malfunction. Foreign material (toilet paper, grease, hair, etc.) may collect on and adhere to the monitor probes and can cause a false reading. If this happens, flush the black water tank as directed below. Usually, the motion of the trailer on the road and the natural sloshing of the tank contents will keep these materials from sticking to the probes.

1. Wear a pair of latex gloves to protect your hands while handling the waste system.
2. Drain the waste tank as outlined in the Waste Water System chapter.
3. The tank can be flushed through the toilet if a flushing system is not installed.
4. Connect a water hose (NOT the fresh water supply hose) to a city water supply. Hold open the toilet

flush valve and insert the other end of the hose into the black tank through the toilet bowl outlet.

5. Open the black tank dump valve and the final dump valve. Open the city water valve and flush the black tank for approximately two minutes.
6. Close the black water dump valve and final dump valve. Disconnect the waste hose, rinse it, and install the dust cap.
7. Run fresh water into the black tank for approximately 30 seconds to prime the tank. Never leave it unattended. It can back fill into the trailer through the toilet.
8. Turn off the water supply, and remove the hose from the toilet outlet.
9. Rinse, coil and store the flushing hose. Store the waste drain hose. Wash your hands.
10. If the monitor does not read properly, fill the waste tank approximately 3/4-full with fresh water. Tow the trailer to allow the water to slosh and clean the monitor sending probes. Drain the waste tank and check the monitor.
11. If there is still a malfunction, pour 1/2-cup of muriatic acid (pool acid) into 4 gallons of water in a 5-gallon pail. Pour the mixture into the toilet to thoroughly mix the solution. Fill the tank through the toilet and let it stand overnight. Drain and flush with clean water.

### **WARNING**

*Do not pour water into acid. Always pour acid into water. A chemical reaction may occur that could result in personal injury.*

### Exterior and Chassis

Every 90 days, thoroughly inspect the roof sealants, sealants around windows, exterior doors, cargo doors, fittings and moldings. Reseal annually. Inspect the chassis frame rails and components. Check for loosened bolts. Look for bent or dented parts. Check visible wiring. Look for damaged wiring. Look for loosened connections. Check the tires and wheels. Be sure tires are properly inflated and wheel lug nuts remain torqued correctly to the specification. Open exterior storage compartments regularly and ventilate. Look for any signs of water intrusion. Reseal as required or ask your dealer for assistance.

## Interior And Furnishings

Thoroughly ventilate the interior when using the trailer. This will reduce the effects of condensation that could damage walls and fabrics. Wipe up spills and excess moisture from floors and carpets. Vacuum frequently to enhance carpet performance.

Close window shades when the trailer is stored in direct sunlight to minimize possible fabric and carpet fading. When storing your trailer for long periods, empty all foodstuffs from cabinets and the refrigerator, especially during freezing weather.

### NOTICE

*Do not leave the trailer unattended for an extended period with city water connected and under pressure. Turn it off when the trailer is unattended. A water pressure regulator is recommended.*

### ! CAUTION

*When storing the trailer, close the propane tank valves to the off position.*

### NOTICE

*Do not leave the gravity water fill unattended when filling. Damage may result. Fill the fresh water tank slowly. Let the air escape to prevent any possibility of over expansion of the fresh water tank.*

## Plumbing & Propane Systems

Frequently open cabinets and plumbing access panels to look for any signs of plumbing leaks or water intrusion.

Over time, road dynamics from towing may cause some plumbing fittings to loosen. This is normal. You can easily tighten most fittings by hand or with basic tools to stop or prevent minor leaks. Check and clean the fresh water filter at the water pump regularly. When reinstalling the filter housing, be sure it is tight, run the fresh water pump and check for any leaks.

If you store your trailer in freezing weather, completely drain the fresh water plumbing system, water heater, toilet, ice maker, and holding and fresh water tanks. See your dealer for the proper winterization procedure. Visit your trailer while it is in storage. Inspect for anything unusual.

Check the propane gas tank hold down bracket. Be sure it is tight before towing your trailer.

Each time your propane tanks are filled, check the propane hose fittings at the tanks. Tighten them securely, but by hand only.

### ! CAUTION

*(Ramp/ "Toybox" trailers): When loading the trailer, load 60% of the cargo over or forward of the centerline of the axle(s). Overloading and unbalanced loads may cause towing and handling problems or create an unstable towing condition. This can result in damage to the trailer, the towing vehicle and cargo.*

### ! CAUTION

*(Non-ramp conventional trailers) Overloading and unbalanced loads may cause towing and handling problems or create an unstable towing condition. This can result in damage to the trailer, the towing vehicle and cargo. Load evenly from side to side and front to back, keeping heavy items near the floor and directly over or as close to the forward-most axles as practicable.*

There are many other maintenance items that are covered in your Owner's Manual and the equipment operating guides for many of the components in your trailer.

**REQUIRED MAINTENANCE SCHEDULE**

ITEM	EVERY TRIP	MONTHLY	EVERY 3 MONTHS	EVERY 6 MONTHS	ANNUALLY	BEFORE/AFTER STORAGE	AS REQUIRED	<b>PROCEDURES TO BE PERFORMED</b> : Maintenance schedules are minimum requirements. Extended use, extreme temperatures, high humidity or other extreme conditions will require more frequent maintenance.
Roof & Roof Attachments			X			X		Inspect sealant for voids/gaps/cracks & reseal
				X		X		Clean Roof (see Section 21)
					X	X		Clean & Lube roof vent mechanisms w/light oil
Exterior Moldings (all)			X			X		Inspect sealant for voids/gaps/cracks & reseal
Windows (exterior)			X			X		Inspect sealant for voids/gaps/cracks & reseal
				X		X		Clean & clear weep holes at bottom of frame
Exterior Fiberglass/Metal			X			X		Wash w/warm water & mild detergent (see Sec. 21)
				X				Apply non-abrasive wax (except on decals)
Frame/Underbelly					X	X		Check for damage, loose wires, debris, etc. & clean
			X			X		Check frame for rust and touch up as necessary
Axles/Suspension				X		X		Check U-bolts, springs & hangers for damage
					X	X		Check torque-all bolts (see axle MFG. guide for specs)
Brakes/Wheel Hubs					X			Check amp draw/shoe wear/adjustment (see dealer)
					X		X	Lube bearings (as needed)
Wheels/Tires	X					X		Check wheel lugs for proper torque (see Section 6)
			X			X		Inspect tires for wear
	X					X		Check tire inflation pressure (see tire label for PSI)
Entry Steps				X		X		Clean and lubricate (lithium spray)
Baggage Doors		X				X		Confirm that doors seal tight and are not leaking
				X		X		Spray lock tumblers with dry graphite
Entry Door	X					X		Make sure door latches & locks (incl. dead bolt)
				X		X		Lubricate hinges w/light oil or WD40 (or comparable)
				X		X		Adjust screen door and latch
Awning (s)				X		X		Wash w/warm water & mild detergent (see Sec. 21)
					X	X		Clean & lube arms (moving parts) w/WD40
Appliances					X	X		Check settings & adjustment per manufacturers guide
		X				X		Make sure burner tubes/vents are clean/unobstructed
					X	X		Clean and sanitize
Safety Equipment	X			X		X		Check operation of detectors-R&R batteries every 6 mo.
					X			Test & check fire extinguisher
Plumbing System			X		X	X		Check hoses, fittings, pipes for leaks - tighten as req.
					X	X		Lubricate termination gate valves (WD40 or Lithium)
					X			Winterize system (depending on location)
Electrical System	X		X			X		Check & service batteries
			X		X	X		Test all GFI outlets
					X	X		Service generator (if equipped) per mfg. manual
LP System					X			Have system tested for leaks by qualified dealer
					X			Have pressure & regulator setting checked by dealer
Slide Rooms			X			X		Clear debris from roof/side - check seals & clean
Hitch/Coupler/Chains					X	X		Check for damage & wear - clean & lubricate (grease)

## 22. Storage & Winterization

The checklists and procedures in this section will help you take a systematic approach to preparing your trailer for storage in cold-weather conditions. These checklists do not include every detail required. You may want to expand them to suit your needs or perform the tasks in an order that suits your situation. These steps are not necessarily presented in the order that you should do them. Other manuals included with your trailer may contain more detailed procedures for some of the items on these checklists. Contact your dealer or Dutchmen for additional suggestions suitable to your climate and storage conditions.

### Chassis

If possible, select a storage area that is dry, well-ventilated and protected from wind and sunlight. A garage would be ideal, but a protected outdoor area will work.

Lubricate all grease fittings on the axle hubs.

Check all tires for damage and set tire pressure to the maximum as indicated on the tire sidewall. Clean the tires and wheels with your regular soap/car wash solution. It is not necessary to treat the tires with any commercial tire dressing.

Wash the trailer underside. Hose off any accumulations of mud and/or road salts on frame, axles, and other chassis components. This is also a good time to inspect the underside of the trailer. Look for obvious damage, and for small cracks, separations, or openings in storage compartments. Check for any damaged components or wear.

Park the trailer as level as possible front to rear and side to side. Use blocks or ramps under the wheels, if necessary.



Be sure the breakaway switch activating pin is secure in the switch. Coil and stow the 7-way power cord.

Grease the hitch king pin (5th-wheels) to prevent rust and corrosion.

Block the tires front and rear. Cover tires with cloth, plywood, or aftermarket tire covers to protect them from ultraviolet exposure from the sun (if stored outdoors).

Check tire pressures every 30 days during long-term storage. Maintain the maximum rated cold inflation pressure.

### Body/Exterior

Close all vents and windows, and thoroughly wash the exterior, including roof, sidewalls and front and rear caps. Be sure to remove all debris, road grime, bugs, tree sap, bird droppings, etc.

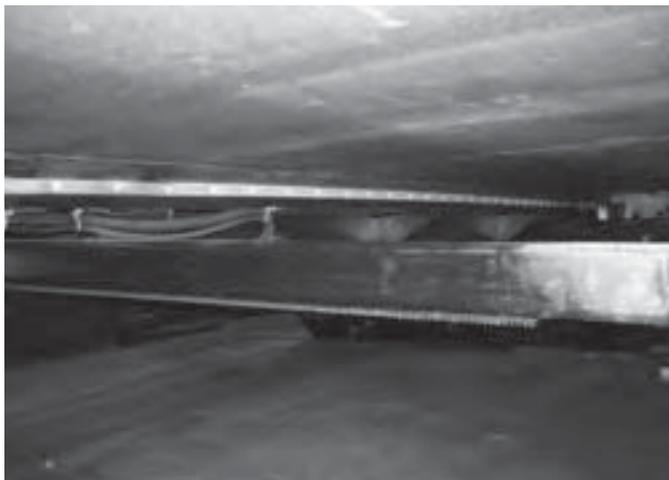


While washing, make note of any maintenance that may be needed. Closely inspect the sealants around roof accessories (vents, antennas, racks, etc.), windows and doors. Reseal as necessary before winter rains or snows accumulate.

Cover all exterior appliance vents (water heater, furnace, refrigerator, range hood) to prevent insects, small birds or other creatures from getting in.

Extend the awnings (if equipped). Sweep or vacuum away branches, leaves, and any other debris. Wash both the tops and bottoms of the awnings with a mild, natural soap. This will help reduce the growth of mildew on the awnings. Allow them to dry completely before retracting them. After they are dry and still extended, spray a light coat of silicone-based lubricant on all metal moving parts.

Extend the slide-outs (if equipped) and prepare them for storage:



1. Wipe down all exposed mechanical slide components: gears, rails, shafts, etc. Look for any damage, or caked accumulation of grease and dirt. Remove any of this accumulation.

2. Check the exterior rubber slide-out seals. Look carefully for any tears or splits in the seals. This would be a good time to have repairs made. Clean the seals with soap and water. After cleaning, apply a coating of protectant to the seals. Use clean cloths to spread the protectant evenly over the surface of the seal. Allow to air dry.
3. Leave the slide-outs extended for now. Retract them after your interior preparation is completed.

Check inside all exterior compartments. Remove anything that you don't intend to store. Vacuum out the compartments and carefully wipe down components inside. Look over any exposed wiring. Check for loose connections or damaged wires. Make any repairs now. Wipe down the rubber seals around the doors and apply protectant. Lock all exterior compartments (except propane compartment). Lubricate locks, hinges and latch mechanisms with silicone-based lubricant.

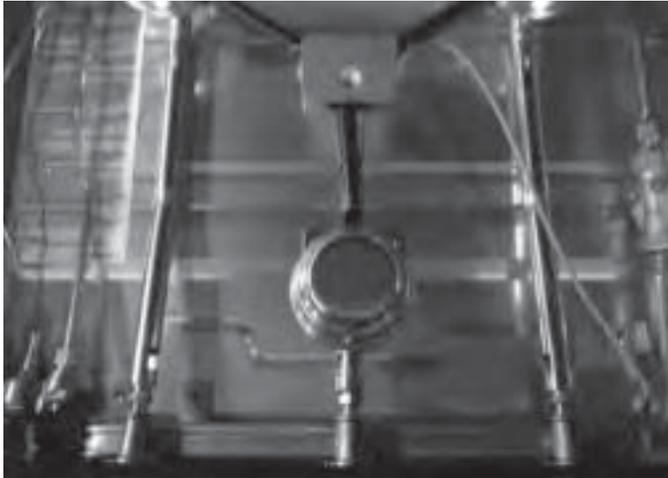
If the trailer is parked outdoors, remove any high grass and weed accumulation under and around the trailer.

### Propane System



Turn off all propane appliances: refrigerator, range/oven, water heater, furnace.

Close the main outlet valves on the propane cylinders. Cover the regulator and cylinders to keep moisture out. Remove all food from the refrigerator and freezer. Wash down the interior walls with a mild soap solution. An open box of baking soda or other absorbent inside will help reduce odors. Block the doors open slightly to allow air to circulate.



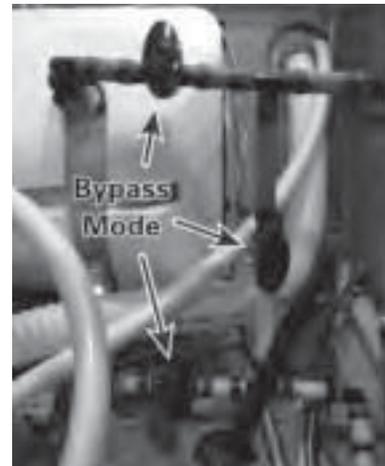
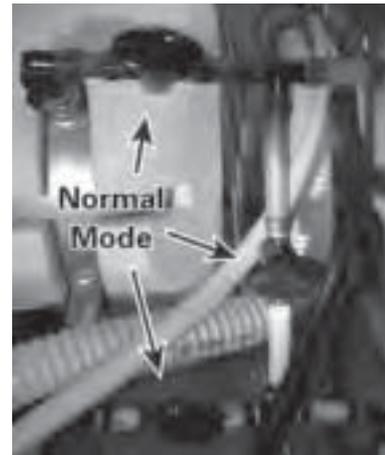
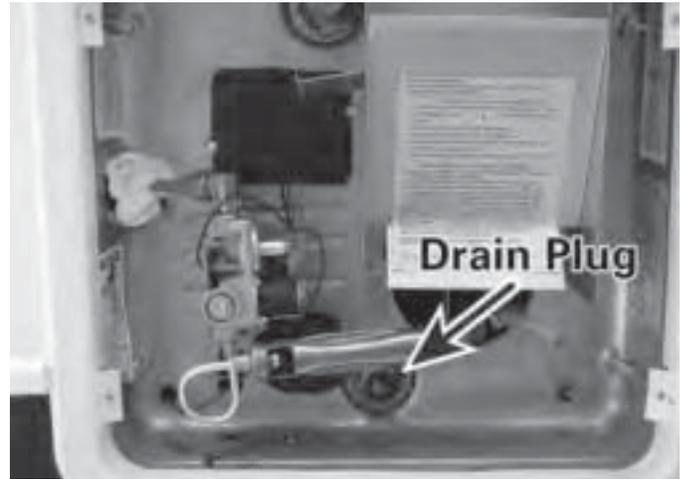
Turn off the range and oven burners. Clean the top and oven interior. Turn off any pilot valves.

### Plumbing Systems

#### **! WARNING**

*Use only RV water system antifreeze for winterization. Do not use automotive coolant antifreeze (ethylene or propylene glycol). Automotive antifreeze is poisonous. Consumption of ethylene or propylene glycol could be fatal.*

Proper preparation and winterization of the fresh water and waste water systems is vital to the continued safe and effective operation of these systems. Freezing water expands and can rupture tubing, fittings, tanks, and fixtures. Damage from freezing could be extensive and very expensive to fix. Since you will be running water and antifreeze solution through the drain piping into the gray and black water holding tanks, we'll winterize the fresh water system first, and finish the job with the waste water system. Be sure to dump the holding tanks before starting winterization.



#### **NOTICE**

*Be sure the water in the water heater is cool before beginning winterization.*

Turn off the water heater and let it cool. Turn off the water heater electrical circuit breaker to prevent accidental operation with a dry tank. To drain the water heater, remove the plug at the bottom of the heater and open the pressure relief valve near the top of the heater. When all water is drained from the heater, close the pressure relief valve and replace the drain plug. Set the

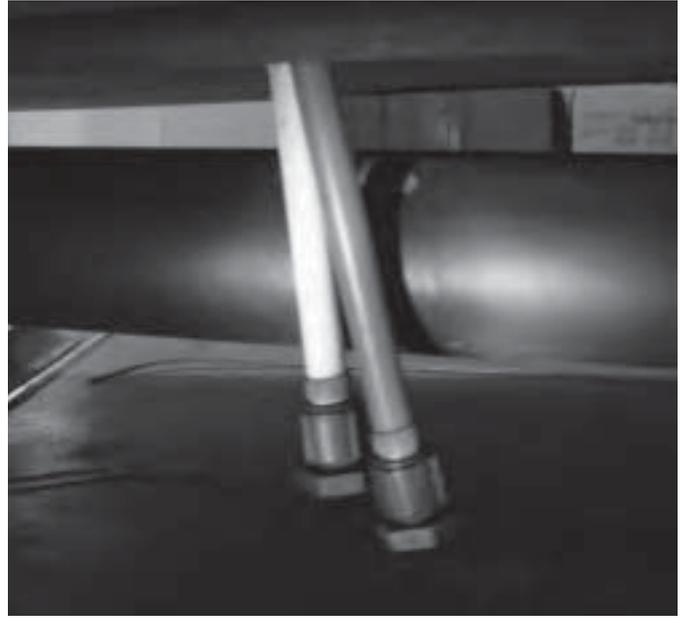
water heater flow valves to bypass mode to prevent filling the water heater with antifreeze.



Open the tank drain valve to drain the fresh water tank. If you have a full or nearly full tank, be prepared for the full capacity of the tank to drain. Close the valve when the tank is completely drained.



Open all faucets, both hot and cold, in the galley, bathroom and shower. Open the shower head valve. This will allow the water in the lines to flow to the low point drains.



Open the system low point drain valves. These are the lowest points in the water system. The low point drains are located under the trailer. Drain out all water. Close the low point valves when ALL water is drained.

Press the toilet flush pedal to completely drain the water from the toilet.

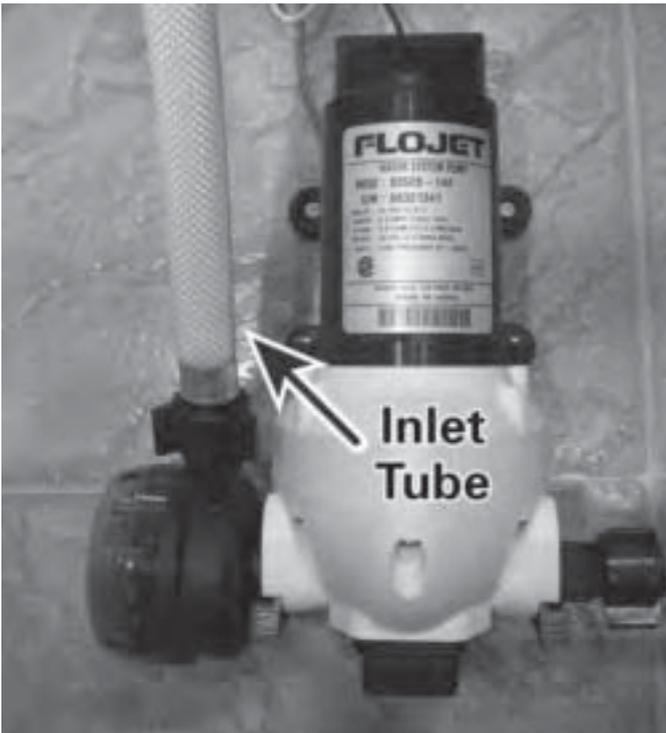


Remove the water filter cartridge, if equipped. If you are draining for storage, do not reinstall the filter cartridge. Store the cartridge in a safe place. Turn off the supply valve to the filter.



Disconnect the outside shower hose (if equipped) and drain the hose. After all water is drained from the hose, reconnect hose.

### For Storage In Freezing Conditions:



Add potable RV antifreeze to the system. Dutchmen recommends disconnecting the water pump inlet tube and pumping antifreeze from a container into the system.

1. Close the fresh water tank drain valve and the low point drain valves. Close all faucets, and be sure the water purifier (if installed) supply valve under the galley is closed.
2. Disconnect water pump inlet line. Attach a 3' or 4' length of hose to the pump inlet port, and put the other end of the hose into at least a one-gallon

container of RV water system antifreeze. Do not use automotive coolant system antifreeze.

3. Be sure the trailer 12-volt electrical system is activated. Turn the water pump ON to pressurize the cold side of the fresh water system. Pump about a gallon of antifreeze into the system. Put the free end of the hose into another container of antifreeze. Open each faucet – lavy, shower, galley, exterior shower and wash-up faucets – until the antifreeze solution flows freely. Close each faucet when you see the antifreeze. Open the toilet water inlet valve and activate the toilet flush valve so antifreeze gets into the toilet. With the system pressurized, press the check valve in the city water inlet until antifreeze flows out.
4. Open the low point drain valves until you see antifreeze flowing out, then close the valve.
5. Turn off the water pump, disconnect the temporary hose, reconnect the inlet tubing and open all faucets.

### Winterize the Refrigerator Ice Maker (If Equipped).

1. Push the ice maker arm up to the OFF position.
2. Remove the vent from the exterior side of the trailer.
3. Close the water shutoff valve for the ice maker.
4. Place a shallow pan under the water solenoid valve.
5. Disconnect the water supply line from the water solenoid valve. Drain the water from the supply line.
6. Unscrew the plastic nut and disconnect the water line from the outlet side of the water solenoid valve. Drain the water from the ice maker line.
7. Reconnect both lines to the water solenoid valve in their original locations. Leave the water shutoff valve closed.
8. Dry out the ice maker mold assembly with a soft cloth.
9. Remove the white ice maker AC power cord from the outlet.

Be sure water pump and water heater switches are OFF. Clean up around the dump valves and fittings. Be sure the dump hose is clean and dry. Pull off the termination caps, clean around the sealing rings and reattach them. Cycle the dump valves a couple of times. Spray

a silicone-based lubricant on the actuating shafts and mechanisms.

Pour one or two cups of RV antifreeze down each sink, and shower drain. Pour a couple of cups into the toilet, and operate the flush valve.

Cap the holding tank drain, city water inlet, and fresh water fill inlet. Coil and store the fresh water hose, waste hose and flushing hose.

### Preparing The Electrical Systems For Storage

Preparing the electrical systems for storage mainly involves the batteries and the generator (if equipped). Properly storing the batteries will ensure that they will be able to power up your systems when you take the trailer out of storage, and that you get the maximum life from the batteries.

Turn the power supply disconnect switch off.



If possible, remove all batteries and store them in a warm, clean, dry location. Arrange them in a way that allows you to get to them for periodic recharging during the storage period.

If you can't remove the batteries, disconnect the cables and clean the terminals. Remove any dirt and/or acid buildup. Clean the tops of the batteries and dry thoroughly. Reattach the cable, and apply a battery terminal protectant.



Check the charge in each battery with a hydrometer. Be sure the specific gravity in each cell is no less than 1.260. Recharge as necessary. A fully charged battery will not freeze until 50 or 60 degrees below zero, but a partially discharged one may freeze at only 20 degrees above zero. A frozen battery is a ruined battery. Checking the voltage is not a good way to determine battery charge. A battery that measures 12 volts is already 75% discharged. A fully charged battery will measure about 12.63 volts at 77 degrees F. The hydrometer/specific gravity method is the best way to determine battery charge level.

Check the charge in the batteries every 30 days. Recharge to specific gravity of at least 1.260.

Change the oil and oil filter in the generator (if equipped). Turn off any unnecessary DC and AC loads. Turn devices off and open the main battery disconnect switch.



Unplug all 120-volt AC appliances. Turn off all AC breakers, including the main breakers at the main panel. You may want to do this after all interior prepara-

tions have been completed, leaving it as one of the last things you do.

Clean and re-coil the shore power cord. Check the plug end of the shore power cord. Clean the prongs with electrical contact cleaner or a ScotchBrite® pad.

### Interior

Thoroughly clean the interior. Remove all traces of food, including pet food. Vacuum in and under cabinets. Remove all canned goods and personal items if they contain liquids that will freeze. A burst can or jar of food can be a real mess to clean up in the spring.

Open closet doors, drawers, and cabinets so air can circulate through. This will help reduce the buildup of condensation and musty odors.

Close and cover all vents to prevent entry of snow, etc.

Close and lock all windows. Turn vent fan and range hood fan switches OFF.

Turn off all radios, TVs, interior and exterior lights.



Close curtains and/or mini blinds, and pull shades. This will help reduce fabric fading from exposure to sunlight.



Remove and clean or replace air conditioner filter.

Remove batteries in clocks and other battery-operated devices such as smoke detectors. Leave the cover off the smoke detector to remind you to replace the battery when reactivating the trailer after storage.

After all cleaning chores are complete, and you are ready to leave the trailer, do a walk-through to make sure you haven't forgotten something.

When exiting the trailer, close and lock the entry door, and retract the entry step.

Check the condition of the trailer weekly.

During long-term storage in warmer climates, operate the air conditioning system (if equipped) periodically to lubricate the compressor seals. Operate the slide-out(s) several times to keep seals from sticking, and to lubricate the mechanism. Reconnect batteries or connect to shore power.

### Reactivating The Trailer After Extended Storage

If the trailer was properly and carefully prepared for storage, getting it ready for another travel season should not be difficult. The following checklist assumes that you stored the trailer with care. If damage from freezing or other serious deterioration has occurred, please consult with your dealer or Dutchmen for advice on how to get your trailer back to operating order.

If you have added checklist items of your own, make sure those items are covered as you prepare your trailer for travel.

- Thoroughly inspect the outside of the trailer. Look for animal nests in wheel wells, in compartments, or in other out of the way places.

- Remove all appliance vent covers, roof vent covers, or other coverings. Be sure all furnace, water heater, and refrigerator openings are clean and free of debris.
- Open all doors and compartments. Check for animal or insect intrusion, water damage, or other deterioration.
- Check charge level in all batteries. Refill and recharge as necessary. Reinstall batteries, if necessary. Be sure cable ends and terminals are clean and free of corrosion. Always install the positive (+) cable first. Close the main battery disconnect switch.
- Check tire pressures. Reinflate to specified cold pressure. Lube chassis.
- Check all exterior lights, and replace bulbs as necessary. Remove covering from inside windows.
- Open vents and windows for interior ventilation.
- Drain, flush and sanitize the fresh water system as outlined in the Care and Maintenance chapter. Inspect the drain hose for leaks. Replace the hose if necessary.
- Install a new fresh water filter cartridge (if equipped).
- Operate all faucets and fixtures in the fresh water system.
- Check for leaks at all joints and fittings. Repair any leaks.
- Check all 12-volt DC circuit fuses.
- Operate all 12-volt DC lights and equipment.
- Install new batteries in battery-operated devices. Check the operating guides for these devices for additional operating information.
- Test the carbon monoxide, propane and smoke detectors and alarms.
- Check the monitor panel operation.
- Open and operate vents and vent fans, including the range hood fan.
- Inspect the 120-volt AC electrical system. Check the shore power cord, converter, all outlets, and any exposed wiring. If defects are found, refer service to your dealer.
- Prepare the generator (if installed) for operation following instructions in the generator operating

manual. Make sure the main circuit breakers are off.

- Start and run the generator (if equipped). Check the generator exhaust system for leaks or deterioration. Operate 120-volt appliances and trailer air conditioning system (if equipped).
- Inspect the propane system and check for leaks as described in the Care and Maintenance section. If the propane cylinder(s) appear rusted or corroded, have them inspected by a qualified propane service center.
- Operate each propane appliance. Observe all burner/pilot flames for proper color and size.
- Inspect and clean the interior.



- Check sealants around all roof and body seams and windows. Reseal, if necessary, as outlined in the Care and Maintenance section.
- Wash and wax the exterior. Inspect the body for scratches or other damage. Touch up or repair as necessary. Flush the underside of the trailer thoroughly.

### Severe Weather Use

Your RV was designed primarily for short-term use in moderate temperature and climate conditions. Generally, this means in temperatures between 0 degrees F. and 110 degrees F. There may be situations when you may choose to use the RV outside of this range. But you must be aware that the plumbing systems, heating and cooling appliances, and structural components of the RV are not appropriate for long term use in either the coldest or warmest climate conditions.

Before you consider using your RV in temperature extremes, please take time to read this section. We've

provided some guidelines for operating various systems and appliances in either very cold or very hot weather. We've also provided some life-style tips if you intend on using your RV in temperature extremes. Please also be aware that although the components and appliances in your RV will perform very well within their design specifications, damage to components, appliances or RV structural materials while used in severe weather conditions may not be covered under the warranty. If you intend to store your RV during severe winter weather, please see the "Storage and Winterization" section of this chapter. Operating and living in your RV during the winter requires some preparation and additional equipment and materials. You will also need to learn to more closely manage your electrical and propane resources.

Successfully using your RV in extreme cold temperatures generally means doing three basic things: 1) keeping heat in, 2) keeping cold out, and 3) adding heat where it's needed. This guide will give you a few tips on dealing with those three basics.

### **Plumbing Systems**

Of all the systems in your RV, the fresh and waste water plumbing will require the most attention during extreme cold weather use. Freezing can cause extensive damage to the plumbing that can be very costly to repair, and will not be covered under warranty.

The fresh water and waste tanks, and most of the plumbing pipes and fixtures, are not always in heated compartments. Even heated underbellies cannot protect against freezing in extreme cold conditions (below zero). The plumbing pipes run through the walls or under the floor. Some are exposed to the outdoors and can freeze.

Know where all of the plumbing on your RV is located. Take a close look around and find where your tanks, outdoor fixtures, indoor plumbing, drain valves, and water pump are located. Look under the RV and in all the compartments. The plumbing components that are exposed to the outside are much more prone to freezing since they are directly exposed to outdoor air temperature. Aftermarket accessories (tank heating pads, heat tape, etc.) are available for extreme cold conditions, however there is no guarantee they will prevent freeze-up.

### **Keep the heat in**

Look all around the outside underside of the trailer. Wherever you find plumbing fixtures, piping, etc. is a good place to stuff in insulation material such as fiberglass wool. Look especially for pipes where they enter through the floor or sidewalls. Those are good places to put extra insulation. And don't forget to keep the interior of the RV heated. If you're expecting extremely cold temperatures, open cabinet doors and drawers in the galley and bathroom. The plumbing fixtures are closer to the outside walls in these areas and will freeze faster. If you leave the doors and drawers open, the interior heat will have a chance to keep the plumbing above freezing.

### **Keep the cold out**

Exterior utility compartments are directly exposed to outside temperatures. The exterior compartment (if equipped on some models) can be stuffed with insulation if you don't have to get into it often. You can also cut out pieces of foam insulating material to fit inside the door to help keep out the cold.

If you are going to be situated for several weeks or months during severe cold weather, consider installing insulated underskirting all around the trailer. Small ceramic heaters and heat tape can be used under the trailer and around plumbing components. Try to seal up as many gaps as possible to keep cold winds and snow from getting under the trailer.

Add heat where it is needed.

The most effective way to protect the water tanks, water pump, fresh and waste water plumbing is to add heat in the areas where it is needed.

Keep the compartment doors closed. Foam insulating material can be cut to fit inside the compartment doors and help keep the heat inside. Check inside occasionally to make sure everything is okay.

If you have AC power available, wrap the fresh water inlet plumbing and waste lines with heat tape. Plug the heat tape into an extension cord. Be sure to follow all installation and use instruction provided by the heat tape manufacturer.

### **A few more tips:**

Thoroughly drain water from hoses before you store them. If you don't and you need to use a hose, it will

probably be frozen. You can take hoses inside to thaw out, if need be, or use a hair dryer.

Drain holding tanks before they are completely full during cold weather camping. This will reduce the chance of freezing, resulting in damage to the holding tanks.

Leave the water heater turned on whenever the water heater tank is full so there is no chance of it freezing.

Depending on your travel situation, you might consider traveling with the water system winterized. Take bottled water along for drinking and other needs like cooking, washing up and brushing your teeth when the RV is winterized. Even with the fresh water system winterized, you can still use the bathroom facilities. Gallon jugs filled with water can be used in the toilet. If your holding tanks are not heated you can put some RV antifreeze in the holding tanks to prevent the contents from freezing. Add the RV antifreeze through the toilet for the black water holding tank and down the shower or tub drain for the gray water tank. The antifreeze will also protect the shower or tub P-trap which is usually located below floor level. The amount of antifreeze required for the holding tanks will be based on the size of the tanks, and it will be necessary to add more RV antifreeze as waste water is added to the tanks to prevent the antifreeze from being diluted.

### Electrical System

#### **WARNING**

*Do not under any circumstances operate any engine or motor while sleeping. You would not be able to monitor outside conditions to assure that engine exhaust does not enter the interior, and you would not be alert to exhaust odors or symptoms of carbon monoxide poisoning. Breathing carbon monoxide could result in serious injury or death.*



The batteries and generator (if equipped) will be your primary electrical system concerns. If you are connected to shore power, you will likely have all the power you need to operate appliances and the battery charger. You will also have the necessary power if you have a generator that you properly prepare for extreme temperature operation. This will mean making sure the correct weight of oil is installed and the engine is in good tune. Preparing the generator for cold weather is relatively inexpensive. But if you can't get it started or if it fails during extremely cold weather, it is no better than not having a generator. Be sure it is well-prepared for the traveling conditions you expect.

If you expect to dry camp – that is without the benefit of shore power or a generator – the batteries are the most critical part of the electrical system since they will be your only source of electrical power.

If the batteries are not kept fully charged, they will freeze. If they freeze, they will be destroyed. You must measure specific gravity with a hydrometer to determine battery state of charge. A voltage reading will not give you useful information. A battery that measures 12 volts is already 75% discharged. If the battery measures below 12 volts, the battery will freeze at a much higher temperature.

The batteries, fully charged, will not last more than about 10 hours in zero-degree weather depending on battery condition and 12-volt loads. In extreme temperatures, don't plan on relying on batteries for longer than this unless you have a means to charge them. If you expect to stay longer than overnight, you should expect to either have 120-volt AC power nearby or run the generator (if equipped). Minimize your use of electric power if AC power is not available or you cannot

run the generator. Without shore power or a generator to run the charger, you can charge batteries with your tow vehicle alternator through the 7-way connector charge line. If you do this, monitor battery charge with the monitor panel or measure specific gravity with a hydrometer.

Cold weather preparation for your RV batteries is the same as for your car or truck: keep them clean, keep the electrolyte level correct, and keep the cables and terminals clean and dry. A battery terminal protectant spray or paste can help keep corrosion to a minimum.

### Running Gear And Body

Prepare your RV chassis, running gear and body as you would your car or truck. A good coat of wax will help protect the exterior panels. Be sure tires, bearings, brakes and exterior lighting are all in good operational condition. Many locations use corrosive substances to de-ice roads. Whenever you can, use fresh water to flush the undercarriage and rinse off accumulations of mud and road salts.

Before traveling in severe weather, do a thorough inspection of exterior sealants. Water that gets into walls or under the roof area can cause severe damage. Open seams or moldings can become filled with water and freeze causing even more damage from expanding ice.

Be sure roof vents, furnace, refrigerator, water heater exhaust vents and the generator exhaust system are not damaged and are functioning properly. Faulty exhaust vents can allow the buildup of deadly carbon monoxide.

### Interior

Outside of comfort heating, humidity and condensation will be your main concerns during cold weather. Moisture buildup on walls, the ceiling, and even in closets can cause damage and lead to mold and mildew formation. This Owner's Guide has a detailed section on humidity and condensation control. Please see that chapter for more information as you plan your cold weather RVing activities.

Cold weather comfort involves the same three basics as keeping your plumbing systems working: 1) keeping heat in; 2) keeping cold out; and 3) adding heat where it is needed.



The best heat source is the RV's forced air furnace. It will consume more propane than any of the other propane-fired appliances. The propane tank or cylinders should be full before leaving on your trip. Monitor the propane supply carefully during your stay.

### Keep the heat in

Much of the heat inside your RV will escape through the windows. Cover the windows with curtains, drapes or almost anything to help hold some of the heat in. Foam or other insulating material cut to fit the windows can help cut down on heat leakage during the night. Several plastic films are available that can be applied to window frames with adhesive and then shrunk with a hair dryer that will act like storm windows to help keep the heat in and help reduce the formation of condensation on the window glass.

You can stuff insulation or heavy cloths into the slide-out mechanisms and other openings that will help reduce drafts.

Use overhead and range vents to reduce the humidity inside the RV. A cross-flow of outside fresh air using the overhead vents will be better at conserving heat than opening windows or exterior doors. In very severe weather, you can cover or block the insides of roof vents with plastic or foam insulation.

Weather-strip doors and windows. Cold little drafts in your main residence are annoying; they are much more serious in a recreational vehicle.

A few throw rugs over un-carpeted flooring can add another thermal layer.

When you arrive at your destination, try to select a site that will be exposed to the sun throughout the day, but also where there is some type of wind break available. Position the RV on the site so the front or rear rather

than the side will be facing into the wind, and if possible, situate so that the side with the utility connections (water, sewer, electrical) is on the sunny side.

### Keep the cold out

The best way to keep the cold out is to avoid opening doors and windows. Avoid opening the entry door as much as possible.

Block off sections of the RV you won't be using with blankets or sheets. The more heat where you are the better. That doesn't mean that you shouldn't heat parts of the RV, just keep most of the heat in the areas where you will be spending most of your time. Check all around doors, windows and other openings for drafts or cold air. Block these areas with blankets, carpet or other insulating materials to help keep the cold out.

### Add heat where it is needed

There may be times in exceptionally cold weather when you will have to add heat to the interior. If you are connected to shore power or can operate a generator, use low-wattage electric ceramic heaters for spot heating an area. Never use the range or oven for interior comfort heating. These appliances produce deadly carbon monoxide when they are operating. If you use electric heaters, be sure to follow all instructions. Do not place the heaters near upholstery, clothing or other flammable materials.

If you have 120-volt power at your site, turn on the tow vehicle engine block heater (if equipped) overnight to ensure the engine will be warm for a quicker start in the morning.



*It is not safe to use cooking appliances for comfort heating. Cooking appliances emit carbon monoxide which is poisonous and could result in serious injury or death.*



*Some upholstered components and mattresses, carpet, and insulation products are made of urethane foam. Urethane foam is flammable and gases released while burning could result in personal injury or death.*

Urethane foams burn rapidly, releasing great heat and consuming oxygen very quickly. Lack of oxygen is a danger of suffocation hazard. Hazardous gases released

by the burning foam can be incapacitating or fatal to human beings if inhaled in sufficient quantities.

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

### Personal Comfort And Safety

Extreme temperature and weather conditions require that you prepare yourself for the conditions you may encounter. Extreme cold weather is often experienced in places where the weather can change rapidly. Watch for sudden weather changes. Always carry a survival kit in your vehicle. The kit should contain flashlights, batteries, rain ponchos, a portable weather radio, first aid kit, nonperishable packaged or canned food and a manual can opener, blankets, prescription and non-prescription drugs, pet supplies, bottled water and any special items for infants, elderly or disabled family members. What you put in this survival kit is up to you, but be sure to include everything you might need.

You must be prepared with appropriate clothing, fuel supplies and food. Adding these extra severe-use items may affect the load you carry in your RV and how you load it. Equip your tow vehicle with snow tires or have tire chains available when conditions warrant their use. Watch for ice on roads and trails. Always obey posted speed limits and proceed with caution.

No matter what extreme weather conditions you may encounter – whether extreme heat or extreme cold – remember that you may be isolated. You may be far away from food and fuel supplies, other RVers, and emergency help. If you have cell phone service, be sure your service is usable in the areas where you intend to travel. Always tell someone where you are going, how long you plan to be gone, and how to contact you in case of emergency. An aftermarket GPS system can be a good emergency preparedness investment.

### Weather Planning

Many RVers do not take into consideration the weather conditions at their travel destination. When you travel several hundred miles a day in your RV the weather conditions can change several times. The weather is often the last thing on your mind. Severe weather can occur without much warning, and if you are caught in it, it can be disastrous. RVers need to have an emergency plan in case of a severe storm.

**The National Oceanic Atmospheric Administration**

(NOAA) Weather Radio (NWR) is a nationwide network of radio stations that broadcast continuous weather information directly from a nearby National Weather Service Office. They broadcast National Weather Service warnings, watches, forecasts and other hazard information 24 hours a day. Alerts inform people if they need to take some type of action in order to protect themselves.

Consider both a portable GPS unit and a weather radio receiver as part of your travel gear. Receivers are available in many price ranges depending on the quality of the receiver and its features. It is well worth the investment to be able to pinpoint your exact location and to know what type of weather to expect when traveling or camping in your RV. For more information on the NOAA Weather Radio visit their website at [www.nws.noaa.gov](http://www.nws.noaa.gov). It is a good idea to monitor the weather radio while traveling. Develop an emergency evacuation plan in case of severe weather.

When you arrive at a campground, ask about emergency plans in case of a severe storm such as a tornado, or a thunderstorm with high winds. If the campground doesn't have a plan, you need to make your own. Locate a structure that is safer than your RV, like a bathhouse or the campground office. Always stay on the lowest level possible and away from doors and windows. Tell everyone who is with you about the emergency plan. Explain to children how to respond to different disasters and the dangers of severe weather, fires, and other emergencies. Instruct children on emergency exits. Instruct them on how and when to call 911 or other emergency phone numbers.

Make sure everybody knows exactly what his or her job is in case of severe weather. Monitor the weather radio for emergency information. Emergency weather watches and warnings are posted for counties and towns, so always check a map for the county or town where you are staying.


**WARNING**

*Travel trailers are high-profile vehicles and are subject to the effects of wind. Loss of control in high winds could result in a crash causing personal injury or death.*

Be aware of and pay attention to wind advisories and warnings in the areas where you travel and/or camp.

Do not use your RV to take shelter during severe weather. Seek shelter when severe weather or tornado warnings are issued.

## Glossary of Terms

**AC Electricity** – Alternating current also known as shoreline power. For purposes of this manual, it refers to 120-volt AC (abbreviated 120 VAC).

**Auxiliary Battery** – For purposes of this manual, the term refers to the 12-volt DC group 27 deep cycle battery (customer purchased) that should be installed in your camper.

**Black Water** – Term associated with the sewage holding tank. The toilet drains directly into this tank.

**British Thermal Unit (BTU)** – Measurement of heat that is the quantity required to raise the temperature of one pound of water 1° F. RV air-conditioners and furnaces are BTU rated.

**Breakers** – Refers to electrical system disconnect devices in the event of a failure (short, ground, open, surge) in both 110 Volt and 12 Volt systems. Breakers for 110V are located in the power panel and at the generator (if equipped). Automatic and manual reset 12V breakers are located in series along major systems wiring (7-way plug-in, slide systems, landing leg systems).

**Break-Away Switch** – Safety device that activates the RV brakes in the event it becomes detached from the tow vehicle. See section in this manual that describes proper use and hook-up.

**Camper** – This term refers to your conventional travel trailer or fifth wheel travel trailer.

**Camping** – An outdoor recreational activity involving the spending of one or more nights in a tent, primitive structure or recreation vehicle at a campsite.

**Campsite** – The term usually means an area where an individual or family might go camping.

**Carbon Monoxide** – A colorless, odorless and poisonous gas.

**Cargo Carrying Capacity (CCC)** – Equal to GVWR minus each of the following: UVW, full fresh (portable) water weight (including water heater), full propane weight and sleeping capacity weight rating.

**City Water** – Term associated with the water supply you hook up at the campsite. It is called city water because water is pulled from a central outside source and not the fresh water tank.

**Curbside** – This refers to the side of the camper that faces the curb when parked. Also referred to as the door side.

**DC Electricity** – Direct current also known as auxiliary battery power. For purposes of this owner's manual, it refers to 12-volt DC (abbreviated 12 VDC).

**Dealer** – Refers to the independent dealer authorized to sell and/or service your camper by Dutchmen Manufacturing, Inc. This term will be used in this context unless specified otherwise.

**Drain Trap** – This is the curve that is in all drains. Water is trapped in the curve and creates a barrier so tank odors cannot escape through the drain. Commonly referred to as a P-TRAP.

**Dry Camping** – Camping when there is no city water hookup or shore power (i.e., using only the water and power available in the camper and not from any other source).

**Dump Station** – Site where you drain your gray water (waste) and your black water (sewage) tanks. In most states, it is illegal to drain your tanks anywhere except dump stations.

**Dump Valve** – Another name for the T-handle valve used to release and drain the black tank (sewage) and gray tank (waste).

**Egress Window** – The formal name for the emergency escape window. Egress windows are identified by their labeling.

**Fresh Water** – The fresh water system provide portable water to the fresh water tank, kitchen sink, shower, bathroom lavatory, toilet, water heater and outside shower.

**Full Hook-Up Site** – A campsite that has city water, shore power and sewer hook-ups or connections available. May also include hook-up for cable and phone.

**Fuses** – Electrical system protection in 12 Volt circuits with various amp ratings. Located in main power center and in-line to major systems.

**Gray Water** – Term associated with the waste water holding tank. Water from the sink drains, shower and washer/dryer (if so equipped) go into this tank.

**Gross Axle Weight Rating (GAWR)** – The MAXIMUM ALLOWABLE WEIGHT each axle assembly is designed to carry, as measured at the tires, therefore including the weight of the axle assembly itself. GAWR

is established by considering the rating of each of its components (tires, wheels, springs, axle), and rating the axle on its weakest link. The GAWR assumes that the LOAD IS EQUAL ON EACH SIDE.

**Gross Carrying Capacity (GCC) OR Cargo Carrying Capacity (CCC)** – Means the maximum carrying capacity of your camper. The GCC is equal to the GVWR minus UVW. The GCC will be reduced by the weight of fresh water or other tanks, propane, occupants, personal items or dealer installed accessories.

**Gross Combined Weight Rating (GCWR)** – The MAXIMUM ALLOWABLE COMBINED WEIGHT of the tow vehicle and the attached towed vehicle. GCWR assumes that both vehicles have functioning brakes, with exceptions in some cases for very light towed vehicles, normally less than 1,500 pounds. (Check your tow vehicle's towing guide).

**Gross Trailer Weight Rating (GTWR)** – The MAXIMUM TOWED VEHICLE WEIGHT. Each component (receiver, drawbar, ball) of a ball-type hitch has its own rating. Some ball-type hitches have separate ratings when used with a weight distributing system.

**Gross Vehicle Weight Rating (GVWR)** – The MAXIMUM ALLOWABLE WEIGHT of the fully loaded vehicle, including liquids, passengers, cargo, and the tongue weight of any towed vehicle.

**Hard-Side RV** – Industry term for laminated fiberglass exterior walls.

**Hitch Coupler** – Device located at the head of the A-frame for connecting travel trailers to the tow vehicle.

**Hitch Weight** – The amount of the camper's weight that rests on the tow vehicle. It should be approximately 15% with conventional trailers; approximately 25% for fifth wheels.

**Landing Legs** – Support legs located at the front of fifth-wheels for raising, lowering and leveling the front of the RV. System can be operated manually or with electric power.

**Lap Sealant** – Special sealant applied to roof edge moldings and roof attachments as a secondary "pooling" sealant. Available at your RV dealership or through Dicor Corp.

**Low Point** – The lowest point in the plumbing. Drains are placed here so that water will drain out of the lower end of the camper when flushing or winterizing the wa-

ter system. These drains must be closed when you fill the water tank.

**Manual Over-Ride** – Term used for manual operation of select systems in the event of a system failure. Includes slide out systems, landing legs and jacks.

**Net Carrying Capacity (NCC)** – The MAXIMUM WEIGHT of all personal belongings, food, fresh water, propane, tools, dealer installed accessories, etc., that can be carried by the RV.

**OEM** – This refers to the original equipment manufacturer of the individual appliances or components.

**Pin-Box** – Heavy gauge steel box located in front underbelly of fifth-wheel RV's for hitching to the tow vehicle.

**Power Source** – Also referred to as shore power, this refers to the receptacle outlet you are using to plug in your shoreline power cord. This can be a campsite power box or electrical box, a residential receptacle outlet specifically wired for your camper or a generator (customer supplied).

**Primitive Site** – A campsite that may have city water, shore power or sewer hook-ups but not all of them; primitive sites may have no hook-ups or connections at all.

**Pull-Through Sites** - Campsites you can drive through and park (without having to back up into the site).

**Roadside** – This refers to the side of the camper that faces the road when it is parked. Often called the off-door side.

**Sanitization** – Refers to the camper's fresh water system that has been sanitized with chlorine bleach before used or after storage.

**Seven-Way Plug** – Electrical connecting device that transfers 12 Volt power from the tow vehicle to the RV.

**Stab Jacks** – Stabilizer jacks mounted to frame in corners of the RV to stabilize the unit when parked. Not to be used for leveling. Applications include manual crank or power operation.

**Stick & Tin RV** – Industry term for metal sided RV's.

**Shoreline Power Cord** – This is the electrical power cord that runs from the camper to the campsite shore power outlet.

**Sleeping Capacity Weight Rating (SCWR)** – The manufacturer’s designated number of sleeping positions multiplied by 154 pounds (70 kilograms).

**Tire Ratings** – The MAXIMUM LOAD that a tire may carry is engraved on the sidewall, along with a corresponding COLD inflation pressure. A reduction in inflation pressure requires a reduction in loading rating. Tire manufacturers publish charts that establish the load capacity at various inflation pressures.

**Tongue Jack** – Jack located in the front A-frame of travel trailers for raising and lowering the hitch coupler.

**Tongue Weight, Tongue Load, Vertical Load (TWR/TLR/VLR)** – Tongue Weight, Tongue Load, Vertical Load rating are different terms for the MAXIMUM VERTICAL LOAD that can be carried by the hitch UNLOADED.

**Torque** – Force that gives a twisting action. Torque settings are critical for wheel lug nuts and other axle components including spring shackle bolts and U-bolts. Refer to the appropriate sections in this manual for torque specifications.

**Unloaded Vehicle Weight (UVW)** – The WEIGHT of a vehicle as built at the factory with full fuel, engine (generator) oil and coolants. It does not include cargo, fresh water, propane, occupants, or dealer installed accessories. Sometimes referred to as DRY WEIGHT.

**Weight & Load** – These terms are generally used interchangeably. For the purposes of understanding RV applications, vehicles have WEIGHT, which imparts LOADS to tires, axles and hitches. Scale measurements taken when weighing are LOADS carried by the tires. These measured loads are used to calculate Gross Vehicle Weight (GVW), Gross Axle Weight (GAW), Gross Combination Weight (GCW) and hitch loads.

**Winterized** – Refers to a camper that has been prepared for storage. The water systems have been drained and RV antifreeze has been added to protect the water lines and drains. The low point drains should be in the open position.

## Troubleshooting

### Electrical Power

*No AC power to unit.*

- Check circuit breakers at power center. The 120 Volt circuit breaker may be off or tripped.
- Have a dealer check that there is power to the shoreline receptacle.

### Furnace

*Furnace does not ignite and/or cycles frequently.*

- Check that propane tank is full.
- Remove any obstruction over furnace exhaust.
- Inspect exhaust tube for any obstructions.
- Check fuse in fuse panel and replace if necessary.
- Make sure that return air grill is unobstructed.
- Remove anything that is stored in furnace compartment that could block air flow.
- Check that heat outlet registers are open and that register openings are unobstructed.
- Make sure that 12 Volt power is present.
- Contact Dutchmen dealer if the problem persists.



*Turn thermostat and furnace gas control valve off and contact your dealer or authorized service center. DO NOT attempt to repair or adjust the furnace yourself.*

### Generator

*Starter engages while holding the start button down, but generator does not start.*

- Generator may be out of fuel. (Generator will not operate when the fuel tank is less than ¼ full).
- Generator may be low on oil. Check the oil level.

*Nothing happens when the generator start button is pushed.*

- Check that the battery disconnect switch button is pushed.
- Check 12 Volt fuse on generator.
- Reset circuit breaker if necessary.
- Contact a Dutchmen dealer or qualified RV technician if problem is not resolved.

*Generator starts, but lacks electrical power.*

- Breaker switches may be off or tripped at generator. Reset breaker if necessary.
- Breaker may be off or tripped inside power center. Reset main breaker if necessary.

*Generator makes clicking sound when trying to start.*

- Battery condition may be low. Recharge if necessary.
- Check for poor ground or battery connection.

### **Interior Lights**

*Lights flicker.*

- Loose or defective bulb. Tighten or replace as needed.
- Converter is overheating. Open the cover to cool down and reduce the load by turning off some 12 Volt lights.

*Lights dim or are half bright.*

- Low battery connection. Check battery condition and recharge if necessary.
- Possible converter malfunction. Have converter checked by an authorized service center.
- Possible loss of ground. Check for loose wire connection.

### **Microwave**

*Will not operate.*

- Door open or timer OFF. Close door and turn timer ON.
- No power to oven. Check power supply and circuit breaker.

### **Monitor Panel**

*No lights on panel when switch is pressed.*

- Check battery voltage and condition.
- Check fuse at the battery; if fuse is good have a Dutchmen dealer or qualified RV technician check the condition of panel.

*Holding tank lights deliver false readings (i.e. 1/3 or 2/3 indication).*

- Verify tank is empty.
- Debris may be built up across probes. Clean and flush tank using four parts vinegar mixed to two parts water.

*Propane indicator display indicates E or F all the time.*

- Ensure propane gas tank is full.
- If display is F, check the wiring or sending unit for malfunction.
- Have it inspected by a certified technician.

### **Outside Receptacle**

*No power to outside receptacle.*

- Make sure you have power to the shoreline.
- Check breaker on generator.
- GFCI receptacle switch may be off or tripped. Reset GFCI at receptacle in bathroom or kitchen.
- Check the breaker in the power center or panel box.
- Contact a Dutchmen dealer or qualified RV technician if problem is not resolved.

### **Oven**

*Oven slow to heat up.*

*Poor baking.*

*Poor ignition of burners.*

*Pilots won't stay lit.*

*Popping sound from top burners.*

*Carbon on pilot shield.*

*Burner flame too low or too high.*

- A defective gas pressure regulator may cause these conditions. Have the regulator tested by your gas dealer or a certified RV technician.

*Top burner or oven burner won't light or won't stay lit.*

- Check position of top burners and flash tubing.
- Clean clogged burner ports with a toothpick.
- See Oven Owner's Manual for proper care and maintenance.

*Gas smell.*

- Check all connections with leak detector solution.



*Never use a match or flame to check for leaks. Failure to follow this warning could result in a fire or explosion resulting in serious injury or death.*

 **WARNING**

*All propane connections should be checked periodically as vibrations from travel may cause them to loosen. Failure to check connections could lead to a leak of propane, resulting in a fire or explosion that could cause serious injury or death.*

*Food burns on the bottom.*

- Oven too full for proper circulation. Use smaller pans or put less food in the oven.

### Propane Gas

*Smell gas in or around unit.*

- Propane tanks may be overfilled.

 **WARNING**

*Working with propane can be dangerous. Always have your dealer or certified professional perform all repairs to your LP system.*

*Follow these instructions:*

- Extinguish any open flames, pilot lights and all smoking material.
- Do not touch electrical switches.
- Shut off gas supply at the tank valve or gas supply connection.
- Open doors and other non-powered venting openings.
- Leave the area until odors clear.
- Have the gas system checked immediately and leakage source corrected by a Dutchmen dealer or qualified service center before using again.

### Refrigerator

*The control panel lights are not illuminated.*

- Check coach circuit breakers and GFCI receptacle.
- Verify that refrigerator is plugged into the 120 Volt outlet.
- If using propane gas, verify house batteries have adequate charge.

*Lights are illuminating, but no cooling.*

- Use a proper power source that is available and cooling operation to specification.
- Make sure the refrigerator unit is level.

- Allow sufficient time for proper cool down and try to load with pre-cooled food.
- Have a qualified RV technician check that the vents and chimney at the rear of the refrigerator are clear and unobstructed.
- Have a qualified RV technician make sure the burner jets or burners are not dirty or damaged.
- Have a qualified RV technician check the fuses in the black electrical box on the rear of the refrigerator.

 **WARNING**

*Extinguish all flames. Never use a match or flame to check for leaks. Failure to follow this warning could result in a fire or explosion resulting in serious injury or death.*

*Heavy frost build up on the evaporator fins.*

- Defrost the freezer and refrigerator.
- Have the refrigerator checked by a Dutchmen dealer or a qualified RV technician.

### Roof Air Conditioner

*Will not operate.*

- Make sure unit is turned on.
- Check circuit breakers in coach.
- Have a Dutchmen dealer check to see if there is proper voltage from shoreline or generator.

*Unit runs, but coil freezes and compressor cycles too soon.*

- Control setting may be too low, cycles too soon.
- Make sure the filter is clean and unobstructed.
- Have the coolant level checked by a qualified service facility.

*Does not get cold enough.*

- Start the unit before the day gets too hot.
- To offset heat gain:
  - Close all windows and blinds.
  - Keep entrance doors closed.
  - Use awnings.
  - Avoid using heat-producing appliances.
- Make sure the outside coil is not blocked or damaged.
- Have a Dutchmen dealer check to make sure you have the proper voltage.

- Should your A/C still not work after the above checks have been made, contact a qualified service facility to perform more extensive testing.

## **WARNING**

*Working with electrical appliances can be extremely dangerous. Always have your dealer or a certified professional perform all repairs to your appliance and/or RV electrical system.*

### **Running Lights**

*Running lights not working.*

- Blown fuse. Replace fuse with one of the same ampere rating.
- Bad bulbs. Replace the bulbs with new.

### **Slide-Out**

*Room move in and out very slowly, binds or squeaks.*

- Lubricate the slide-out tubes and rollers with light spray lube.

*Water is getting in at the bottom corners of the room.*

- Verify exterior seals are against the room at the top corners and not turned in when the room is out (horizontal seal overlaps vertical). Also, check for voids in the seal on the slide roof and side panels.
- Make sure weep hole in ramp pan is open and unobstructed.

*Room will not move in or out.*

- Check the auto-resetting fuse located by the slide-out motor. (See the manufacturer's manual).
- Check battery condition and state of charge. Recharge if necessary.

*Rollers leave tracks in the carpet as the room extends.*

- This is normal. There are many pounds of weight pressing these rollers down on the carpet and rollers will compress the nap of the carpet down. Raking the nap or vacuuming will solve the problem.

### **Termination Valve**

*Termination valve leaks.*

- Debris keeps valve from seating. Clear debris from and around valve O-ring set.
- Bad gasket. Have a Dutchmen dealer or qualified RV technician replace gasket with new.

### **TV Antenna**

*Poor TV reception.*

- Power jack is not turned on. Turn power jack switch to ON.
- Bad connections at TV or wall plate. Make sure the connections are good at both TV and wall plate.
- Antenna not pointed in direction of sending station. Point antenna in proper direction.
- Cut or torn cable. Have a Dutchmen dealer or qualified RV technician replace bad cable where needed at TV and antenna.

*Elevation handle turns, but antenna does not raise or lower.*

- Handle may be loose. Tighten screws.
- Gears may be stripped. Have a Dutchmen dealer or qualified RV technician replace the gears.

*Antenna will not rotate.*

- The rotate handle is engaged to the ceiling plate. Pull down on handle to disengage from the ceiling plate.
- Possible obstruction (tree branch, etc.). Remove the obstruction.
- Friction adjustment. Adjust center lock nut.
- Check to make sure roof sealant is not restricting rotation.

### **Waste Tank**

*Waste tank (black) will not drain.*

- Buildup or debris in tank. Check for buildup in tank at stool.
- Always use a minimum amount of biodegradable toilet paper.
- Always use plenty of water when flushing.
- Check termination valve for proper operation.

### **Water Heater**

*Temperature-pressure relief valve weeping.*

- Weeping or dripping of relief valve while water heater is running does NOT mean it is faulty.

*There is an odor that smells like rotten eggs.*

- If your fresh water source has a rotten egg odor, you will need to find another source of fresh water before flushing or refilling the entire RV water

storage system. To remove the hydrogen sulfide (rotten egg) odor:

- Turn off your main water supply; that is your pump or your water hookup source.
- Drain your water heater tank by removing the drain plug. Approximately two quarts of water will remain in the bottom of the tank. If you notice during the draining that the water is flowing sporadically or slowly, instead of flowing freely, you should open your relief valve to allow air into the tank.
- If the water does not flow freely, take a small gauge wire or coat hanger and push through the drain opening to eliminate any obstructions.
- After thoroughly draining the tank, flush the entire system from the water inlet all the way to the holding tank. To flush, use four parts vinegar mixed with two parts of water. If you decide to use air pressure (55 PSI max.), it may be applied either through the inlet or outlet on the rear of the tank. It may also be applied through the relief valve port. In this case, it will be necessary to first remove the relief valve. You may then insert your air pressure through the relief valve support flange. In either case, with the drain valve open, the air pressure will force the remaining water out of the tank. If air pressure is unavailable, you may flush your tank with fresh water. Fresh water should be pumped into the tank with the assistance of the on board water pump or with the assistance of external water pressure. Once again, external pressure may be pumped into the unit either through the inlet or outlet found on the rear of the water tank, or using the relief valve inlet located on the front of the unit.
- Continue this flushing process for approximately five (5) minutes allowing ample time for the fresh water to agitate the stagnant water on the bottom of the tank and force the deposits through the drain opening.
- Upon completion of the steps above, close the drain plug as well as the relief valve. Refill with fresh water, circulate and rinse.

- If you use your vehicle frequently or for long periods of time, flushing the water heater several times a year will prolong the life of the water heater storage tank.

*Water heater will not fire up.*

- Check for obstructions in burner tube and exhaust.
- Check 12 Volt power for possible blown fuse.
- Bad circuit board. See your dealer.

### **Water Pump**

*Pump will not start.*

- Check that house battery disconnect switch is on.
- Check pump switch at monitor panel.
- Check fuse in power center.
- Check to see if water is frozen.

*Will not prime, sputters. (No discharge, but the motor runs).*

- Check to see if there is water in the tank, or if air collected in the hot water heater.
- Check for frozen water lines or water tank.

*Pump will not shut off. Runs when faucet is closed.*

- Turn off the pump or city water supply.
- Check for damp areas around plumbing appliances.
- Check plumbing for leaks and inspect for leaky valves on toilet.
- Have the pump checked by a Dutchmen dealer or a qualified RV technician.

### **Water System**

*Wet areas near water connections, pump runs while the faucets are closed, and not other fresh water fixtures are being used.*

- There is a possible leak,
- Close all low point water drains and tank drains.
- Turn off all fixtures.
- Check all fixtures and connections for tightness. Do not over tighten fittings as this may cause additional leakage.

## COMPONENT MANUFACTURER WARRANTY CONTACTS

The following chart provides contact information for components that may be installed in your recreational vehicle. The information listed in this chart is the latest available at the time of publication of this manual. If you have questions or concerns regarding a component part not listed here, contact your dealer for further assistance.

Component	OEM	Website	Phone #
Air conditioner	Dometic	www.dometic.com	(800) 544-4881
Antenna - Radio	Jensen	www.asaelectronics.com	(877) 305-0445
Antenna - TV	Winegard	winegard.com	(800) 288-8094
Awnings	Carefree of Colorado	www.carefreeofcolorado.com	(800) 622-3230
Awnings	Dometic / A&E	www.dometic.com	(800) 544-4885
Axles	Lippert	www.lci1.com	(866) 524-7821
Baggage Door	Kinro	www.kinro.com	(574) 535-1125
Bunk Door	Challenger Door	challengendoor.com	(574) 773-0470
Carbon Monoxide Detector	Atwood	www.atwoodmobile.com	(800) 546-8759 USA (800) 825-4328 Canada
Carbon Monoxide Detector	Costar	www.qginc.com	(800) 432-5599
Carbon Monoxide Detector	Safe-T-Alert	www.mtiindustries.com	(800) 383-0269
Central Vacuum	Dirt Devil	www.dirtdevilcentral.com	(330) 875-5556
Central Vacuum	Eureka	www.eurekacentralvac.com	(800) 369-2326 USA (800) 282-2886 Canada
Converter	Parallax	www.parallaxpower.com	(800) 443-4859
Converter	WFCO	www.wfcoelectronics.com	(574) 294-8997 (800) 446-6180 USA
Converter	Xantrex	www.xantrex.com	(800) 670-0707 Canada
DVD Player	Coby	midwestsales.org	(800) 772-7262
DVD/CD Player	Jensen	www.asaelectronics.com	(877) 305-0446
Entrance Door	Lippert	www.lci1.com	(866) 524-7821
Entrance Door, Keyless	Challenger Door	challengendoor.com	(574) 773-0470
Fiberglass Skin	Global Composites	www.globalcompositesinc.com	(574) 522-9956
Fifth Wheel Jacks	Lippert	www.lci1.com	(866) 524-7821
Fire Extinguisher	First Alert	www.brkelectronics.com	(800) 323-9005
Fireplace	Dimplex	www.dimplex.com	(800) 668-6663
Floors	Dutchmen	dutchmen-rv.com	(574) 537-0700
Frame	BAL	www.norcoind.com/bal	(800) 347-2232
Frame	Lippert	www.lci1.com	(866) 524-7821 (800) 546-8759 USA
Furnace	Atwood	www.atwoodmobile.com	(800) 825-4328 Canada
Furnace	Suburban	www.rvcomfort.com/suburban	(423) 775-2131
Generator	Onan	www.cumminsonan.com	(800) 888-6626
Landing Gear System, Electric	Lippert	www.lci1.com	(866) 524-7821
Leveling Jacks	Lippert	www.lci1.com	(866) 524-7821
Microwave	Dometic	www.dometic.com	(800) 544-4883
Microwave	High Pointe	www.collins-n-co.com	(574) 848-1118 (800) 344-1274 USA (800) 688-2002 Canada
Microwave	Magic Chef	www.maytag.com	(574) 522-7781
Microwave	Samsung	www.riverparkinc.com	(800) 772-7262
Microwave	Sharp	midwestsales.org	(866) 698-2538
Microwave	Whirlpool	www.whirlpool.com	(800) 772-7262
Microwave, Convection	Apollo	midwestsales.org	(800) 250-7051
Monitor Panel	KIB	www.kibenterprises.com	(888) 226-9850
Outdoor Grille	Sidekick	www.flemingsalesoem.com/outdoorsunlimited	(800) 546-8759 USA (800) 825-4328 Canada
Propane Detector	Atwood	www.atwoodmobile.com	(800) 383-0269
Propane Detector	Safe-T-Alert	www.mtiindustries.com	(877) 305-0445
Radio/Stereo	Audiovox	www.asaelectronics.com	(877) 305-0447
Radio/Stereo	Jensen	www.asaelectronics.com	(877) 305-0447
Radio/Stereo	RCA	tristardistributing.com	(800) 456-3340
Range Hood	Elixir Industries	www.elixirind.com	(800) 421-1942
Range Hood	Heng's Industries	www.hengsindustries.com	(877) 295-1205 (800) 546-8759 USA (800) 825-4328 Canada (800) 344-1274 USA
Range/Oven	Atwood	www.atwoodmobile.com	(800) 688-2002 Canada (423) 775-2131
Range/Oven	Magic Chef	www.maytag.com	(866) 616-2664
Range/Oven	Suburban	www.rvcomfort.com/suburban	(800) 544-4884
Refrigerator	Amana	www.amana.com	(574) 848-1118
Refrigerator	Dometic	www.dometic.com	(877) 337-3639
Refrigerator	GE	www.collins-n-co.com	(800) 543-1219
Refrigerator	Haier	www.haieramerica.com	(800) 543-1219
Refrigerator	Norcold	www.thetford.com/home/products/norcoldrefrigerators	(574) 537-0701
Roof	Dutchmen	dutchmen-rv.com	(800) 421-1942
Roof Vent	Elixir Industries	www.elixirind.com	(800) 521-0298
Roof Vent	Fan-Tastic Vent	www.fantasticvent.com	(877) 295-1205
Roof Vent	Heng's Industries	www.hengsindustries.com	(574) 848-4491
Roof Vent	Ventline	www.ventline.com	(800) 837-2059
Rubber Roof	Dicor	www.dicor.com	

**COMPONENT MANUFACTURER WARRANTY CONTACTS**

Sidewall	Dutchmen	dutchmen-rv.com	(574) 537-0702
Slide-Out Cover	Carefree of Colorado	www.carefreeofcolorado.com	(800) 622-3231
Slide-Out System	BAL	www.norcoind.com/bal	(800) 347-2232
Slide-Out System	Lippert	www.lci1.com	(866) 524-7821
Smoke Detector	Family Gard	www.brkelectronics.com	(800) 323-9005
Stabilizer Jack System, Rear Electric	Lippert	www.lci1.com	(866) 524-7821
Stabilizer Jacks	BAL	www.norcoind.com/bal	(800) 347-2232
Stabilizer Jacks	Domar	www.domarproducts.com	(574) 295-8791
Stabilizer Jacks	Lippert	www.lci1.com	(866) 524-7821
Steps	Lippert	www.lci1.com	(866) 524-7821
Structurewood	Dutchmen	dutchmen-rv.com	(574) 537-0703
Suspension System	MOR/Ryde	www.morryde.com	(574) 293-1581
Television	Apex	tristardistributing.com	(800) 456-3340
Television	Haier	www.haieramerica.com	(877) 337-3639
Television	Jensen	www.asaelectronics.com	(877) 305-0448
Television	Samsung	www.riverparkinc.com	(574) 522-7781
Television	Sony	www.riverparkinc.com	(574) 522-7781
Television	Westinghouse	www.mitocorp.com	(800) 433-6486
Tents	Cascade Designs	cascadedesigns.com	(800) 531-9531
Tents	National Tent	www.lci1.com	(574) 533-3932
Tires	Lionshead	n/a	(574) 533-6169
Toilet	Thetford	www.thetford.com	(800) 543-1219
Tongue Jack	BAL	www.norcoind.com/bal	(800) 347-2232
Tongue Jack	Lippert	www.lci1.com	(866) 524-7821
Towing Hitch	Lippert	www.lci1.com	(866) 524-7821
TV/DVD Combo	Coby	midwestsales.org	(800) 772-7262
TV/DVD Combo	Haier	www.haieramerica.com	(877) 337-3639
TV/DVD Combo	JVC	midwestsales.org	(800) 772-7262
TV/DVD Combo	RCA	tristardistributing.com	(800) 456-3340
TV/DVD Combo	Samsung	www.riverparkinc.com	(574) 522-7781
Washer/Dryer	Splendide	www.splendide.com	(800) 356-0766 #5 (800) 546-8759 USA
Water Heater	Atwood	www.atwoodmobile.com	(800) 825-4328 Canada
Water Heater	Suburban	www.rvcomfort.com/suburban	(423) 775-2131
Water Pump	Artis Products	www.wfcoelectronics.com	(574) 294-8997
Water Pump	Flojet / ITT	www.itfflowcontrol.com	(949) 859-4945
Water Pump	SHURflo	www.shurflo.com	(800) 854-3218
Water Tank Heat Pads	Ultra-Heat	www.ultraheat.com	(574) 522-6594
Wheel Covers	Lionshead	n/a	(574) 533-6169
Wheel Inserts	Lionshead	n/a	(574) 533-6169
Windows	Kinro	www.kinro.com	(574) 535-1126

# Dutchmen

**Check applicable box(es):**

- Notice of:  CHANGE OF ADDRESS  
Notice of:  TOTALED  DESTROYED  STOLEN  
Notice of:  CHANGE OF OWNERSHIP

**ATTENTION!**

Federal record keeping laws require that we maintain a file of owners of our RV's. This form must be completed by the RV owner in case of change of address, totaled, destroyed or stolen RV, and by the RV purchaser in the case of change of ownership.

*Thank you!* Your cooperation in mailing a copy of this completed form to Dutchmen is appreciated.

**Please Print:**

Vehicle Identification Number/Serial Number \_\_\_\_\_

Owner Name \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ ST/PR \_\_\_\_\_ Zip Code/Postal Code \_\_\_\_\_

Country \_\_\_\_\_ Phone Number \_\_\_\_\_

Your Date of Purchase \_\_\_\_\_ Owner Email \_\_\_\_\_

**New Street Address** \_\_\_\_\_

**New City** \_\_\_\_\_ **ST/PR** \_\_\_\_\_ **Zip Code/Postal Code** \_\_\_\_\_

**New Country** \_\_\_\_\_ **New Phone Number** \_\_\_\_\_

**Buyer Name** \_\_\_\_\_

**Buyer Street Address** \_\_\_\_\_

**Buyer City** \_\_\_\_\_ **ST/PR** \_\_\_\_\_ **Zip Code/Postal Code** \_\_\_\_\_

**Buyer Country** \_\_\_\_\_ **Buyer Phone Number** \_\_\_\_\_

**Buyer Date of Purchase** \_\_\_\_\_ **Buyer Email** \_\_\_\_\_

**PLEASE SIGN AND DATE:**

\_\_\_\_\_  
DATE

\_\_\_\_\_  
SIGNATURE OF OWNER

\_\_\_\_\_  
SIGNATURE OF CO-OWNER

**PLEASE MAIL OR FAX YOUR COMPLETED FORM TO:**

**Dutchmen Manufacturing, Inc.**  
**Customer Service**  
**P.O. Box 2164**  
**Goshen, IN 46527**  
**Fax: (574)537-0496**



Notes

Notes



**Dutchmen wants you to enjoy a positive ownership experience. If you have a problem obtaining satisfactory and timely warranty service, please contact our Customer Service Department at 1-574-537-0700 so that we may assist you with resolving your concerns.**

For additional resource information, including downloads of various component and systems manuals and literature, please visit our website at [www.dutchmen.com](http://www.dutchmen.com) and click on the Customer Service tab.

All information contained in this manual is believed to be accurate at the time of printing; however changes may occur without notice. Please refer to the product literature provided with your unit for warranty information specific to the components contained within your recreational vehicle.

*Dutchmen Manufacturing, Inc.  
PO Box 2164  
Goshen, IN 46527  
1-574-537-0700*