

SERENOVA

BY GRAND DESIGN RV



**SERENOVA TRAVEL TRAILER
OWNER'S MANUAL**

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Welcome to the Grand Design RV family!

THANK YOU for purchasing a Grand Design recreational vehicle to enjoy the adventure, leisure, and fun of the RV lifestyle. Your new RV has been designed and built to Grand Design's highest quality and safety standards. To keep you and your family safe, our products meet or exceed all applicable state and federal regulations, standards and requirements as well as those of the *Recreational Vehicle Industry Association*.

The Grand Design RV Team and our Dealer Partners pledge to always do our absolute best to provide you with a positive ownership experience as you pursue all of the exciting opportunities this "Grand" lifestyle has to offer.

Please thoroughly read and understand the content of this Owner's Manual and the various component manufacturer manuals included with your RV, paying special attention to any safety precautions (*Dangers, Cautions, Warnings and Notices*). Before camping, learn how to properly operate and maintain all of your recreational vehicle's appliances, components, and systems. Familiarize yourself and your family with the safety features built into your RV, and the actions and steps necessary to ensure safe camping.

The Grand Design RV Warranties (*One Year Limited Towable Base Warranty, Three Year Limited Towable Structural Warranty, and Five Year Limited Towable Frame Warranty*) are printed in the *Fifth Wheel/Travel Trailer Warranty and Service Guide* found in your Owner Information Package. Please read each of them carefully to fully understand the duration and extent of your coverage as well as the various exclusions and limitations that may apply. Our component suppliers may also provide additional warranties that extend coverage beyond our warranties. Please be sure to read all component warranty information found in your Owner Information Package and submit any required registration forms. ***Failure to perform required maintenance could void your warranty. Know that some ongoing maintenance is required and must be performed at specified intervals for your warranty to remain in effect.***

All of us at Grand Design RV and your Grand Design Dealer THANK YOU again for your purchase. We wish you many safe and happy journeys in your new RV and a lifetime of fond memories.

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SERENOVA™

Travel Trailer Owner's Manual

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Introduction

About This Owner's Manual

You are responsible for the safe operation and use of your recreational vehicle (RV). This manual is designed to guide you through the normal operation, safety, care, and maintenance of your RV. The procedures outlined are typical for normal operating conditions. We include tips to help you enjoy the RV lifestyle; however, this guide is not intended to teach you how, or where, to camp.

Information in this manual is not meant to in any way supplement, modify, or alter the terms and conditions of the Grand Design RV One Year Limited Towable Base Warranty, Three Year Limited Towable Structural Warranty, and Five Year Limited Towable Frame Warranty or any of the component manufacturer warranties.

The information in this manual is accurate at the time of publication but is subject to change without notice. Due to ongoing upgrades and improvements, some photographs, drawings, components, or systems described may not represent what is actually in your RV.

Grand Design RV Customer Service Contact Information

If you have any questions, concerns, or require assistance regarding any aspect of your RV, please contact your dealer or Grand Design RV Customer Service.

Contact Information:

Website: gdrv.com
Email: customerservice@gdrv.com
Phone: (574) 825-9679
Fax: (574) 825-9249

Address: Customer Service
Grand Design RV
11356 County Road 2
Middlebury, IN 46540



Owner Information Package



This Owner's Manual, the Grand Design RV FW / TT Warranty & Service Guide, and the entire Owner Information Package must be considered a *permanent part* of the RV. If the RV is sold, all of these should remain with the RV for the next owner.



Owner Information Package

The Owner Information Package contains the manual and registration information for various individual components of your new Serenova Travel Trailer (TT).

- It is critical that you register and activate each component warranty within the prescribed time limits to avoid loss of warranty coverage.

- **Some manufacturers require online registration through their company website.**

See **page 14**, *Component Supplier Contact Information*.

- Some component manufacturers offer warranties beyond Grand Design RV's One Year Limited Towable Base, Three Year Limited Towable Structural, and Five Year Limited Towable Frame Warranties.
- Other components are warranted separately and exclusively by the individual component manufacturer, and are therefore excluded from our One Year Limited Towable Base, Three Year Limited Towable Structural, and Five Year Limited Towable Frame Warranties.
- **BEFORE using your RV, it is important that you read and understand the information in this manual and your Owner Information Package. Some component manuals are ONLY available on the manufacturer's website.**

Manufacturing Certification

We build all Grand Design RV fifth wheels and travel trailers to meet or exceed the thorough safety and manufacturing codes, standards, and regulations of the Recreational Vehicle Industry Association (RVIA).

- Both RVIA and Transport Canada conduct frequent random audits to confirm our RVs are manufactured to U.S. (RVIA) and Canadian (CSA) standards.
- The RVIA or CSA Group label found on the sidewall next to the entry door confirms that your RV has been constructed to these exacting codes and standards.
- RVs built for sale in Canada may differ to conform to Canadian codes.

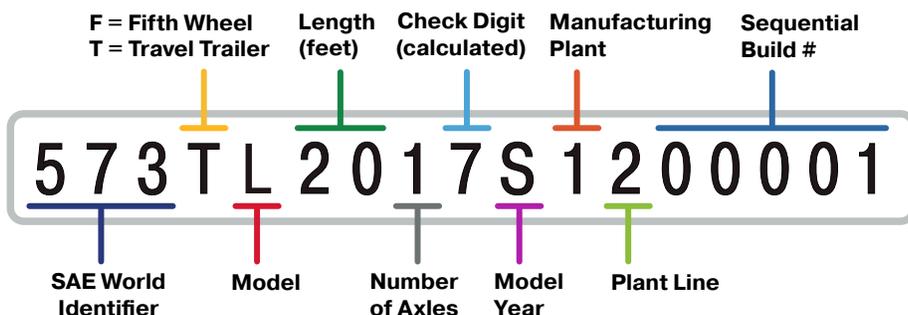


This NOTE symbol is used to identify special attention items, like useful tips, reminders or maintenance items.

Vehicle Identification Number

The unique 17-digit vehicle identification number (VIN) for your RV is stamped on a metal tag permanently attached to the trailer's A-frame. It is also listed on the Federal Certification label.

A breakdown of a typical Grand Design RV VIN is shown in the example below:



SAE World Identifier:

573 — Grand Design RV

Make / Model:

L — Serenova
 E — Imagine
 S — Solitude
 M — Momentum
 R — Reflection
 T — Transcend

Length:

The number listed falls within a predetermined, specified grouping that does not indicate the actual measured length of your RV.

Model Year:

P — 2023
 R — 2024
 S — 2025
 T — 2026
 V — 2027

 The last 8 digits of the VIN number are also the RV's serial number. For the example shown, the serial number is S1200001.



Various safety and information labels are attached to surfaces both inside and outside your RV.

These labels are permanent and should not be removed or relocated for any reason.

Safety Precautions

Nothing is more important than the personal safety of you, your family and others. Safety encompasses several areas related to the RV experience. This includes driving/towing safety, occupant safety, operational safety, environmental safety, and more. Any time you are dealing with carbon monoxide producing appliances, propane gas, electricity and other hazards it is critical that safety become your number one priority in and around your recreational vehicle.



The Safety Alert Symbol is used to alert you to potential personal injury hazards. It is imperative that you read, understand and abide by these safety alerts and messages to avoid possible personal injury or death.



DANGER

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



WARNING

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



CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

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

Additional Terminology Used

[Customer Supplied] This denotes aftermarket items not installed or included by Grand Design RV. Items noted as “customer supplied” are not covered by the Limited Towable Base, Limited Towable Structural, and Limited Towable Frame Warranties. The inclusion of items noted as “customer supplied” does not imply or suggest the availability, application sustainability, or inclusion for any specific unit.

[If so equipped] This denotes items that may be installed by Grand Design on particular RVs. Additionally, some items noted as “if so equipped” can only be included during the manufacturing phase and cannot be added at a later date. The inclusion of items noted as “if so equipped” does not imply or suggest the availability, application sustainability, or inclusion for any specific unit.

[Optional] This denotes items that may be an option on all or particular models. Additionally, some optional items can only be included during the manufacturing phase and cannot be added at a later date. The inclusion of optional items does not imply or suggest the availability, application sustainability or inclusion for any specific unit.

Reporting Safety Defects

In the United States

If you believe your vehicle has a defect, that could cause an accident, injury or death, you should immediately inform the **National Highway Traffic Safety Administration (NHTSA)**, and Grand Design RV.

If the NHTSA receives similar complaints, they may open an investigation. If they determine that a safety defect exists in other vehicles, a recall and remedy campaign may be ordered. The NHTSA does not become involved in individual cases between you, your dealer, or Grand Design RV.

To contact the **NHTSA**,

Website: nhtsa.gov

Address: NHTSA Headquarters
Attn: Administrator
1200 New Jersey Avenue, SE
Washington, DC 20590

Toll-free Vehicle
Safety Hotline: 1-888-327-4236

TTY: 1-800-424-9153

Additional motor vehicle safety information is available online at nhtsa.gov

In Canada

If you believe that your vehicle has a defect, which could cause a crash or could cause injury or death, you should immediately inform **Transport Canada's Defect Investigations & Recalls Division**, and Grand Design RV.

To contact **Transport Canada**,

Website: tc.gc.ca

Address: Transport Canada
Defect Investigations & Recalls Division
330 Sparks Street
Ottawa, ON K1A 0N5
Canada

Toll-free in Canada: 1-800-333-0510

If calling internationally,

or from the Gatineau-Ottawa area: 1-819-994-3328

Service & Warranty

Dealer's Responsibilities

When you buy your new RV, at the time of purchase, your dealer is expected to:

1. **DELIVER your RV in the best condition possible.**
Your RV must pass the dealer's Pre-Delivery Inspection (PDI). This inspection tests all systems and components.
2. PROVIDE an orientation to familiarize you with how to operate all systems and components of your new RV.
3. REVIEW with you, and explain the provisions of the *Limited Towable Base, Limited Towable Structural, and Limited Towable Frame Warranties*.
4. SEND your completed *Warranty Registration and New Vehicle PDI Check List* to Grand Design RV.
 - ***Your registration form is required within 30 days of the delivery date to activate your warranty coverage.***
5. ENSURE that you receive the complete Owner Information Package for your RV.
6. ASSIST you with all component manufacturer warranty registrations (*i.e., locating the model and serial numbers of components as needed*).
7. EXPLAIN how to obtain local and out-of-town service for your RV, and its (separately warranted) components, including repairs NOT under warranty.
8. SERVICE all Grand Design RV products.



To activate your Two Year Limited Towable Base Warranty, Three Year Limited Towable Structural Warranty and Five Year Limited Towable Frame Warranty, Grand Design RV **must** receive a completed Warranty Registration Form (*signed & dated*) from your selling dealer.

Owner's Responsibilities

As the owner, you are responsible for the regular care and maintenance of your RV in accordance with this manual and the component manufacturer's instructions.

- It is also your responsibility and obligation to return the RV to an authorized dealer for any warranty repairs and service that may be required.
- Proper maintenance will help avoid situations where the Limited Towable Base, Limited Towable Structural, and Limited Towable Frame Warranties will not cover items due to neglect.
- Your dealer is responsible for proper service prior to delivery, and has a continued interest in your satisfaction.
 - We recommend warranty and maintenance services be performed by *your* Grand Design RV dealer.
- It is important to protect yourself and others with insurance coverage for your RV. Your insurance agent can assist you in obtaining the appropriate insurance coverage for personal liability, theft, collision, property damage, etc.



Failure to contact Grand Design RV Customer Support, unauthorized or improper warranty repairs, or not returning requested original parts may result in loss of reimbursement and/or loss of warranty.

Obtaining Warranty Service

Warranty service must be obtained:

- WITHIN a reasonable time after the discovery of a defect, *and*
- BEFORE the applicable warranty period expires.

To help your dealer provide you the best level of service, please do the following:

Call ahead

Typically, before holidays and the beginning/end of the camping season are the busiest times for service departments. Before a planned trip in your RV, it is recommended to have any service you need performed well in advance. Your dealer may need several weeks to place you into their schedule.

- **ALWAYS make an appointment for service.**
- **DO NOT drop off your RV at the dealership (or repair facility) without authorization from the dealer AND an appointment.**

Be prepared

Keep your warranty and service history paperwork available. Past repairs and maintenance records may help the service technician diagnose a current issue.

Make a list

Provide the dealer a prioritized list of all repairs needed. If you need your RV returned by a specific date, discuss this with the dealer's service management. To complete lower priority list items or if parts need to be ordered, a second appointment may be required.

While waiting

Usually, customers cannot watch as repair work is performed.

- The service shop's insurance may even *require* that customers not be allowed in the service area.

Inspect the work performed

INSPECT all repairs thoroughly. NOTIFY the service shop manager of any dissatisfaction right away.

- If you cannot immediately return your RV for repair, make an appointment to return as soon as possible.
- If a problem re-occurs after leaving the dealership, contact the dealer's service manager *and* Grand Design RV Customer Support, to quickly resolve the issue.



Please have the following available when you call:

1. Your name, location and phone number where you can be reached.
2. Your RV's 17-digit VIN.
3. Date of purchase.
4. Contact information for the RV repair facility or dealer.
5. Detailed description of the concern.
6. If applicable, the component description, serial and model numbers.



Promptly report any issue with an RV repair to the management where the work was done. All repair businesses require notification of problems within a specified time limit. Please familiarize yourself with the RV dealer or repair center's policies.

Obtaining Emergency Warranty Repair

A roadside emergency can happen at any time, whether your RV is new or old. If you are traveling, using the following guidelines can help get you back on the road faster.

1. To find the nearest authorized repair center, **go to our website: gdrv.com**
 - **CLICK** on **Find a Dealer** in the red box at the top, *right corner* of the page.
2. If there is not an *authorized dealer* near your location, try the following to find a repair facility:
 - Ask the campground staff for referrals.
 - Search on the Internet.
 - Check the local telephone book/yellow pages.
 - Contact your dealer, *or*
 - Grand Design RV Customer Support.
3. **When you find an authorized dealer or repair facility:**
 - a. CALL the RV repair facility to discuss your situation and make an appointment.
 - ASK how their billing will be handled.
 - They may choose to bill Grand Design RV directly; if not, you are expected to pay them.
 - b. Have the RV repair facility inspect your RV.
 - **BEFORE any work is performed**, either the repair facility or you **must** call Grand Design RV Customer Support to discuss applicable warranty coverage.
 - c. Grand Design RV Customer Support will issue an authorization number upon warranty repair approval and advise if any original parts must be returned.
 - d. The repair center should only begin work on your RV **AFTER** the authorization number has been issued.
 - e. **FOR REIMBURSEMENT:** You or the RV repair facility **must** send a copy of your Itemized Repair Bill, **and**
 - **RETURN** all requested parts to Grand Design RV by UPS (regular ground, freight pre-paid) **within 60-days of the completed repair date.**
 - **TO EXPEDITE PROCESSING YOUR WARRANTY CLAIM:** In addition to your Itemized Repair Bill, please include your Name, Address, Phone Number, the RV's 17-digit VIN, and your Authorization Number.
 - *If returning parts*, include a copy of your freight bill.

- f. **INSPECT the completed repair work *thoroughly*.**
- *Make sure you are satisfied with the repair BEFORE you pay or leave the premises.*
 - *If you are not satisfied, immediately communicate any issues to the RV repair facility's management.*

Obtaining emergency repair assistance on a weekend or after business hours

If an authorized Grand Design RV dealer is not located nearby, contact your selling dealer for assistance. If your dealer is closed, check with the campground staff or telephone yellow pages for an RV repair facility. Have the item repaired and contact Grand Design RV Customer Support immediately the following business day.

Replacement Parts

Replacement WARRANTY parts are **ONLY** distributed through *authorized* Grand Design RV dealers and service centers.

- If an original part is no longer available, Grand Design RV or your dealer will make every effort to provide an approved substitute.
- Also see our website: www.gdrv.com
Owners Hub > Resources > Parts Lookup

Aftermarket Installations & Alterations

Aftermarket installations or alterations to your RV's original equipment as distributed by Grand Design RV are **NOT** covered by the Limited Towable Base, Limited Towable Structural, and Limited Towable Frame Warranties. The special body company, assembler, equipment installer, or up-fitter is solely responsible for warranties on the body or equipment and any alterations (or any effect of the alterations) to any of the parts, components, systems, or assemblies installed by Grand Design RV.

Grand Design RV is not responsible for the safety or quality of design features, materials, or workmanship of any alterations by such suppliers.

Updating Your Contact Information

Please help us keep your contact information up to date. We request that you please notify Grand Design RV in writing of any change in:

- **Address,**
- **Ownership, or**
- **if your RV is ever stolen or totaled.**

Please remember to contact us:

- ***if you sell your RV, or***
- ***if you are NOT the original owner, having purchased a previously owned (used) Grand Design RV.***

Federal law requires that we keep the contact information current for all Grand Design RV owners (*mailing address, phone number, and email*) in order to promptly contact you in the event of a customer notification letter or recall.

To update your contact information,

Email: registration@gdrv.com

or Write: Customer Service
Grand Design RV
11356 County Road 2
Middlebury, IN 46540

If you have any questions, please contact Grand Design RV Customer Support at (574) 825-9679.

Grand Design RV Warranties:

- One-Year Limited Towable Base Warranty
- Three-Year Limited Towable Structural Warranty
- Five-Year Limited Towable Frame Warranty

All three transferable Grand Design RV Warranties are printed in the **Grand Design RV Fifth Wheel / Travel Trailer Warranty & Service Guide**, found in your Owner Information Package. A digital copy of the Guide is available for download using the QR Code, *right*.



Pictured above, the Grand Design RV Fifth Wheel / Travel Trailer Warranty & Service Guide is found in your Owner Information Package.



To download the Grand Design RV FW/TT Warranty & Service Guide:

SCAN the QR Code, above, with the camera on your smartphone or tablet.

Component Supplier Contact Information

All component suppliers listed are correct at the time of printing. Grand Design RV may change components at their discretion. Please contact GDRV Customer Support with any questions.

Component	Brand	Supplier Website	Phone Number
Air Conditioner	Coleman-Mach	airxcel.com	(316) 832-4357
Awning(s)	Lippert / Girard	lci1.com	(574) 537-8900
Anti-Lock Braking Sys. (ABS)	Dexter Tow Assist	dexteraxle.com	(574) 295-7888
Independent Suspension	MORryde	morryde.com	(574) 293-1581
Back-Up Camera	ASA Electronics	asaelectronics.com	(877) 305-0445
Baggage Doors	Lippert	lci1.com	(574) 537-8900
Converter / Inverter	WFCO	wfcotech.com	(877) 294-8997
Entry Door	Lippert	lci1.com	(574) 537-8900
Entry Steps	Lippert	lci1.com	(574) 537-8900
Frame / Chassis	MORryde	morryde.com	(574) 293-1581
Furnace	Dometic	dometic.com	(800) 544-4881
Graphics	Vomela	vomela.com	(877) 294-8997
Load Center	WFCO	wfcotech.com	(651) 228-2200
Microwave /Convection Oven	High Pointe	collins-n-co.com	(574) 848-1118
Power Tongue Jack	BAL RV Products Group	norcoind.com	(574) 557-7788
Range Hood	Furrion	furrion.com	(888) 354-5792
Range Top	Furrion	furrion.com	(888) 354-5792
Refrigerator - 12V	Furrion	furrion.com	(888) 354-5792
Roof Membrane	Alpha Systems	alphallc.us	(800) 462-4698
Slideout	Lippert	lci1.com	(574) 537-8900
Solar Charging System	GoPower!	dometic.com	(800) 544-4881
Stereo (Bluetooth)	ASA	asaelectronics.com	(877) 845-8750
Premium Speaker	Klipsch	asaelectronics.com	(877) 845-8750
Television	Jenson 12V	asaelectronics.com	(877) 845-8750
Thermostat	Coleman-Mach	airxcel.com	(316) 832-4357
Tires	Goodyear	lionsheadtireandwheel.com	(574) 533-6169
Toilet	Thetford	thetford.com	(800) 543-1219
TV Antenna	Winegard Company	winegard.com	(800) 288-8094
Water Heater	Furrion	furrion.com	(888) 354-5792
Water Pump	Seaflor	rangerdistribution.com	(574) 891-4994
Windows	Lippert	lci1.com	(574) 537-8900

Component Manufacturer Warranty Information

Each OEM component equipped on your Serenova TT carries their own manufacturer warranty. Details can be found on the individual company websites or by contacting them by phone. Warranty information is accurate at time of printing but is subject to change at any time per the manufacturer. See **previous page**, *Component Supplier Contact Information*.

Component	Brand	Manufacturer Warranty
Air Conditioner	Coleman-Mach	Two year limited warranty from date of purchase.
Awning(s)	Lippert / Girard	One year limited warranty from date of purchase.
Anti-Lock Braking Sys. (ABS)	Dexter Tow Assist	Two year limited warranty from date of purchase.
Independent Suspension	MORryde	Five year limited warranty from date of purchase.
Back-Up Camera	ASA Electronics	One year limited warranty from date of purchase.
Baggage Doors	Lippert	One year limited warranty from date of purchase.
Converter / Inverter	WFCO	Two year limited warranty from date of purchase.
Entry Door	Lippert	One year limited warranty from date of purchase.
Entry Steps	Lippert	One year limited warranty from date of purchase.
Frame / Chassis	MORryde	One year limited warranty from date of purchase.
Furnace	Dometic	Two year limited warranty from date of purchase.
Graphics	Vomela	Five year limited warranty from date of purchase.
Load Center	WFCO	Two year limited warranty from date of purchase.
Microwave / Convection Oven	High Pointe	One year limited warranty from date of purchase.
Range Hood	Furrion	One year limited warranty from date of purchase.
Power Tongue Jack	BAL RV Products Group	One year limited warranty from date of purchase.
Range Hood	Furrion	One year limited warranty from date of purchase.
Range Top	Furrion	One year limited warranty from date of purchase.
Refrigerator - 12V	Furrion	One year limited warranty from date of purchase.
Roof Membrane	Alpha Systems	Limited lifetime warranty from date of purchase.
Slideout	Lippert	One year limited warranty from date of purchase.
Solar Charging System	GoPower!	Five year limited warranty from date of purchase.
Stereo (Bluetooth)	ASA	One year limited warranty from date of purchase.
Premium Speaker	Klipsch	One year limited warranty from date of purchase.
Television	Jenson 12V	Two year limited warranty from date of purchase.
Thermostat	Coleman-Mach	Two year limited warranty from date of purchase.
Tires	Goodyear	No fault 12-month limited warranty from the date of purchase. Five year limited warranty from the tire manufacture date.
Toilet	Thetford	One year limited warranty from date of purchase.
TV Antenna	Winegard Company	Two year limited warranty, Parts. One year limited warranty, Labor.
Water Heater	Furrion	One year limited warranty from date of purchase.
Water Pump	Seaflor	One year limited warranty from date of purchase.
Windows	Lippert	One year limited warranty from date of purchase.

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Occupant Safety

Your Serenova Travel Trailer is designed with safety as the top priority. This RV meets or exceeds the safety standards and applicable codes in effect at the time it is built. All required safety items are carefully installed to protect you and the occupants of your RV.

Family Safety Plan

Develop a *Family Safety Plan* to use in case of an emergency or severe weather condition. Practice it with your entire family, especially children.

- Before camping, please review and understand the locations of all doors, emergency exit windows, and safety equipment inside your RV.
- Teach everyone what the RV safety alarm signals mean and how to be prepared to leave the RV, by themselves if necessary.
- Draw a floor plan of your RV and find two ways to exit. There should be at least one way to get out of your RV without opening the door.
- Teach everyone how to *check doors* (and *not* to open them if they are **hot**). Also teach everyone to *stay low* to try to avoid breathing smoke, fumes or gases.
- Decide on a meeting place a safe distance from your RV. Make sure everyone understands to gather and wait there, in case family members are separated from one another in an emergency.
- Make sure everyone knows where to go to call the fire department or 911 from outside the RV.
- Conduct safety drills at least every six months.
 - Make sure everyone, guests included, knows how to evacuate the RV safely.
- Practice exiting the RV blindfolded; in a real fire situation, thick black smoke can make it impossible to see.
- Ask an out-of-state relative or friend to serve as your *family contact*. Make sure everyone knows the contact person's name, address, phone number and email.

For additional safety precautions, consult your local fire dept.

WARNING

During severe weather conditions, move indoors to a place of safety or shelter as directed by campground or other appropriate authorities.

- AVOID trees or power lines that could fall on your vehicle.
- The safest place during severe weather conditions is inside a basement or storm shelter, not an RV or tow vehicle.

WARNING

Be aware of the **Heat Index** if camping during hot weather.

Keep **HYDRATED**, and try to stay indoors in an **AIR CONDITIONED** area during a high Heat Index Warning.

Pet Safety

Emergency shelters could refuse to admit pets due to health or space reasons. The survival of a beloved pet often depends on the careful plans their owner has made in advance.

- Prepare an emergency plan for pets that includes a **3-day supply** (*at least*) of dry food and fresh water.

Emergency Weather Planning

Severe weather is one of the more serious conditions to take into account when camping. Weather can change with little or even no warning. Thunderstorms, hail, flooding, hurricanes, tornadoes, earthquakes, etc. can threaten your safety and damage your tow vehicle or RV.

Local radio and TV stations normally broadcast weather conditions and warnings as they occur. Research other methods of learning about severe weather conditions and how to deal with them. You may want to consider investing in a weather radio. Weather radios offer 24 hour-a-day VHF broadcasts of weather observations and forecasts directly from the US National Weather Service (NWS).

The US National Oceanic and Atmospheric Administration (NOAA) weather radio stations use frequencies 162.400, 162.425, 162.450, 162.475, 162.500, 162.525, & 162.550 megahertz, or visit their website noaa.gov

Repairing severe weather damage

If your RV (or tow vehicle) is damaged due to severe weather, BEFORE scheduling any repair work:

- **CALL your insurance company to report your claim as soon as possible.**



Please familiarize yourself with the following weather terms:

Warning - indicates that a particular weather hazard is either imminent or has been reported.

Move to a safe location immediately. Take action to protect life and property. The type of hazard is named in the type of warning (tornado warning, blizzard warning, etc.).

Watch - indicates that a particular weather hazard is possible and that conditions are favorable for its occurrence.

A watch is a time for preparation, planning, and increased awareness. Stay alert for changing weather, listen for further information and think about what to do if the danger materializes.

Fire Safety

Please **AVOID** the three (3) most common Fire Safety issues:

1. **Using Flammable Solvents/Cleaning Fluids**
 2. **Leaving Children Unattended**
 3. **Smoking In Bed**
- **In a fire emergency, EVACUATE the RV first, then call 911 from a safe location.**

- **In a fire emergency**, execute your *Family Safety Plan*.
- Make sure everyone knows to **Stop, Drop & Roll** if their clothes catch fire.
 - **Stop** in place, do not run.
 - **Drop** to the ground.
 - **Roll** back and forth, with hands shielding face from the fire.
- Supervise children around any open flame, especially grills, and campfires.
- Learn and teach safe fire practices. Build campfires away from nearby trees or bushes.
- Maintain at least a three-foot (3') CLEAR AREA around grills, campfires and tents, *that is free of pine needles, dry grass, leaves, etc.*
- ALWAYS have a way to quickly and completely extinguish a campfire ready *in advance*. NEVER leave a fire burning unattended, even a cigarette.
- Teach family members how to use the fire extinguisher and replace it as recommended.
- DO NOT store combustible materials in closed areas or near a heat source.
- DO NOT use water to put out a grease fire. Water can spread some types of fire and create an electrocution hazard during an electrical fire.
- ALWAYS call the Fire Department, No matter how small the fire.

More information on firefighting can be found at the National Fire Protection Association website: nfpa.org



NOTIFY Grand Design RV Immediately

if you feel that product failure resulted in a fire.

Call GDRV Customer Service at **(574)825-8000** for approval BEFORE the RV is entered, moved or repaired, or any debris is cleaned/removed.

Failure to notify GDRV could result in the loss of coverage.

CAUTION

AVOID inhaling the dry chemical agent in the fire extinguisher. It is not toxic but may cause skin irritation.

In case of contact:
 FLUSH the affected area with clean, cool water. If irritation persists, contact a physician immediately.



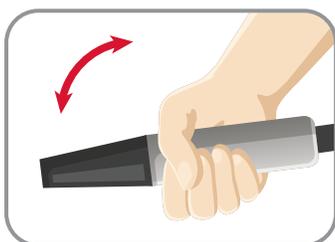
PULL the pin



AIM the nozzle



SQUEEZE the lever



SWEEP from side-to-side

Fire Extinguisher

A fire can spread very fast. BEFORE using the fire extinguisher, remember that **safe escape** is the most important part of any fire response plan. **If there is a fire in or around your RV:**

- **EVACUATING all occupants from the RV safely, must be your number one (#1) priority.**

A dry chemical, Class B/Class C type fire extinguisher is located near the entry door of your RV. The portable fire extinguisher can be used to put out small fires or contain one until the fire department arrives. Portable extinguishers do have limitations.

Household fire extinguishers are classified into four types by Underwriters Laboratories (UL):

Rating	Intended Use
Type A	For use on fires involving combustible materials such as wood, cloth and paper.
Type B	For use on flammable liquid fires, including kitchen grease. <i>NEVER use water on this type of fire.</i>
Type C	For use on fires involving energized electrical equipment.
Type ABC	Works on all three types of fires listed above.

Operation

When you use the fire extinguisher:

1. **ALWAYS keep your back to a clear exit for easy escape.**
2. **LEAVE immediately if the fire cannot be controlled or the room fills with smoke.**

There are different types and sizes of fire extinguishers, but for the most part, they all work the same.

To operate a fire extinguisher, remember the word: P.A.S.S.

PULL the pin. Hold the extinguisher with the nozzle pointing away from you, and release the locking mechanism.

AIM low. Point the extinguisher at the base of the fire.

SQUEEZE the lever slowly and evenly.

SWEEP the nozzle from side-to-side until the fire is out.

Disposal

Please check the local laws BEFORE disposing of your used (non-refillable) dry chemical fire extinguisher. Contact your local fire, sanitation or environmental protection department for rules on disposal.

Emergency Egress Window

The *Emergency Egress Window (or exit window)* is your secondary exit, if the RV's entrance door becomes blocked or unavailable. All egress windows are marked with an "**EXIT**" label (*right*) and have **RED** handles or levers. Depending upon the window type, an egress window may be a large section or an entire window. Learn and practice how to open and operate the egress window before an emergency occurs:

- When pulling into your campsite, make sure the egress windows are not blocked by trees or other obstacles.
- Also check that below each egress window the ground is solid and the escape path is clear.
- Review the egress window locations and how to operate them with all people staying in the RV.
- Plan escape routes from the front and rear of the RV.
- 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 RV should be prepared to assist those in front.
- Arrange for a meeting place safely away from the RV.

Maintenance

- To prevent the seals from sticking, OPEN and CLOSE your *Emergency Egress Window(s)* each trip.
- During transit the *Egress Window(s)* **must** be locked.





Smoke Alarm

! WARNING

Test Smoke Alarm operation after the RV has been in storage, before each trip and at least once per week during use.

! WARNING

NEVER use an open flame from a match or lighter to test the smoke alarm; you may accidentally ignite and set fire to the smoke alarm and your RV.

If the Smoke Alarm does NOT test properly, REPLACE it immediately.



DURING TESTING:

You will hear a loud, repeating horn pattern and the red LED will flash rapidly on the smoke alarm.

Smoke Alarm

The smoke alarm is located on the ceiling in the main living area of your RV. It is intended to help reduce injury or loss of life in a fire. Proper use can give you time to escape, but they are not foolproof. Smoke alarms will only sound when smoke reaches them.

- Smoke alarms **MUST** be properly located, installed, and maintained.
- **Individuals with hearing loss or certain medical problems should consider using warning devices that provide both audible and visual signals.**

Operation

- Check that a 9-volt battery is correctly connected.
- When the battery is supplying power, the red LED will flash.
- *If smoke is detected by the sensor, a loud alarm will sound until the air is cleared.*

If the smoke alarm sounds

During an alarm, you will hear a loud, repeating horn pattern and the red LED will flash rapidly.

- The alarm warns you of a potentially dangerous situation that **requires your immediate attention.**
- **NEVER ignore any alarm.** Ignoring the alarm may result in injury or death.
- EVACUATE the RV first, *then*
- Call 911 from a safe location.

How to test

TEST the smoke alarm at least once EVERY WEEK to make sure that it is working properly. Stand at arm's length from the alarm when testing. **The alarm horn is loud and may be harmful to your hearing.**

1. PRESS and HOLD the *TEST/SILENCE* button on the smoke alarm cover until the alarm sounds. The alarm may continue for a few seconds after you release the button.
2. If the alarm does not sound, check that it is receiving power, *then* TEST it again.
3. CHECK that the Smoke Alarm is clean and dust-free.
4. REPLACE the smoke alarm immediately *if it does NOT alarm or test properly.*

Battery

The smoke alarm will NOT function **if the battery is:**

- Missing, Disconnected, or Dead.
- Installed incorrectly.
- The wrong type.

REPLACE the 9-volt battery in your Smoke Alarm when it *chirps* (*the low battery warning*). NEVER disconnect the battery to silence the smoke alarm.

- **When the *low battery warning* sounds, the battery MUST be replaced to continue your protection.**

Maintenance

- **DO NOT clean with water, solvents, cleaning agents, bleach, or polish as these may damage the alarm.**
- VACUUM the Smoke Alarm cover *at least* once a month.
- DO NOT paint over the unit. Paint may clog the openings to the sensing chambers and prevent it from operating properly.

Carbon Monoxide (CO)

Carbon monoxide (CO) is an insidious poison. It is a colorless, odorless and tasteless gas. It can endanger lives even at low levels of concentration. Many cases of reported carbon monoxide poisoning indicate while victims are aware they are not well, they become so disoriented they are unable to save themselves by either exiting or calling for assistance. Young children and household pets may be the first affected.

CO gas is produced when any type of fuel is incompletely burned. Potential sources of CO in and around your RV can include gas or diesel engine exhaust, portable space heaters, gas stoves and ovens, furnaces, defective engine exhaust systems, portable grills, other nearby RVs, portable generators, generator exhaust, and other propane-powered appliances.

CARBON MONOXIDE (CO) POISONING may cause the following symptoms:

It is important to discuss these symptoms with ALL household members and RV guests.

- **Mild exposure:** Headaches, running nose, sore or watery eyes, often described as *flu-like* symptoms.
- **Medium exposure:** Dizziness, drowsiness, vomiting.
- **Extreme exposure:** Unconsciousness, brain damage and death.

WARNING

The Smoke Alarm does NOT operate without working batteries.

Removing the batteries, or failure to replace them at the end of their service life, removes your protection.

WARNING

Many cases of reported CARBON MONOXIDE POISONING indicate that while victims are aware they are not well, they become so disoriented they are unable to save themselves by either exiting the building or calling for assistance.

WARNING

If you are in an RV with either a nearby tow vehicle engine or generator running there is a potential for exhaust fumes to filter back into the RV.

The best protection against Carbon Monoxide entry into the RV is a properly maintained ventilation system and an active Carbon Monoxide (CO) Detector/Alarm.

To allow for proper operation of the ventilation system, keep the ventilation inlet grills clear of snow, leaves or other obstructions.



Carbon Monoxide (CO) Alarm

! WARNING

DO NOT stand close to the Alarm when the horn is sounding.

Exposure at close range may be harmful to your hearing. When testing, STEP AWAY when horn starts sounding.

! WARNING

Actuation of your CO Alarm indicates the presence of carbon monoxide (CO) which can KILL YOU.

This CO Alarm will ONLY indicate the presence of carbon monoxide gas at the sensor. Carbon monoxide gas may be present in other areas.

! WARNING

This CO Alarm does NOT operate without working batteries.

Removing the batteries, or failure to replace them at the end of their service life, removes your protection.

Carbon Monoxide (CO) Alarm

The CO alarm will sound if Carbon Monoxide (CO) in the air inside your RV reaches dangerous levels. If you hear this alarm, evacuate the RV immediately and stay outside in *fresh air* until the CO alarm ceases. It is important that you read and understand the OEM User's Manual found in the *Owner Information Package*.

- **The CO alarm is designed to be loud enough to wake up a sleeping person in an emergency.**

Prolonged exposure to the CO alarm at close distance may be harmful to your hearing. Individuals with hearing loss or certain medical problems, should consider using warning devices that provide both audible and visual signals.

If the CO alarm sounds, follow these instructions:

1. **MOVE TO FRESH AIR IMMEDIATELY, either outdoors or by an open door or window.**
 - CHECK that all persons are accounted for.
 - CALL 911, your local emergency service, or fire department.
 - DO NOT re-enter the premises or move away from the open door/window until the emergency responders arrive, the premises have been aired out, *and* your alarm remains in its normal operation.
2. **If your CO alarm re-activates within a 24-hour period:**
 - REPEAT the process in **Step 1**.
 - CALL a certified appliance technician to inspect that all fuel burning appliances are operating properly, and to investigate for sources of carbon monoxide.
 - IF PROBLEMS ARE IDENTIFIED during this inspection, have the equipment SERVICED IMMEDIATELY.
3. **NOTE any combustion equipment NOT inspected by the technician.**
 - For more information about CO safety and this equipment, consult the manufacturers' instructions, or contact the manufacturer directly.
4. **CONFIRM that exhaust from a nearby vehicle or generator engine is NOT the source of CO inside your RV.**

A CO alarm is NOT A SUBSTITUTE for other combustible gas, fire, or smoke alarms.

Test the CO alarm weekly

TEST the CO alarm at least once EVERYWEEK to make sure that it is working properly. Stand at arm's length from the alarm when testing. **The alarm horn is loud and may be harmful to your hearing.**

PUSH and HOLD the *TEST/SILENCE* button on the cover until the red LED flashes. The alarm horn will sound *4 beeps-pause, 4 beeps-pause*. The alarm sequence should last 5-6 seconds.

If the alarm does not test properly:

1. CHECK that the battery is installed correctly.
2. INSTALL a new 9V battery & RE-TEST the CO Alarm.
3. CHECK that the CO Alarm is clean and dust-free.
4. If it still does not alarm, REPLACE the CO Alarm immediately.

Battery

REPLACE the battery in your CO alarm when it “chirps” about once per minute (*the low battery warning*). NEVER disconnect the battery to silence the CO alarm.

- **When the *low battery warning* sounds, the battery MUST be replaced to continue your protection.**

Maintenance

To keep the CO Alarm in good working order:

- **DO NOT clean with water, solvents, cleaning agents, bleach, or polish as these may damage the alarm.**
- VACUUM the CO Alarm cover once a month, *then* RE-TEST.
- DO NOT paint over the unit. Paint may clog the openings to the sensing chambers and prevent it from operating properly.

Propane Gas (LP) Alarm

A propane leak detection device is installed for your safety, because your new RV contains a *propane gas system* and *propane appliances*. Propane gas is heavier than air. During a leak, propane flows toward and collects in low areas. For this reason, the propane alarm is located near the floor of the RV. When the LED on the front glows green, the alarm is active.

- **Individuals with hearing loss or certain medical problems should consider using warning devices that provide both audible and visual signals.**

The sensor may also detect other combustible fumes or vapors including; acetone, alcohol, butane and gasoline. These chemicals can be found in common items such as deodorant, cologne, perfume, wine, liquor, adhesive, lacquer, kerosene, most cleaning agents and the propellants of aerosol cans.

WARNING

TEST Carbon Monoxide Alarm operation: after the RV has been in storage, before each trip, and once a week while in use.

- If the CO Alarm ever fails to test correctly, have it replaced immediately!
- If the CO Alarm is NOT working properly, it *cannot* alert you to a problem.
- Failure to test units used in RV's as described may remove your protection.

The Test/Silence button is the only proper way to test the CO Alarm.

NEVER test the CO alarm with vehicle exhaust! Exhaust may cause permanent damage and voids your warranty.

WARNING

DO NOT try fixing the Alarm yourself, this will void your warranty!

If the CO Alarm is NOT operating properly, and it is still under warranty, please see “How to Obtain Warranty Service” in the Service and Warranty Section. Install a new CO Alarm immediately.

WARNING

DO NOT use spray cleaning chemicals or insect sprays directly on or near the CO Alarm.

DO NOT paint over the CO Alarm. Doing so may cause permanent damage.



Propane Gas Alarm

! WARNING

- Activation of this device indicates the presence of LP gas, which can cause an explosion and/or fire. This normally indicates a leak in the LP gas piping or an LP gas appliance.
- If the information in the manufacturer manual is not followed exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.

! WARNING

- When the alarm is first turned on, it cannot detect propane or sound a warning for two minutes.
- The propane leak alarm is not a smoke or fire alarm.
- The alarm will only indicate the presence of propane gas at the sensor.
- Explosive gas may be present in other areas.

Propane Gas (LP) Alarm, Continued

- Register your SAFE-T-ALERT product online at: mtiindustries.com/product-registration/

High temperatures can activate glue and adhesive vapors. If your RV is closed on a hot day, the chemicals used in its construction may be detected, even months after the vehicle was built.

See **page 27-30: Indoor Air Quality, Chemical Sensitivity & Outgassing, and Formaldehyde.**

Procedures to Take During an LP Gas Alarm:

1. **EXTINGUISH all flames and smoking material, & TURN OFF all gas appliances.**
(Stove, Heater, Furnace, etc.)
 - DO NOT touch any electrical switch, or use phones / electronic devices in the RV.
2. **PRESS the Test/Mute button to temporarily silence the alarm.**
 - DO NOT disconnect power.
3. **EVACUATE everyone from the RV.**
 - EXECUTE your Family Safety Plan.
4. **LEAVE the door(s) and windows OPEN.**
5. **SHUT OFF the gas supply at the LP tank valve.**
 - DO NOT start any vehicle engine or generator.
6. **DETERMINE & REPAIR the source of the leak.**
7. **DO NOT RE-ENTER THE RV UNTIL THE PROBLEM IS CORRECTED.**

Contact your dealer or propane gas service to have the problem corrected BEFORE using the propane system.

Testing the propane gas alarm

The propane alarm should be tested after each storage period, before each trip, and at least once per week while camping.

- Test the propane alarm at least once per week.
 1. Press *TEST* button until alarm sounds; then release.
 2. The detector will sound twice.
 3. The LED will turn **red**, then after 8 seconds, turn **green** again, indicating normal operation.

REPLACE propane alarm immediately if it does NOT test properly.

Battery or converter power source

The propane gas alarm runs on a small amount of 12-volt DC from the converter or auxiliary battery. This slight current draw can still drain your auxiliary battery during an extended storage period. The Low Voltage Warning will sound if the charge drops below 8 volts. **At lower voltage the alarm will no longer detect gas or provide protection against dangerous levels of LP.**

Indoor Air Quality

To maintain indoor air quality:

- **Allow your RV proper ventilation.**
- **Keep the interior clean.**
- **Avoid harmful air pollutants.**

Common air pollution sources include molds, pollen, pet dander, cigarette smoke, household cleaners and carbon monoxide from burning propane, charcoal or other fuels.

- **Proper Ventilation** carries air pollutants outside your RV, and dilutes emissions from indoor sources with fresh air from the outdoors.
- **Poor Ventilation** may increase pollutant levels inside your RV. High temperature and humidity levels can also increase the concentration of some indoor air pollutants.
- **Those most at risk for REACTIONS to poor air quality include: Children, The Elderly, and Persons with Asthma, Allergies, Heart Disease, or Chronic Lung Diseases such as Bronchitis and Emphysema.**

To improve your air quality:

- BREATHE **fresh air** by opening windows.
- Spend as much time as you can OUTSIDE in **fresh air**.
- **CONTROL MOLD:**
 - CLEAN the bathroom and kitchen often.
 - FIX any water leaks.
 - CLOSE windows and RUN your air conditioner (AC) and/or your dehumidifier.
 - CLEAN any mold you see or smell with a solution of *One Cup* of BLEACH or less, to *One Gallon* of WATER.
 - NEVER mix bleach with ammonia.

Indoor Air Quality, Continued

- CLEAN & VACUUM often to get rid of dust and pet fur which can irritate your nose and throat.
- DO NOT use bug spray inside your trailer.
- DO NOT smoke inside your RV. In addition to causing damage to your RV, tobacco smoke releases formaldehyde and other air pollutants.

EPA recommendations

The Environmental Protection Agency (EPA) recommends three (3) basic strategies to improve indoor air quality:

1. **Remove sources.** Eliminating the sources of pollution or reducing their emissions are the most effective ways to improve indoor air quality. This strategy can have an impact on the following pollutants:
 - Biological Contaminants such as bacteria, molds, mildew, viruses, animal dander, and pollen.
 - Household Products such as paints, varnishes, cleaning and disinfecting solutions, cosmetics and hobby products.
 - Pesticides.
2. **Ventilation.** Increasing the amount of outside fresh air coming inside helps to lower the concentration of indoor pollutants. Allow fresh air to circulate your RV often. OPEN the windows, doors, and exhaust vents. Operating fans, vent fans, and the roof air conditioner(s) or furnace also helps to bring in *fresh air* and force out *stale air*.
 - Keeping your RV closed, decreases the air flow, which increases the presence of indoor air pollutants.
 - Many recommendations in this manual can assist you in avoiding exposure to air pollutants & outgassed chemicals.
3. **Air Cleaners.** Air cleaners are designed to remove particles from the air. Their effectiveness depends on how well they collect pollutants from indoor air, and how much air is drawn through the cleaning/filtering element. An effective air cleaner requires both an efficient collector and a high air-circulation rate.

See the **Next Page**, *Chemical Sensitivity & Outgassing*.
See **page 31**, *Tips to controlling condensation*.

There are many sizes and types of air cleaners on the market. Most of the less expensive, table-top models, are much less effective at particle removal. Generally, air cleaners DO NOT remove gaseous pollutants.



Chemical outgassing is NOT a defect in your RV.

It is NOT covered by the Limited Towable Base, Limited Towable Structural, or Limited Towable Frame Warranties.

Please follow the recommendations in this section to address the concern.

Chemical Sensitivity & Outgassing

When you first purchase your new RV, or after it has been closed for an extended time, you may notice a chemical odor due to outgassing. This is normal, and not a defect.

Outgassing (or *offgassing*) is the release of a chemical gas that was dissolved, trapped, frozen or absorbed in a material. The amounts released through outgassing decrease over time.

Just like in your home, RV construction uses many products such as carpet, linoleum, plywood, insulation, upholstery, etc. These new products may outgas different chemicals, including formaldehyde. This can continue over time, and in particular, when exposed to elevated temperatures or humidity.

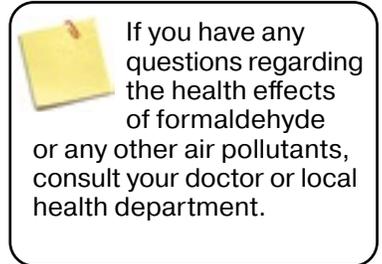
- Because an RV has much less interior space than a house, there is considerably less exchange of air inside an RV.
- This minimal air exchange can make any outgassed chemicals more noticeable.

Chemical sensitivity may cause you to experience irritation of the eyes, nose, and throat and sometimes nausea, headache, and a variety of asthma-like symptoms. Elderly persons, young children, or anyone with a history of asthma, allergies or lung problems, may be more susceptible to the effects of outgassing.

Formaldehyde

Most of the attention regarding chemical outgassing surrounds formaldehyde. Some people are very sensitive to formaldehyde exposure while others may have no reaction.

Formaldehyde is a naturally occurring substance. It is a key industrial chemical used in the manufacture of numerous consumer goods including products used in RV construction. Trace levels of formaldehyde are also released from smoking, cooking, and the use of many other household products like detergents, cleaners, paints, coatings and cosmetics.



Formaldehyde, Continued

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, Grand Design RV recreation vehicles contain composite wood products (hardwood plywood, particle board, and MDF) that comply with the California Air Resource Board (CARB) formaldehyde emission standards under California Code of Regulations § 93120.2(a) Phase 2 (P2).

Effects Of Prolonged Occupancy

- **If you plan to occupy your RV for an extended period, be prepared to deal with condensation and the humid conditions that may be encountered.**

Your RV is designed primarily for recreational and extended stay use. Modern RVs have a relatively small volume due to their compact construction. The normal living activities of even a few occupants in the RV, can lead to rapid moisture saturation of the air inside and the appearance of visible moisture, especially in cold weather.

Condensation

Condensation refers to the water droplets that appear on cold surfaces when the water vapor in the air cools, and changes to liquid water. In cold weather, it may be seen as frost or ice.

- *Moisture can condense on the inside of an RV during cold weather the same way that moisture collects on the outside of a cold glass during humid weather.*

Condensation may also collect out of sight within the walls or ceiling, causing warped or stained panels. Appearance of these conditions may indicate a serious condensation problem. To minimize condensation inside your RV, moisture in the air must be carried outside by ventilation, or removed with a dehumidifier (customer supplied).

Tips for controlling condensation

To reduce moisture in the air inside your RV, use these tips:

- 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, roof vent opened and turn on the exhaust fan (if equipped) while bathing or showering and for some time after you have finished.
- When cooking, always operate the range hood fan. Cooking releases heat and moisture that can quickly result in condensation in your RV; operating the range hood fan can be effective in removing both.
- DO NOT hang wet clothes in the RV to dry.
- Use a fan to keep air circulating inside the vehicle so condensation and mildew cannot form in dead air spaces.
- Allow air to circulate, keeping the temperature the same throughout the RV, even inside the cabinets.
 - Closed cabinets full of stored goods prevent air circulation and can cause condensation.
 - Leave closet and cabinet doors partially open.

In hot weather

- Start the air conditioner early in the day to remove excess humidity from the air while lowering the temperature.

In cold weather

- During cold weather it is very important to continue utilizing your vents and vent fans. This will keep the humid air inside moving to the outside. Keeping the RV tightly closed during cold weather will increase condensation.
- Manage the inside temperature during cold weather. The warmer temperatures inside your RV will cause condensation to form on areas that are not well insulated (i.e., windows, vents, wall studs, etc.).



If the tips presented here for controlling condensation are NOT effective, 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 can live in virtually any indoor or outdoor environment. Mold growth requires a source of moisture (*high humidity, wet/damp materials, standing water*) and a temperature between 40° and 100° Fahrenheit.

According to the Center for Disease Control, exposure to damp and moldy environments may cause a variety of health defects, or none at all.

- For people *sensitive* to molds, mold exposure may cause nasal congestion, coughing, wheezing, and/or irritation of the eyes, throat, or skin.
- People with *mold allergies* may have more severe reactions to mold exposure. Immune-compromised people and those with chronic lung illnesses, like obstructive lung disease, risk serious lung infections.

Mold growth can be very harmful to the natural wood products and fabrics in your RV. **Follow these tips to help control the relative humidity inside your RV and inhibit mold and mildew:**

- While cooking and bathing, ALWAYS use the kitchen and bathroom vents, even during colder weather.
- In addition, opening a window will increase ventilation during these activities.
- Running your air conditioner will also reduce the relative humidity.
- In extremely humid conditions, using a dehumidifier (customer supplied) can be helpful.

Mold Prevention

To help protect your RV from mold, follow these important preventative measures:

- Clean regularly, especially the kitchen and bathroom. On safe surfaces, use cleaning products that kill mold and mildew.
- Any spills should be wiped up and dried right away.
- DO NOT leave any damp items inside the RV.
- Check sealants regularly. Reseal as needed to avoid water leaks.

Cold Weather Use

Please keep in mind, that your RV is not designed for use during sub-freezing weather. If you plan to use your RV in freezing (or below freezing) temperatures, the following precautions **MUST** be taken:

- The **Water Heater, Plumbing Systems** and **drainage** require added protection to avoid freezing.
- More frequent furnace operation substantially increases battery draw and propane use.
 - Sufficient power and propane are required to protect against possible freeze-ups of the propane regulator.
- Proper ventilation or the addition of a dehumidifier may be required to reduce condensation.
- To avoid damage to parts, **CHECK** the outside of the RV for ice **BEFORE** operating the: slideouts, compartment doors, locks, windows, vents etc.

If you have further questions, please contact your dealer or Grand Design RV Customer Service.

Websites Of Interest

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

- [epa.gov/indoor-air-quality-iaq/inside-story-guide-indoor-air-quality](https://www.epa.gov/indoor-air-quality-iaq/inside-story-guide-indoor-air-quality)
- [epa.gov/mold](https://www.epa.gov/mold)
- [atsdr.cdc.gov](https://www.atsdr.cdc.gov)

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Pre-Travel Information

To help ensure your traveling enjoyment, update your GPS (customer supplied) and confirm that your route is planned with current road maps. Call ahead for tourist information for the areas that you will be visiting or traveling through. Research that your planned camping adventures comply with all federal, state and local regulations.

- Arrange for someone to check your house periodically while you are away. Stop mail or newspaper delivery.
- If you intend to be away for more than two weeks, you may want to consider requesting police surveillance for your house.
- Carry an extra set of vehicle and house keys with you on a separate key ring.
- Check that your driver's license is valid. Be sure to renew your license in advance if it will expire during your trip.
- If you are planning to visit other countries, contact the consulate nearest the point at which you plan to enter that country for the specific and most current information (including rules for re-entering the United States).

Always carry your vehicle registration, insurance policy card(s) and warranty registration.

Tow Vehicle Disclaimer

- **As a *minimum* requirement, your tow vehicle's *Towing Capacity MUST BE GREATER THAN* the *Gross Vehicle Weight Rating (GVWR)* of your RV.**

Contact your automotive dealer to confirm the towing capacity of your vehicle, whether you are buying a new tow vehicle, or will tow your RV with one that you already own. Discuss the GVWR, size and type of RV that you will be towing. If you plan to purchase a new vehicle, some trucks can be purchased with an optional tow package.

Some automotive manufacturers publish brochures that discuss towing considerations. Ask your automotive dealer how to obtain a copy of this information. Verify that the weight ratings listed in the brochure are for your exact vehicle, i.e., the correct year, model, engine, transmission, suspension and any relevant options.



Keep a record of your license number and 17-digit vehicle identification number (VIN) in the event that theft or vandalism requires you to supply this information to the authorities.



WARNING

Grand Design RV disclaims any liability with respect to damages that may be incurred by a customer or owner of a Grand Design RV recreational vehicle as a result of the operation, use or misuse of a tow vehicle.

Vehicle Labels

Decals and data plates used throughout the RV aid in its safe and efficient operation; others give service instructions. Read all decals, data and instruction plates before operating your RV. If any decal, data or instruction plate is painted over, damaged or removed, it should be replaced.

Weight Ratings & Definitions

It is essential to understand and stay within the weight ratings of your RV and tow vehicle. Learning these definitions is the first step in safely managing your RV's weight and balance. Vehicle and trailer weight numbers fall into two categories:

- **Ratings** are maximum limits, NEVER to be exceeded. These limits are established by Grand Design RV and our component manufacturers in the design of the vehicle.
- **Weight** and **Load** are often used interchangeably. Weight is measured by putting an RV, tow vehicle or its components on a scale. Vehicles and cargo have **weight**, which impart **loads** to tires, axles, and hitches.

GAWR (Gross Axle Weight Rating) - GAWR is the maximum weight each axle is designed to carry.

GVWR (Gross Vehicle Weight Rating) - GVWR (also called *Maximum Loaded Trailer Weight*) includes the GAWR plus the hitch weight. It is the maximum allowed weight for a fully loaded RV or tow vehicle.

Gross (Trailer/Vehicle) Weight - Gross Weight is the total actual weight of your RV plus cargo, as measured on a scale.

UVW (Unloaded Vehicle Weight) - UVW is the weight of the RV as built at the factory. The UVW includes the empty LP bottles but does NOT include cargo, water, LP gas, or dealer-installed accessories.

Hitch Weight (or Tongue Weight) - is the amount of weight that presses down on the hitch when an RV is connected to a vehicle.

CCC (Cargo Carrying Capacity)

- **United States:** CCC is equal to GVWR minus the following: UVW and LP gas weight. *Water is considered cargo weight.*
- **Canada:** CCC is equal to GVWR minus the following: UVW, LP gas weight, and full fresh (*potable*) water weight (*including the water heater*).

For additional definitions, See **page 162**, Glossary.

WARNING

Exceeding a rating may result in unsafe conditions, potential damage, may void a warranty, may complicate an insurance claim, and in some cases, may violate a law.

WARNING

The actual total weight of the vehicle, all options, liquids, your personal cargo, and the hitch weight **is important to know** so that you **DO NOT exceed** the Gross Vehicle Weight Rating (GVWR) of the RV.

The volume of space available for storage **may exceed the amount of available Cargo Capacity.**

Large storage compartments have been designed to accommodate normal camping items, which are bulky, but not necessarily heavy.

Weight Labels

Vehicle weight labels are affixed to your RV to help you make an informed decision before your purchase. **DO NOT REMOVE THESE LABELS.** If the labels are missing, contact your dealer or Grand Design RV Customer Service for replacements.

Federal Certification Label

This label specifies the maximum capacities for GVWR, GAWR and tires. It is located on the forward, off-door-side exterior.

MANUFACTURED BY/FABRIQUÉ PAR: GRAND DESIGN RV, LLC DATE: 1/2013
 GVWR/PNBV 7257 KG (16000 LB)
 GAWR (EACH AXLE)/PNBE(CHAQUE ESSIEU) 3175 KG (7000 LB)
 UVW 5788 KG (12760 LB)
 TIRE/PNEU ST235/80R16 RIMS/JANTE 16X6 8-6.5
 COLD INFL. PRESS/PRESS. DE GONFL. À FROID 552 KPA (80 PSI/LPC)-SINGLE

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE. THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE. - CE VÉHICULE EST CONFORME À TOUTES LES NORMES QUI LUI SONT APPLICABLES EN VERTU DU RÉGLEMENT SUR LA SÉCURITÉ DES VÉHICULES AUTOMOBILES DU CANADA EN VIGUEUR À LA DATE DE SA FABRICATION.

V.I.N./N.I.V.: 573FS3821D1100001 TYPE/TYPE: TRAILER TRA/REM: FIFTH WHEEL

Tire and Loading Information Label

This label specifies the tire size information, recommended cold tire pressure, and the maximum amount of cargo that can be safely added to the RV. It is located on the forward, off-door-side exterior.

TIRE AND LOADING INFORMATION RENSEIGNEMENTS SUR LES PNEUS ET LE CHARGEMENT			
THE WEIGHT OF CARGO SHOULD NEVER EXCEED 1442 KG OR 3180 LBS. LE POIDS DE CHARGEMENT NE DEVRAIT JAMAIS EXCÉDER 1442 KG OU 3180 LBS			
TIRE PNEU	SIZE DIMENSIONS	COLD TIRE PRESSURE PRESSION DES PNEUS À FROID	SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION VOIR LE MANUEL DE L'USAGER POUR PLUS DE RENSEIGNEMENTS
FRONT AVANT	ST235/80R16	552 KPA /80 PSI	
REAR ARRIÈRE	ST235/80R16	552 KPA /80 PSI	
SPARE DE SECOURS	ST235/80R16	552 KPA /80 PSI	

573FS3821D1100001

Cargo Carrying Capacity (CCC) Label

This label specifies the maximum cargo carrying capacity and length of your RV. It is located on the side edge of your *Main Entry Door*.

RECREATION VEHICLE TRAILER CARGO CARRYING CAPACITY
 VIN: 573FS3821D1100001
 THE WEIGHT OF CARGO SHOULD NEVER EXCEED
 1442 KG OR 3180 LBS.
 CAUTION: A FULL LOAD OF WATER EQUALS 249 KG OR 548 LBS OF CARGO @ 1KG/L (8.3 LB/GAL)
 RECREATIONAL VEHICLE OVERALL LENGTH 39'11" AS MANUFACTURED

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Cargo Capacities

When loading cargo into your RV, **DO NOT exceed:**

- Maximum weight specified on the Cargo Carrying Capacity label.
- GVWR (Gross Vehicle Weight Rating).
- *Maximum Load Rating* of your RV tires.

Maximum Load Rating

The *Maximum Load Rating* of your RV tires is LESS THAN the GVWR. **To calculate the actual weight on your RV tires:** subtract the hitch weight from your RV's Gross Weight. The hitch weight is carried by your tow vehicle, not the RV tires.

For example:

- if your RV's tires are each rated at 2,000 lbs.
2,000 lbs. x 4 tires = 8,000 lbs.
- Gross Weight is 9,000 lbs.
with a hitch weight of 1,200 lbs., *then*
9,000 lbs. - 1,200 lbs. = 7,800 lbs.

The *actual weight* on the RV tires is 7,800 lbs.,
This is under the load rating of the tires.

- **7,800 lbs. ÷ 4 tires = 1,950 lbs. each**

Water and Propane

- Your FRESH WATER is treated as *CARGO WEIGHT*.
- Water weighs approximately 8.34 lbs. per gallon.
 - 50 gallons of water weighs 417 lbs.

If you are close to your GVWR, **reducing** the amount of water in the holding tank will **increase** the amount of available cargo weight by the same amount. This flexibility allows you to make choices that fit your travel and camping needs.

Remember:

- Unloaded Vehicle Weight is calculated with empty LP bottles.
- Cargo Carrying Capacity is calculated including the weight of full LP bottles. **CCC = GVWR - (UVW - LP gas weight)**

If you have further questions, please contact your dealer or Grand Design RV Customer Service.

WARNING

The load capacity of your RV is designated by weight, not by volume. All available storage space cannot necessarily be used when loading the RV.

For the best possible handling:

- DO NOT exceed your GVWR.
- Ensure you are loading the vehicle evenly.
- To prevent shifting during travel, secure heavy items.

 **WARNING**

ONLY store items in the areas designated for storage.
DO NOT store anything in the areas reserved for the furnace, water heater, converter, or electrical panels, etc.

 **WARNING**

NEVER load the RV in excess of the GAWR for either axle.
Overloading the RV may result in adverse handling characteristics & damage to the chassis.

 **WARNING**

DO NOT EXCEED YOUR GVWR! This means you should weigh your RV as loaded for your normal travel to determine the actual weight.
If you exceed the GVWR, you MUST remove items from the RV, or drain liquids, then re-weigh the RV to ensure you have achieved a safe weight.
DO NOT travel with full grey/black holding tanks. This not only wastes gas but, depending upon the location of the grey or black holding tanks, can affect handling characteristics.

Loading Your RV

Evenly distribute your cargo **side-to-side** for safe travel.

- The weight on each tire **must not exceed** one-half of the GAWR (Gross Axle Weight Rating) for either axle.

DURING A SUDDEN STOP, free-standing furniture or overlooked items on the countertop/range can become dangerous projectiles.

- It is important to secure the appliance or furniture tie down straps (if so equipped).
- **Store** and **Secure** all LOOSE ITEMS inside your RV. Check that all items are safely put away BEFORE travel. (*i.e., canned goods, pots & pans, small appliances, etc.*)

Weighing Your Tow Vehicle & RV

- **TOTAL WEIGHT** and **BALANCE** are the two most important factors when loading your RV.
- ALWAYS verify that your loaded RV is in compliance with all applicable weight ratings.

Weigh your RV at a public scale to confirm that your loaded RV complies with all vehicle, tire and axle weight ratings. This will also help you to determine the proper load distribution.

- The area around the scale **must** allow for weighing each side of your RV.
- Individual scales may operate differently.

Traveling while your RV is OVERLOADED or with a load that is UNBALANCED:

- Will ADVERSELY AFFECT your tow vehicle's HANDLING
- Can cause COMPONENT FAILURE

OVERLOADING your RV will VOID:

- The Limited Towable Base Warranty,
- The Limited Towable Structural Warranty,
- The Limited Towable Frame Warranty, and
- The Manufacturer warranties of many component parts.

To weigh your *Tow Vehicle and RV*

BEFORE you begin, read through all the weighing instructions. Your RV must be weighed FULLY LOADED (*i.e., with food, water, clothing, supplies, propane, fuel, etc.*).

1. Weigh your RV while **unhitched** from the tow vehicle to obtain your *Gross Vehicle Weight* (GVW).
 - **FOR SAFE OPERATION:** Your RV's GVW **must** be *LESS THAN* or *EQUAL TO* the GVWR.
 - **If your RV's weight is GREATER THAN the GVWR,** then you **must** REMOVE contents until the weight is in compliance with your RV's listed ratings.

2. Hitch your RV to the tow vehicle. Weigh the RV and tow vehicle to obtain your *Gross Combined Weight* (GCW).
 - Confirm that **your GCW** is *LESS THAN, or EQUAL TO* the *Gross Combined Weight Rating* (GCWR) specified by the manufacturer of your tow vehicle.
 - **If your GCW is GREATER THAN the GCWR,** REMOVE contents until the weight is in compliance.

3. *While still hitched to the tow vehicle,* PULL onto the scale to weigh **ONLY the RV**, and RECORD the weight. *This measures the total load carried by the RV tires.*
 - The difference of this weight, subtracted from the GVW is your *Hitch Weight*.

4. To obtain the side-to-side weights, there **must** be enough space on either side of the scale to accommodate the RV being partially off the scale.
 - Pull the RV so that the tires of **only one side** are on the scale. Your RV **must** remain as level as possible.
 - **For a BALANCED load:** The weight of one side of your RV, **must** be *EQUAL TO one half* of the weight determined in step #3.
 - **If the weight of one side of the RV is NOT EQUAL to one half of the weight from step #3,**
Then you **must** REDISTRIBUTE the load until the RV is equally balanced side-to-side.

When a load is **unbalanced**, the components on the heavier side (*tires, wheels, brakes, springs, etc.*) may be **overloaded**, even though the total axle load is within the GAWR.

If you have further questions, consult with your dealer or the scale operator.

WARNING

Exceeding the established weight ratings for the axles, running gear, tires and wheels can lead to failure that can affect motor vehicle safety and lead to property damage or damage to the RV.

WARNING

Total weight of your tow vehicle and RV must not exceed the GCWR. DO NOT assume that you can tow an RV that happens to be within the capacity of the tow vehicle hitch. By doing so, you may exceed the total GCWR of your tow vehicle and RV towing combination.

WARNING

It is important to redistribute the load to avoid component failure as well as to improve the handling characteristics of the vehicle.



Tire Safety Information

This portion of the Owner's Manual contains tire safety information as required by 49 CFR 575.6(4) and is based in part on the National Highway Traffic Safety Administration's (NHTSA) brochure titled *Tire Safety, Everything Rides On It*.

It is available as a free download on the NHTSA website:

rosap.nhtl.bts.gov/view/dot/16477

Studies of tire safety show that the most important things you can do to avoid tire failure, blowouts and flat tires are:

- MAINTAIN proper tire pressure.
- OBSERVE tire and vehicle *Load Limits*.
 - NEVER carry more weight in your vehicle than your tires or vehicle can safely handle.
- AVOID road hazards.
- DRIVE within the designated tire speed ratings.
- INSPECT tires for cuts, slashes, and other irregularities.

These actions, along with other care and maintenance activities, can also:

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

Make tire safety a regular part of your vehicle maintenance routine. Know that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

Tire Maintenance - Safety First

Proper tire maintenance improves the stopping distance, traction, steering, and load-carrying capability of your vehicle. As mentioned above, to prevent 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.

See **page 46**, *Tire Safety Tips*.

Maximum Load Rating

The *Maximum Load Rating* indicates the maximum load in kilograms and pounds that can be carried by the tire.

Maximum Permissible Inflation Pressure

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

Recommended Tire Pressure & Load Limits

UNDER-INFLATED TIRES and OVERLOADED VEHICLES are the major causes of TIRE FAILURE. Tire information placards and vehicle certification labels provide important information on tires and load limits, *including*:

- Recommended Tire Size
- Recommended Tire Inflation Pressure
- Cargo Weight
(the *maximum* cargo weight the RV is designed to carry)
- Front and Rear Gross Axle Weight Ratings (GAWR)
(the *maximum* weight the axle system is designed to carry)

For the label locations and more detailed information, See **page 37**, *Weight Labels*.

Understanding Tire Pressure & Load Limits

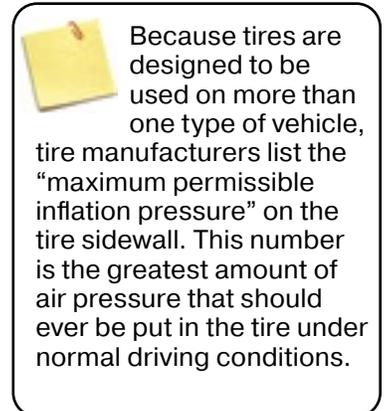
Load Limits are determined by the tire size and the greatest amount of weight each tire can safely carry.

Tire Pressure is the amount of air pressure a tire requires to be properly inflated. It is measured in pounds per square inch (PSI). Tire pressure affects your RV's overall performance and provides the load-carrying capacity.

On the *Tire and Loading Information Label*, the proper tire pressure for your vehicle is listed as **Cold Tire Pressure**. You will find this number expressed in both PSI and kilo-pascals (KPA), the metric measurement used internationally.

It is difficult to obtain the recommended tire pressure when the tires are not cold.

See the **Next Page**, *Checking Tire Pressure*.



 **WARNING**

Always check tire pressure when tires are cold. Cold tire inflation pressure is defined as a tire that has not been used for three or more hours, or has been driven less than one mile.

Tire inflation pressure of a hot tire may show an increase as much as 6 PSI over a cold tire. **DO NOT exceed the maximum recommended pressure.**

Checking Tire Pressure

It is important to check the cold inflation pressure of your RV's tires at least once per month for the following reasons:

- Most tires will lose air naturally over time.
- Tires can lose air suddenly by driving over a pothole, hitting road debris, or striking the curb when parking.
- With radial tires, it is usually not possible to determine under-inflation by visual inspection.

For safety and convenience, purchase a Tire Pressure Gauge to keep in your vehicle. They are sold at auto parts stores, hardware stores and many other retail outlets.

Steps for maintaining proper tire pressure

1. The recommended cold inflation pressure, is listed on the *Tire and Loading Information label* located on the off-door-side, forward exterior of your RV.
2. Use a *Tire Pressure Gauge* (customer supplied), to check the tire pressure of all tires.
 - a. If the tire pressure is *TOO HIGH* in any of the tires, gently press on the tire valve stem with the edge of your tire gauge. Slowly release air until the correct pressure is reached.
 - b. If the tire pressure is *TOO LOW* in any of the tires, this can be a serious **safety hazard**. Add air to any *UNDER*-inflated tire as-soon-as possible.
3. At a service station or using a portable air compressor, **ADD** air to each under-inflated tire until the correct cold inflation pressure is reached. **DO NOT over-inflate.**
4. **Re-check** the RV tires with the *Tire Pressure Gauge*. Confirm that all four (4) tires are at the same recommended cold inflation pressure. **Adjust** as needed.

*While it is ideal to check and fill tires when they are cold, **if you discover an RV tire that is UNDER-inflated, even after you have been driving & the tires are warm:***

- **ADD** air until the *recommended cold inflation pressure* is reached.
- The warm tire may remain *slightly* under-inflated, but this is much safer than driving with a *significantly* under-inflated tire. **This fix is ONLY temporary.**
- **REMEMBER** to **re-check & adjust** the tire pressure as-soon-as a cold reading can be obtained.

How Overloading Affects Your RV & Tires

- **OVERLOADING** your RV can have serious consequences for passenger safety.
- **OVERLOADING** your RV can make your tow vehicle **hard to DRIVE and hard to STOP.**

Too much weight on your vehicle's suspension system can cause spring, shock absorber, or brake failure. It can also result in, handling or steering problems, irregular tire wear, tire failure, or other damage.

- In cases of serious overloading, **brakes can FAIL completely**, particularly on a steep grade.

Tire overloading caused by an excessive load and/or tire **UNDER**-inflation results in abnormal tire flexing. *This can generate an excessive amount of heat within the tire.*

- **EXCESSIVE HEAT MAY LEAD TO TIRE FAILURE.**
- **PROPER INFLATION IS CRITICAL.** It is the air pressure that enables a tire to support the load.

The load a tire can safely carry is established by a combination of the tire size, the load range, and corresponding inflation pressure. The required air pressure for your RV tires **must** be determined from your actual load (*by weighing the RV*) and taken from the *Load and Inflation Tables* provided on the tire manufacturer's website.

- These air pressures may differ from those found on the certification label.
- RV weight or tire pressure should **never exceed** the tire's *Maximum Load Rating* or maximum air pressure.
- **If you discover that your tires cannot support the actual weights**, REMOVE contents until the RV's weight is in compliance.

Steps for determining correct load limit

1. Locate the statement "The weight of cargo should **never exceed** XXX KG or XXX LBS" on your RV's Cargo Carrying Capacity label.
 2. This figure equals the amount of **available load capacity** for cargo and luggage.
- **The combined weight of cargo and luggage loaded on your RV must not exceed the available load capacity.**

DANGER

If the total weight of the RV exceeds the GVWR, the trailer is overloaded.

Operating your RV while exceeding the specified weight ratings increases the risk of a crash, personal injury and death.

It is necessary to remove payload (equipment, water, personal belongings, etc.) until the total weight of the RV no longer exceeds the GVWR before operating the RV.

DANGER

If the weight on the axles *exceeds* the GAWR, then the axles are **overloaded**.

Operating your RV while exceeding the specified weight ratings increases the risk of a crash, personal injury and death.

It is necessary to remove or rearrange payload (equipment, personal belongings, water, etc.) until the axle weight no longer exceeds the GAWR before operating the unit.

Not operating your RV within the designed weight ratings can damage your recreational vehicle which is not covered under warranty.

Tire Safety Tips

Preventing tire damage

- DO NOT run over curbs or foreign objects in the roadway or when parking.
- *SLOW WAY DOWN* if you can not avoid a pothole or other object in the road.

Tire safety checklist

1. CHECK tire pressure *at least* monthly, including the spare.
2. INSPECT tires for uneven wear patterns on the tread, cracks, foreign objects, or any other damage.
3. *Carefully* REMOVE bits of glass or foreign objects wedged in the tread.
4. CHECK that all tire valves have valve caps.
5. CHECK tire pressure before going on any trip.
6. **DO NOT overload your vehicle.**
 - FOLLOW the instructions for cargo and cold tire pressure found on your *Tire and Loading Information* label.

Tire Labeling

Federal law requires that tire manufacturers provide standardized information molded into the sidewall of all tires sold in the U.S. This includes the tire's size, construction, various capacities (max. pressure, load, speed) and the *Tire Identification Number*.

US DOT Tire Identification Number (TIN)

The *Tire Identification Number* is provided for safety standard certification and in the event of a recall. More than just a serial number, this code identifies the specific production run of a tire.

- The **TIN** always begins with "DOT" usually followed by 10-12 numbers, letters, or symbols.
- The *first* two (2) numbers or letters following DOT, are the **plant code** where the tire was manufactured.
- The *last* four (4) numbers show the **week** and **year** the tire was built. ***For example:***
 - **3119 = the 31st week of 2019.**
- The other characters in the TIN are codes used at the tire manufacturer's discretion and vary by company.

Tire Load Range, Composition & Materials

Each layer of rubber and other materials used in tire construction is called a *ply*. Since modern tire construction uses fewer, stronger plies, *Tire Load Range* has replaced the older measurement of Ply Rating. *Tire Load Range* is a classification to describe a tire's ability to carry weight and hold air pressure, as opposed to information about the actual number plies in a tire.

- Tire manufacturers must report all materials used in their tire's composition (*rubber, steel, nylon, polyester, etc.*)
- For more information, please contact the tire supplier information on **page 14**.

Tire Size & Type Designation

To maintain tire safety, new tires purchased should match the OEM specifications of your RV's original tires. The tire specifications are found on your *Tire and Loading Information label* or the sidewall of the tire you are replacing.

The tires on your unit may for example, be marked with a designation of **ST 225/75R15**. *ST* stands for *Standard Trailer*, and the number breaks down as follows:

- The first three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.
- The next two-digit number after the "slash" mark, gives the height to width ratio of the tire. This is also known as the aspect ratio.
- The "**R**" stands for radial.
- The last two-digit number is the diameter *in inches* of the wheel or rim.

For further information, please contact a tire dealer or Grand Design RV Customer Service.

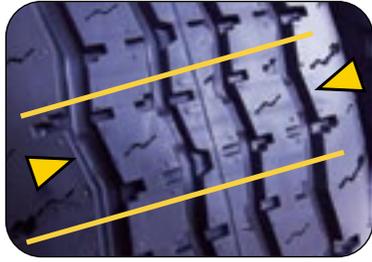
Speed Rating

- Typical **ST** tires have a speed rating designation of "**L**", which is 75 mph (under normal inflation and load conditions).
- **DO NOT exceed the Speed Rating** regardless of the posted maximum speed limit.

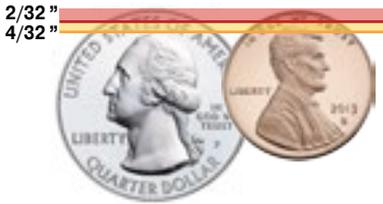
Tire Warranty

- **Tires are warranted by the TIRE MANUFACTURER, not by Grand Design RV.**

If you need tire warranty assistance, please refer to the tire warranty information provided in your Owner Information Package or contact your dealer.



Tire Tread Wear Bars



Tire Tread

The tire tread provides the gripping action and traction that prevent your vehicle from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch.

Tread wear bars are raised sections built into the bottom of a tire's tread grooves that show how much tread is remaining. When they appear "even" with the outside of the tread, it is time to replace your tires.

The Penny & Quarter Tests

Place a penny or quarter upside down into the tire groove.

- **Penny** - If you can see the top of Lincoln's head, you are ready for new tires.
- **Quarter** - If you can see the top of Washington's head, tires are OK but close to wearing out.

Inspect your tires regularly for uneven tread wear.

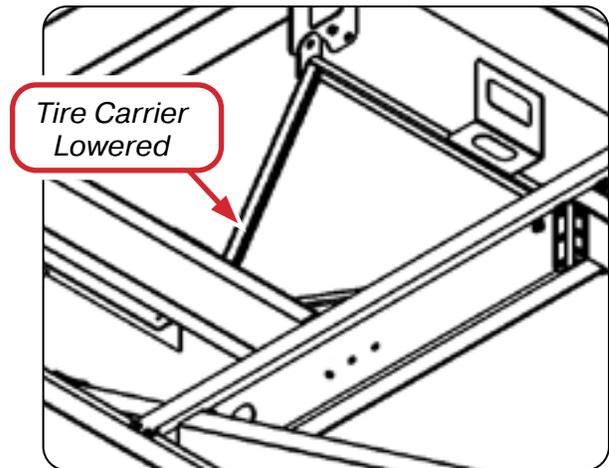
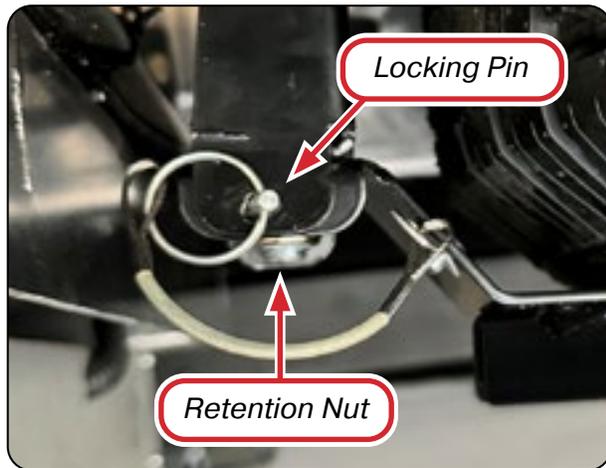
Wear Pattern	Possible Cause	Solution
 Edge Wear Thin Tread Wear on Tire Edges	Under Inflation	Fill tire with an air compressor to the Recommended Cold Tire Pressure
 Center Wear Thin Tread Wear Center of Tire	Over Inflation	Press tire valve stem, slowly release air until reaching the Recommended Cold Tire Pressure
 Side Wear Exaggerated Inner <i>or</i> Outer Tread Wear	Loss of Camber <i>or</i> Overloading	Make sure your load does NOT exceed the axle rating.
 Toe Wear Thin Inner <i>or</i> Outer Edge	Alignment <i>or</i> Incorrect Toe-in	Correct Toe-In is 0 - 0.5 degrees
 Cup Wear Diagonal "Scalloped" Tread Wear	Loose Bearings <i>or</i> Wheel Balance	Check Bearing Adjustment <i>and</i> Tire & Wheel Balance
 Flat Spots Flat Spots <i>or</i> Patchy Tread Wear	Tire Skidding Wheel Lock Up <i>or</i> Out of Balance	Avoid Sudden Stops, Adjust Brakes Check Tire & Wheel Balance

Spare Tire

Use your spare tire if a trailer tire is damaged, flat, or loses air pressure. ***The spare tire/wheel may differ from the original equipment, and is intended for temporary use ONLY.***

The spare tire carrier is a hinged strut-assist tire retention device that is integrated into the frame below your RV. It is located in the center of the trailer frame just forward of the independent suspension.

- The strut-assist dampens the downward force of the carrier when opened.



Open/Lower the carrier:

1. ACCESS the carrier from the door side of the trailer.
2. UNSCREW the retention nut from the retention post with a $\frac{3}{4}$ " wrench/socket.
3. RELEASE the locking pin while applying upward pressure to the tire carrier and allow the carrier to open.
4. *Once the carrier is open, PULL the spare tire from the carrier.*

Closing the carrier:

1. ACCESS the carrier from the door side of the trailer.
2. LIFT the front of the carrier into place and insert the locking pin into place.
3. *Once the pin is in place, use a $\frac{3}{4}$ " socket/wrench to screw the retention nut onto the retention post until the tire/carrier is securely in place.*

Maintenance:

Periodically inspect the retention nut and secondary locking pin to ensure that they are in place and properly functioning.

WARNING

Before working underneath the RV, the frame must be supported with jack stands in front and behind the wheels of the unit. Failure to do so may result in serious injury or death.

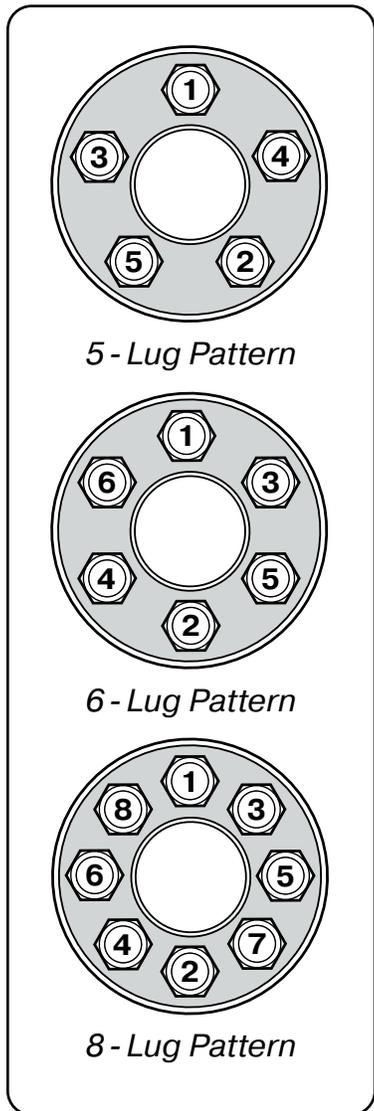


SCAN the QR Code, above, with the camera on your smartphone or tablet to download the *Positioning a Floor Jack Under the BAL NXG Frame.*

! WARNING

Always torque the wheel nuts to the specifications of the wheel manufacturer.

Over or under-torqued wheel nuts can cause the wheel to separate from the wheel mounting surface during operation, causing property damage, personal injury or loss of life.



Wheel Nut Torque

- The lug nuts on your RV wheels require frequent torque maintenance.
- Torque is the amount of rotating force applied to a fastener, such as a lug nut.

Your RV's axle and wheel assemblies are designed differently than those of a car. The RV's overall size, weight, and center of gravity subject the wheels to pressures unique to trailering. During normal cornering, the tires and wheels experience a considerable amount of stress called Side-Load.

- **ALWAYS use a properly calibrated torque wrench to confirm proper torque.**
- **ALWAYS check lug nut torque on each wheel before departure, regardless of how short the trip may be.**
- DO NOT allow UNDER-torque or OVER-torque on any wheel. Under or over-torque can be dangerous or cause damage.

Find the Wheel Size, Material, & Stud Size for your RV on the Wheel Torque Requirement Table (Below)

Stud Size	Lug Nut Type	Final Torque Specifications	Wheel Size	Wheel Material
1/2"	Coned	90-120 ft. lbs.	14"/15"/16"	Steel
9/16"	Coned	120-140 ft. lbs.	16"	Steel
1/2"	Coned	90-100 ft. lbs.	14"/15"/16"	Aluminum
9/16"	Coned	120-140 ft. lbs.	16"	Aluminum
9/16"	Coned	140-170 ft. lbs.	17.5"	Aluminum

If Changing the Tire/Wheel:

- Tighten the lugs in the correct order for your RV's lug pattern shown in the diagram. (Left)
- Start all lugs by hand until snug, then tighten the lugs in three (3) stages.

1st Stage - Tighten all lugs to 20-25 ft. lbs.

2nd Stage - Tighten to 50% of Final Torque Specification.

3rd Stage - Tighten to the Final Torque Specification.

- Determine the correct torque for each stage, and use the Final Torque Specification shown.

Roadside Emergency

A roadside emergency can happen at any time. **ALWAYS** carry an emergency kit with three red warning signs (*or indicators*) to display if necessary.

If you must make an emergency roadside stop:

- Pull off the road *as far as possible*.
- Turn **ON** the hazard warning flashers (*or hazard lights*) to alert other drivers.
- The hazard warning flashers warn passing drivers to approach and overtake your vehicle with caution.

Place the three (3) Red Warning Indicators (*signs, reflectors, lanterns, or road flares*) as follows:

1. **1st** indicator **10 feet behind** the RV on the off-door side (*road side*).
 2. **2nd** indicator **100 feet behind** the RV in the center of the lane.
 3. **3rd** indicator **100 feet in front** of the RV in the center of the lane.
- **10 feet = 4 paces, 100 feet = 40 paces**
 - Curves and/or hills may affect the safe placement of the warning indicators.

FOR YOUR PERSONAL SAFETY in the event of a roadside emergency, ALWAYS STAND:

- **OFF** of the road, *and*
- **AWAY** from any traffic.

Emergency Towing

If you require towing, please contact an emergency road service provider or a certified service facility for assistance.

Tire Linc[®] Prep - TPMS (customer supplied)

Your Serenova TT is pre-wired for the Lippert Tire Linc[®] System. Tire Linc[®] is a tire pressure and temperature monitoring system (TPMS). The TPMS issues an alert via the Alert Indicator or the Compass Connect App. when the tire pressure or temperature of your trailer's tires falls out of the programmable range.



Tire Linc[®]
Repeater Dock

Please contact your Grand Design RV Dealer for more information and Ordering.

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Towing & Leveling

To improve safe driving and help protect against injury, please follow these recommendations:

- Keep the RV and tow vehicle tires properly inflated, *and REPLACE* the tires **BEFORE** they are excessively worn.
- **ALWAYS** wear your seatbelt and obey all traffic laws.
 - **DO NOT** exceed the posted speed limit.
 - Many states have *lower* speed limits for tow vehicle/RV combinations.
- **ALWAYS** be a courteous and alert driver.
 - Watch out for other drivers, bicyclists and pedestrians.
 - Pay attention to traffic and road conditions.
 - **BEFORE** changing lanes, check the outside rear view mirrors for other vehicles and use your turn signals.
 - Leave room for sudden braking and other unexpected events.
- **ALWAYS** use the daytime running lights on your tow vehicle to increase visibility to other drivers.
- **NEVER** drive when you are sleepy or tired.
- **NEVER** drive when alcohol, drugs or medication have affected your judgment, reflexes or alertness.
- Adverse weather conditions or extreme terrain may affect your tow vehicle's performance and handling.
 - **DO NOT** use the tow vehicle's cruise control on icy, wet, or winding roads; or any other traffic situations where a constant speed could be dangerous.

Propane Safety

- **ALWAYS** shut OFF the propane system at the LP cylinder **BEFORE** you travel.
- If you drive with the propane system ON, the dangers are greatly increased in the event of an accident or fire.
- See **page 105**, *Propane System*.

WARNING

DO NOT leave children or pets unsupervised in or around the RV (even if children are secured by a child restraint system).

They could:

- Injure themselves on parts of the RV.
- Unlock and open the entry door or open the emergency exit window and possibly injure other person(s) or damage property.
- Get out of the RV and injure themselves or they could be injured by passing vehicles.
- Be seriously or even fatally injured by prolonged exposure to extreme heat or cold.

WARNING

You must observe the law if you are driving when operating a cell phone in your tow vehicle. If it is permitted to operate a cell phone while the tow vehicle is in motion, you must only operate it when road and traffic conditions permit. You may otherwise be distracted from the traffic conditions, cause an accident and injure yourself and others.

RV Driving Schools & Seminars

If you have any concerns about driving while towing an RV, consult an expert for specific RV driver education. There are private RV schools and some RV owner's organizations that offer driving seminars. The schedules and locations of the various RV driver education seminars and schools can be researched through RV-related publications and websites.

Please use caution when using websites as a resource tool. Verify the information is from a credited and reliable source in the RV industry, and pertains to your specific RV. If in doubt, contact your dealer for assistance.

RV Braking System

To maintain proper braking performance, both the RV and tow vehicle brakes *must* be used together. The RV brakes are designed to work with your tow vehicle brakes. Separate use of the braking systems will cause accelerated wear and damage.

For best performance and increased durability, AFTER the initial break-in period, your brake shoes *must* be adjusted accurately. When your RV is new, it is impossible to adjust the brake shoes precisely. It takes approximately 1,000 miles and/or 50 medium to heavy stops to *burnish fit* or *seat* the shoes to the brake drum.

Braking system components include:

- Tow vehicle battery
- Brake controller
- Breakaway switch
- Wire harness/connector plug
- Auxiliary batteries (see Electrical System)

Tow Vehicle Battery

The tow vehicle battery is the primary source of power for your RV's brake operation. To ensure available power when needed, keep your tow vehicle battery and charging system working properly.

Battery Isolator (Customer Supplied)

You may want to install a *Battery Isolator* on your tow vehicle. A *battery isolator* is a device that:

- Receives current from the tow vehicle alternator to independently charge both the RV auxiliary battery and the tow vehicle battery.
- Prevents the RV from draining your tow vehicle battery (so you can start your tow vehicle engine).

Your dealer can assist you with the selection, purchase and installation of this aftermarket part.

Brake Controller (Customer Supplied)

The brake controller should be installed in the tow vehicle to work in conjunction with the RV electric brakes. Consult with your dealer or the brake controller OEM to decide what is right for your towing combination.

Breakaway Switch

The breakaway switch is located on the A-frame. It is a crucial part of the RV braking system. If the RV becomes detached from the tow vehicle, the lanyard pulls the pin from the breakaway switch, which automatically activates the RV brakes.

- While hitching the RV, ALWAYS secure the breakaway switch lanyard to a permanent part of the tow vehicle.
- Check that your auxiliary battery (customer supplied) is correctly installed, and fully charged BEFORE travel.

An AUXILIARY BATTERY (customer supplied) MUST be installed to provide power to the breakaway switch.

WARNING

Be certain there is enough “slack” in the lanyard (cable) to accommodate a tight radius turn. Failure to do so may result in the breakaway pins pulling out of the housing causing the brakes to engage while towing. This could result in significant damage.

WARNING

NEVER use the breakaway switch and trailer brake system as a parking brake. Doing so would create a high amp draw on the battery and converter.

This can cause non-warranty damage to the breakaway switch, wiring, & connectors.



DO NOT remove the following label from the A frame:

SAFETY BREAK-AWAY SWITCH WILL NOT OPERATE
unless connected to a power source equivalent to or greater than an automotive type 12 volt, 12 amp hour wet-cell battery.

CAUTION

It is the responsibility of the end user to ensure that their electric brake controller is compatible with the Dexter Tow Assist System.

Dexter attempts to provide compatibility with most controllers available but is unable to anticipate design changes that might be introduced by the various controller manufacturers.

ABS - Anti-Lock Braking System (If So Equipped)

Your Serenova is equipped with the Dexter Tow Assist® system providing Anti-Lock Braking (ABS), Sway Mitigation, and a towable odometer.

BEFORE using your *Tow Assist*® System: Please read and understand the *Dexter Tow Assist*® *Owner's Manual* found in your *Owner Information Package*. See photo, top right.

Tow Assist Compatibility Guidelines

It is important to download and read the Tow Assist Compatibility Guidelines. This document includes the table below, left.

- Information on Tow Assist Compatibility Guidelines are available in instruction sheet **059-A23-00** available at: dexteraxle.com

After Market Trailer Brake Controller Compatibility**

After market Brake Controllers		
Manufacturer	Model	Compatible
Dexter®	Predator DX2®	Yes
Tekonsha®	Primus IQ™	Yes
	Prodigy P2®	Yes
	Prodigy P3®	Yes
	Sentinel™	No
	Voyager®	No*
Hayes	Energize III®	Yes
	Endeavour®	Yes
	G2 Brake Boss®	Yes
	Genesis®	No*
Red Ace®	Tow-Pro (EBRH-ACC)	Yes
	Tow-Pro Elite (EBRH-ACC V2)	Yes
Hopkins®	Agility™	Yes
	Insight™	Yes
GSL	RBC-12	Yes
	XLE-12	Yes
Hayman Reese	Compact IQ®	Yes
Curt™	Tri-flex™	Yes

Vehicle Integrated Trailer Brake Controller Compatibility**

GM	High Confidence
Ford	High Confidence
Dodge	High Confidence
Toyota	High Confidence
Nissan	Untested

* Compatible with external simulated load

**As of January 2021

Operation

The Tow Assist system works in collaboration with an in-vehicle Electric Trailer Brake Controller to improve the safety and stability of trailer braking. The primary trailer braking control remains the responsibility of the Electric Brake Controller and the vehicle driver. Tow Assist will intervene when it determines the safety of braking is compromised and the system can improve the situation.

The goal of the Tow Assist system is to improve the safety of the trailer braking and stability, while also ensuring trailer braking efficiency or reliability is not reduced.

The *Tow Assist*® System requires a 7-way (or similar) tow vehicle connector. This connector must have Auxiliary +12V Power wired at position 4, which is typically a black wire. This connection is how the Tow Assist system is powered. The system will not work without power from this connection. Your tow vehicle may have the 7-way connector without the +12v terminal activated. Please consult your vehicle's owner's manual or a certified service center to verify that your connector has the proper power connection.

Dexter Phone App

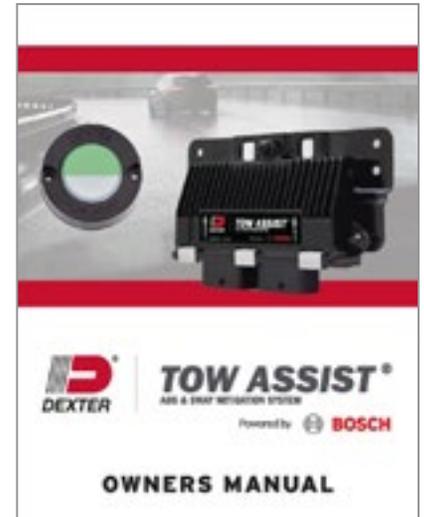
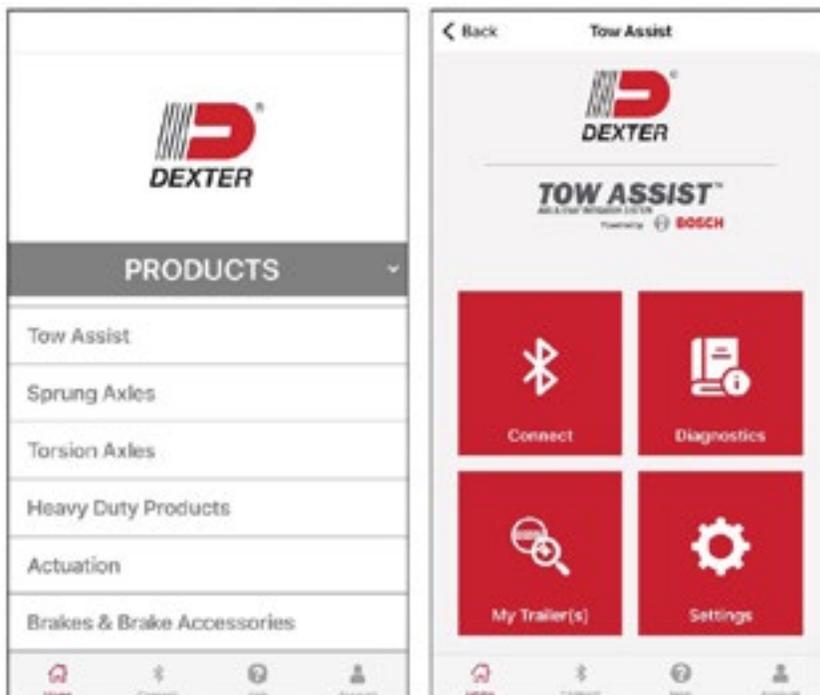
The Dexter app has many features, including access to product information, manuals, instructions, and a dedicated section for the Tow Assist system. The app is available in both Google Play™ store or the Apple App Store®.

The Tow Assist interface portion of the app allows users to:

- Create and manage account
- Manage multiple trailers
- Read trailer odometer
- Diagnose and learn about system faults
- Save information about readings and faults
- Reset the Tow Assist Controller (ECU)

The Tow Assist portion of the phone app requires the supplied Bluetooth communication adapter (*Dexter Part #058-037-00*) to communicate with the Tow Assist System. Plug the Bluetooth adapter into the OBD2 harness connector located near the front of your trailer. Contact your trailer manufacturer if the OBD2 connector is not easily visible. See the images below for reference. Remove the adapter when not in use to protect from environmental extremes.

Please note that the app is meant to read information from the Tow Assist ECU only. Only the trailer manufacturer can write to the ECU with specialized software.



The Dexter Tow Assist® Owner's Manual is found in your Owner Information Package.



SCAN the QR Code, above, with the camera on your smartphone or tablet to download the Dexter Tow Assist® Owner's Manual.

WARNING

ALWAYS use safety chains when towing your RV.

Safety chains maintain the connection between the RV and tow vehicle in the event the trailer becomes detached during travel.

Safety Chains

Safety chain requirements vary from state to state. Your RV is equipped with chains to meet SAE standard requirements for maximum gross trailer weight.

- ALWAYS have the safety chains attached when towing.
- Hook them to the safety chain loops provided on the tow vehicle's hitch, crossing them under the trailer tongue.

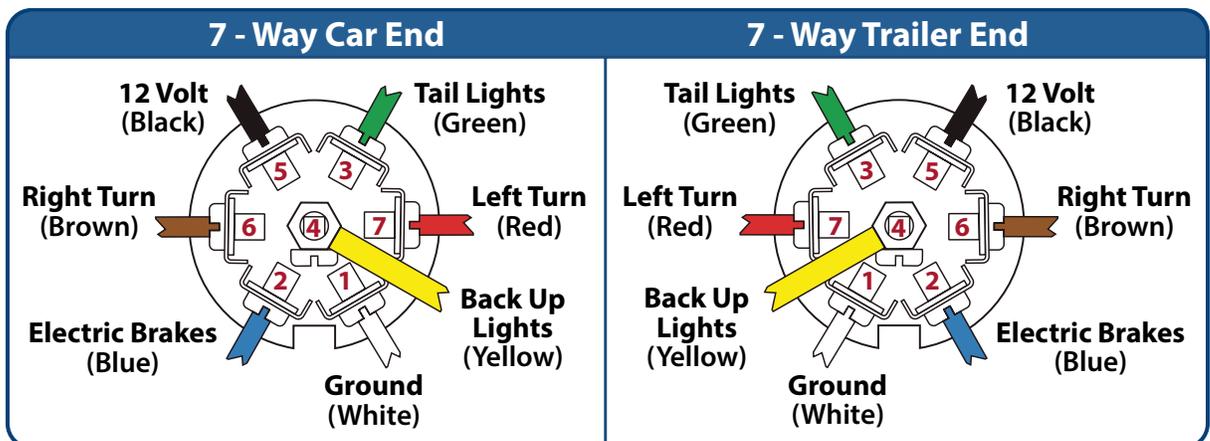
Inspect the length of the chains once attached to the tow vehicle frame. They should be long enough to allow for sharp turns, but short enough so they do not drag on the ground. Slack for each length should be the same but not more than necessary to permit the vehicle to turn at its minimum radius.

7-Way Wire Harness/Connector Plug

The *7-Way Wire Harness/Connector Plug* connects electrical power from your tow vehicle to your travel trailer during travel. It supplies power to the RV brakes, tail lights, clearance lights, turn signals, brake lights, etc.

Maintenance

Corrosion may build up with extended use. CLEAN your *Connector Plug* as needed to ensure good electrical contact. INSPECT the *7-Way Wire Harness/Connector Plug* periodically for cracking and wear to make sure connections stay protected from the elements as you travel. REPLACE if cracked or broken.



Tow Vehicle Hitch (Customer Supplied)

There are many types of hitches available. The hitch type that you select will affect the towing and handling characteristics of your RV. Installing the correct hitch on your tow vehicle is critical to a safe towing experience.

- Your Serenova TT requires a tow vehicle frame mounted hitch. Consult your dealer for which class and type of hitch to purchase for your TT /tow vehicle combination.
- BEFORE selecting a hitch, you must know the *GVWR* and *HITCH WEIGHT* of your RV.
- A hitch is assigned a *Hitch Class Rating* based on its maximum towing capacity and receiver opening size.
 - **The Maximum Towing Capacity of your hitch must be *HIGHER THAN* your GVWR.**
- The *hitch class rating* also gives a maximum hitch weight.
 - **The Maximum Hitch Weight for your hitch must be *HIGHER THAN* your hitch weight.**

There are a variety of tow vehicle suspension systems available that will affect the ball/hitch height, the levelness of a connected RV, and ride stability.

- A suspension that is too stiff, will increase vibration and bounce, accelerating wear on your tow vehicle and RV combination.
- Equipment that gives your vehicle a softer ride, can sometimes accentuate swaying when pulling an RV.

Please consult your dealer to assist you with purchasing a compatible hookup.

Hitch Weight

Maintain the *hitch weight* of your trailer when your cargo changes or is reloaded. Adjust to stay within the approximate target range of 10–15% of your overall Gross Weight (travel trailer *plus* cargo).

- If your hitch weight *EXCEEDS* the *upper weight limit*, shift some cargo toward the rear of your RV.
- If your hitch weight is *LESS THAN* the *lower weight limit*, shift some cargo toward the front of your RV.

NOTE: The *Cargo Weight* **must** be BALANCED side-to-side, then SECURED in place.

CAUTION

DO NOT overload your tow vehicle.

- Using an oversized or undersized tow vehicle hitch can cause damage to the RV frame.
- Grand Design RV cannot be responsible for the tow vehicle suspension system.
- The final ball height after the two vehicle/travel trailer towing combination is completely hooked up is a factor that must be considered.
- To avoid overloading your trailer axles and to minimize possible handling difficulties, your trailer should be level when hooked to your tow vehicle.

WARNING

Too much hitch weight can lift the tow vehicle's front wheels to the point where steering response, traction and braking are adversely effected. Suspension or drivetrain damage can result.

Too little hitch weight can diminish rear-wheel traction and cause instability, swaying or jackknifing.

Hitch Height & Hitch Ball

To determine your RV hitch height, make sure the RV is level. When the loaded trailer is hitched to the tow vehicle, check the hitch ball height by measuring the distance from the center of the hitch ball to the ground. Record your RV hitch height measurement in the box for future reference.

- **To adjust the weight-distributing hitch to the proper height, refer to the hitch manufacturer instructions.**
- Adjust the equalizing bars of the hitch assembly until the tow vehicle and the RV are essentially level.
- A **HIGH hitch** will transfer weight behind the axles and cause the RV to fishtail.
- A **LOW hitch** will transfer additional weight to the hitch.

Your required hitch ball size is stamped on the hitch coupler. Depending on your floor plan, your travel trailer requires a hitch ball diameter of either 2" or 2 5/16."

If you have additional questions, consult with your dealer.

Sway Control (Included with the Dexter Tow Assist® System)

OEM or aftermarket sway control devices are available to reduce the sway produced by crosswinds, air displacement caused by other vehicles passing you in transit, incorrect weight distribution, excessive speed, the RV tires dropping onto the shoulder of the road, etc. The use of a sway control device will help to control the side-to-side movement and keep sway in check.

Suggestions for sway situations:

- Slowly ease your foot off the accelerator.
- Turn the steering wheel as little as possible.
 - Natural lag time reaction when counter-steering to correct sway *could possibly make it worse.*
- If the trailer is equipped with electric brakes, using the hand control will help to keep the vehicles aligned.
- As soon as possible, stop to determine the cause of the sway.
 - *REDUCE your speed until you are able to pull over.*
 - CHECK all equipment and load distribution.
 - If the problem cannot be solved immediately, CONTACT your dealer for a service appointment.

Weight Distributing System (Customer Supplied)

Aftermarket *Weight Distributing Hitch (WDH) Systems* provide a more stable tow vehicle/travel trailer towing combination. These systems will spread the weight evenly to distribute it to the front and rear tow vehicle axles and the trailer axle.

- **WARNING: Improper use of a Weight Distributing Hitch could cause damage to the A-Frame of your RV.**

Be certain your tow vehicle can carry the hitch weight.

Consult with your dealer to familiarize yourself with the operation and requirements of the weight distributing hitch system.

Travel Trailer Hitching Procedure

The following procedure will help assist you in securely hooking up your RV to your tow vehicle:

1. ALWAYS use wheel chocks to block the trailer wheels.
 - DO NOT lift the unit's wheels off the ground.
2. UNLOCK & OPEN the cover on top of the **BAL SS 5.1 Stabilizing System tongue jack**. Also see **page 66**.
3. CHECK that the **BAL SS 5.1 Stabilizing System** is hooked to 12-volt power and turned ON, *then*
 - PUSH the EXTEND control button on the tongue jack to raise the travel trailer tongue above the hitch ball.
4. OPEN the coupler latch on the travel trailer hitch.
5. BACK UP your tow vehicle into the proper position.
6. PUSH the tongue jack RETRACT button to lower the tongue jack coupler onto the tow vehicle hitch ball.
7. CLOSE the coupler latch after it is completely seated and install the safety pin.
8. INSTALL the (customer supplied) *Weight Distributing Bars (or Equalizers)* as directed by the OEM.
9. REMOVE locking pin and the tongue jack foot pad, *then* fully RETRACT.
10. CHECK that the stabilizer jacks are fully retracted.
11. ATTACH the breakaway switch cable to the tow vehicle.
12. ATTACH the safety chains.
13. CONNECT the 7-way wire harness from the travel trailer to your tow vehicle and secure in the travel position.
 - VERIFY the exterior lights are working correctly around the RV.
14. REMOVE the wheel chocks from the trailer wheels.

WARNING

BAL SS 5.1 Stabilizing System

- NEVER use the system as a lift for changing tires or working under the unit.
- KEEP people and pets clear of the unit while operating the system.
- ALWAYS chock the tires before disconnecting the unit from the tow vehicle and/or operating the system.
- NEVER lift the wheels of the RV off the ground.
- ALWAYS check that the RV is properly connected to the tow vehicle before fully retracting the tongue jack.
- VISUALLY CHECK that all jacks to ensure that they are fully retracted before towing the unit.
- FAILURE TO HEED any of these warnings may result in damage to the unit and tow vehicle and/or cause serious injury or death.



The power tongue jack's **RETRACT & EXTEND** buttons indicate the direction of the leg.

RETRACT - Lowers the RV.
EXTEND - Raises the RV.



 **WARNING**

Towing items behind RV or overloading the rear will void the warranty and may result in damage to the RV or add-on items, towing difficulties, property damage and/or personal injury.

 **WARNING**

NEVER allow anyone to go under the RV while it is being lifted and/or towed.

Towing the RV

Braking & Stopping Distance

Towing an RV greatly increases your stopping distance. Practice braking in a large parking lot (where it is permissible) to become familiar with your RV's stopping distance before driving in traffic.

- AVOID conditions that require excessive and prolonged use of your brakes. *Smooth starts* and *easing to a stop* will save wear and tear on your RV/tow vehicle combination.

When descending a long hill, drop into a lower gear (or a lower range, if you have automatic transmission). This allows your tow vehicle's engine and transmission to help control your speed which can extend brake life.

- Apply and release the brakes at short intervals to give them a chance to cool.
- Driving through deep water may get the brakes wet, increasing stopping distance or causing the vehicle to pull to one side.
- **DO NOT operate the vehicle if a difference in braking efficiency is noticeable.** Check the RV's brake operation in a safe area to be sure they have not been affected.

Weight and Clearance Limits

In order to obey all posted *Weight and Clearance Limits*, you **must** ALWAYS know the **Gross Weight** and **Total Height** of your RV/tow vehicle combination.

- ALWAYS include the roof air conditioners, TV antennas, and floodlights as they may cause clearance problems under some tunnels, canopies or hanging signs.
- Some bridges, older ones in particular, may not support the weight of your RV/tow vehicle combination.

Road Conditions

ALWAYS adjust your driving for road conditions.

- Slow way down, *then* release your brakes before crossing railroad tracks.
- Sudden acceleration or deceleration on wet or icy roads can cause skidding and loss of control.
- Slow down well in advance of any bumps or dips in the road to reduce jolting your RV/tow vehicle combination.
- Drive over any uneven surfaces *slowly* and make sure to have passed them *completely* before accelerating.

Passenger Safety

- **DO NOT allow anyone to ride inside as a passenger while your RV is in motion.**
- **This practice is *against the law* in several states.**

Turning Corners

While making a turn:

- The RV **does NOT** follow the path of your *Tow Vehicle*.
- The RV will make a TIGHTER turn than your *Tow Vehicle*.

You **must compensate** for this action by carefully pulling the tow vehicle out into the intersection further than you normally would so that the RV clears the curb (or any parked vehicles along the curb).

Passing

While towing an RV, it takes longer to reach highway speeds. Allow additional time to safely overtake and pass vehicles.

- Changing lanes in traffic also takes longer due to the extra length of your RV/tow vehicle combination.
- ALWAYS drive with caution and avoid situations that may require quickly changing your speed or your lane.

Backing Up

If there are no pull through sites at your camping destination, choose a level site and back in carefully. BEFORE you park, exit your tow vehicle, and inspect that site conditions are satisfactory.

- Check that you have plenty of vehicle clearance.
- Check that your path is free of obstacles.
(*low-hanging tree limbs, posts, large rocks*)
- Try to choose a site that is on the driver's side, so that you can easily see the rear of the RV.
- A site on the passenger side is more difficult, since you back into the site on your blind side.
- Position your tow vehicle and RV for backing into the site.
- Back up the RV slowly. Watch your tow vehicle mirrors and *Back Up Camera* (customer supplied) carefully to help you guide the RV into the site.
- Have another person outside the RV to assist you until the RV is parked in the desired position.

WARNING

- When making a turn, check the road clearance and be aware of others.
- Have someone help guide you out of a difficult parking space or traffic pattern.
- Swerves and sharp turns, especially at high speeds, could result in loss of control of the RV.



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



WARNING

DO NOT attempt to lift the RV with either the stabilizer jacks or the power tongue jack. These jacks are NOT designed to bear the total weight of the RV. Stabilizer jacks are only to help steady the trailer from movement.



WARNING

DO NOT use the stabilizer jacks for leveling on uneven ground or to change tires. NEVER use the jacks to elevate any wheel off the ground. Damage to the stabilizer jacks and RV frame can occur.



WARNING

DO NOT overextend or retract the power tongue jack or stabilizer jacks as that could cause damage which would not be warrantable.



WARNING

Both the power tongue jack and the stabilizer jacks must be fully retracted before moving or towing the RV to prevent damage.

Towing the RV, Continued

Parking

Once the RV is in your desired location:

1. Set the tow vehicle parking brake.
2. Turn OFF the ignition switch.
3. Go outside and block the RV wheels securely with wheel chocks.
 - *The wheel chocks can be wood blocks or purchased items as long as they prevent the RV from rolling.*

Leveling the RV

1. **ALWAYS check that you are parked on a mostly level surface, then**
2. **Disconnect your RV from the tow vehicle.**
 - All persons, pets and property MUST be clear of the RV while leveling is in progress.
 - Use a small level in the refrigerator, *and* on the countertop or floor to confirm the RV is level.

Leveling your RV is important

- To confirm the RV is level, use a small level to check the middle of the floor, the countertop, and the refrigerator.
- The slideout(s), refrigerator, and other appliances are designed to perform best when the RV is level.
- The RV must be level for the water system to drain properly.
- Sleeping and walking inside is more comfortable when the RV is level.

See the **Next Page**, *Travel Trailer Set Up*.

Stabilizer Jacks

The stabilizer jacks are located under the RV, attached to the frame. These jacks are designed *only* to stabilize the RV, and help prevent *bouncing* as occupants move around inside.

- **See instructions on page 157, Stabilizing System, BAL SS 5.1.**
 - **DO NOT use the jacks to lift the trailer off the ground.**
 - Place wooden blocks under the foot pads to prevent them from sinking into soft ground.

Travel Trailer Set Up

1. Position the RV as desired, *then*
 - Chock the tires to keep the RV from rolling.
 - Never lift the unit's wheels off the ground.
2. Unhook the *7-Way Wire Harness/Connector Plug*, safety chains, and breakaway switch cable.
3. Release the weight distributing bars if equipped. (customer supplied).
4. Disconnect your tow vehicle from the RV.
5. Check that the *Power Tongue Jack* is hooked to 12-volt power, *then*
 - Press the POWER button to activate the system.
6. Press EXTEND or RETRACT, and then **press** and **hold** the button corresponding to the jack or jacks you wish to actuate.
7. LEVEL the RV (*front-to-back*) with the power tongue jack.
8. After you have leveled your unit, EXTEND the stabilizer jacks to the ground.
 - **All Four (4) jacks must have about equal pressure.**
 - **Uneven pressure on the jacks can twist the unit,** causing doors and slideouts to bind and/or operate intermittently.
9. Always RETRACT the stabilizer jacks, BEFORE operating the tongue jack.
 - The tongue jack is the only jack that can be used for leveling.
 - All other jacks are for stabilizing only.
10. Pull away your tow vehicle.

Night Light Mode: With the system off, **press** and **hold** the POWER button until the tongue jack lights illuminate.

- Press POWER again to turn off.

Once the RV is stabilized, continue the RV set up connecting to the site facilities, extending the slideouts, etc., according to your personal preferences and needs. There is no particular order to set up procedures. With practice you will find the order that works best for you.

NOTICE

Ensure that the RV is level before operating the slideout room.

Water leaks and other problems could result if the slideout is operated without leveling the RV.

Stabilizing System, BAL SS 5.1

- **See WARNINGS listed page 61, Travel Trailer Hitching Procedure.**

Operating the Jacks

- Use traditional leveling blocks underneath your tires to level the unit side to side.
- Chock the tires. Never lift the unit's wheels off the ground.
- Press POWER to activate the system.
- Press EXTEND or RETRACT, and then **press** and **hold** the button corresponding to the jack or jacks you wish to actuate.
- Use the tongue jack to level front to back.
- After you have leveled your unit, extend the stabilizer jacks to the ground.
- Always retract the stabilizer jacks before operating the tongue jack.
- The tongue jack is the only jack that can be used for leveling. All other jacks are for stabilizing only.
- Night Light Mode: With the system off, **press** and **hold** the POWER button until the tongue jack lights illuminate. Press POWER again to turn OFF.



Manual Jack Override

- At the bottom of the tongue jack motor in the center, there is a round rubber plug. REMOVE the rubber plug to expose the 5/16" override hex (Fig. 1).
 - Using a drill with a 5/16" drive socket, rotate the motor to operate the tongue jack (Fig. 2).
 - The tongue jack may also be overridden by removing the plug to the right of the switch panel and inserting a 3/8" square drive to rotate the jack (Fig. 3).
- To override the stabilizer jacks, locate the 3/4" nut on the out-facing end of the stabilizer jack (Fig 4).
 - Use the handle provided, or a 3/4" socket or wrench to raise or lower the jacks.
 - **DO NOT USE POWER DRIVER. DAMAGE TO JACK OR MOTOR MAY OCCUR.**



For Care and Maintenance, See page 157.

Electrical Systems

Your Serenova Travel Trailer is equipped with two independent electrical systems. One system is 120-volt 60hz AC power, the other system is 12-volt DC power. The electrical equipment and associated circuitry are engineered into a dedicated system specific to your RV. All installations meet or exceed industry standards applicable on the date of manufacture.

- **A hazardous condition may result from changes or additions to the RV electrical system made after delivery.**
- **Adding fixed appliances or making unauthorized changes is NOT recommended.**
- **ONLY a certified electrical technician should perform service or modifications on the RV electrical system.**

*The **methods, components, and materials** used **MUST** be in compliance with current safety and code requirements. Please consult your dealer's service department for assistance.*

Electrical System Maintenance

- ALWAYS disconnect the negative 12-volt DC battery terminal and the shore power cord BEFORE working on the electrical system.
- ALWAYS turn OFF the power converter, BEFORE disconnecting the battery.

For more information on your RV's electrical system, see the component manuals in your Owner Information Package.

50-Amp Power Cord

The power cord (or *Shore Power Cord*) connects your RV to an external power receptacle. This heavy duty cord has a dual purpose. **When connected, it will:**

- **CARRY VOLTAGE & CURRENT** to your RV from the external power receptacle, *and*
- **GROUND** the electrical system of your RV through the external power receptacle.

BEFORE connecting your power cord, ALWAYS:

- TEST the external power receptacle or electrical box with a **Line Monitor/Outlet Tester** (customer supplied).
- **DO NOT connect the power cord if the Line Monitor indicates REVERSE POLARITY or an OPEN GROUND.**

WARNING

Use caution when using metal tools. If a tool makes contact with a battery terminal or the metal connected to it, a short circuit could occur which could cause personal injury, explosion or fire.

WARNING

The power cord **MUST** be fully extended when in use and **NOT** left coiled in the electrical compartment or on the ground.

If the power cord is left coiled, it may potentially create enough heat to melt its protective casing.



50 Amp Power Inlet

WARNING

- DO NOT hook up the power cord to any receptacle until you have verified proper polarity and grounding. Polarity indicators can be purchased in most electrical and hardware stores.
- DO NOT use any cheater plug, adapter or extension cord to reconfigure incoming AC power or break the continuity of the circuit connected to the grounding pin.
- DO NOT connect the power cord into an outlet that is not grounded, or adapt the power cord plug to connect it to a receptacle for which it is not designed.
- DO NOT remove the grounding pin to connect to a non-grounded receptacle. Removal of the ground pin disables an important safety feature designed to prevent electrocution and shock hazards.
- DO NOT connect the power cord to an extension cord. Use of an improper extension cord will cause overheating of the cord as well as potentially causing premature failure of the AC equipment.
- It is the *responsibility* of the electrical receptacle owner to ensure that it is properly wired and grounded.
- *Reverse Polarity and/or Improper Grounding* of your RV can cause personal injury or death.

50-Amp Power Cord, Continued

Connecting the power cord

1. Turn OFF the load center main 120-volt circuit breaker.
2. Carefully extend the entire length of the power cord from the electric cable hatch to the external power source.
3. Plug the power cord into the receptacle. Make sure that all of the power cord prongs are properly seated into the receptacle.
4. Return to your RV and turn ON the load center main circuit breaker.
5. To help prevent power surges from damaging the connected loads, please follow these instructions when hooking up to the external power source:
 - a. Unplug the shore power cord when the RV is left unattended. This may help limit potential damage in the event of a power surge.
 - b. Use care to prevent damaging the connection pins when connecting or disconnecting the power cord.
 - c. Reverse the *Connecting the power cord* steps (1-5) listed above, when you are ready to leave.
6. ALWAYS disconnect the power cord from the outlet by the plug; NEVER disconnect the plug by pulling the cord.

Power Cord Maintenance

- INSPECT your power cord *frequently* for Cuts, Cracks, and Worn Insulation.
- REPLACE the cord immediately if any of these conditions are found.

120-Volt AC System

Your RV is equipped with a **50 amp** electrical system . **It is important to know the system equipped on your RV.**

- The **50 amp** 120-volt 60hz AC electrical system is designed to operate on two (2) legs of 120-volt power at a maximum current flow of 50 amperes per leg.

Power to your 120-volt 60hz AC electrical system (50 amp) can be supplied by the 120-volt 60hz utilities found at RV campgrounds or by a generator. A campground's electrical service may occasionally experience high or low voltage.

- **Exposure to voltages higher or lower than 120-volts will damage or shorten the service life of the electrical system and appliances.**

The following electrical components (if so equipped) will operate **ONLY** when your RV is connected to shore power: 120-volt to 12-volt power converter, air conditioner, microwave oven, television(s), fireplace, and other appliances that plug into convenience electrical receptacles.

For recommendations on power-surge protection, consult your dealer.

120-Volt Circuit Breakers

The 120-volt AC circuit breakers are located in the main load center. They protect all of the 120-volt wiring and components. Each circuit is identified on a label inside the load center.

- An *overload* or *short circuit* will cause the breaker to *trip*, stopping the flow of electricity for the affected circuit.
- If a circuit breaker *trips*, turn OFF the appliance on that circuit. Allow some time for the circuit breaker to cool.
- **To RESET the circuit breaker**, flip the switch to the OFF position, then flip it back to the ON position.
- If a breaker immediately trips again or trips frequently, contact your dealer to diagnose and repair the problem.

Maintenance and replacement

Circuit breaker switches can wear out. Test the breakers annually, at the beginning of the camping season. Replace them as needed, during normal maintenance.

- **To TEST:** Flip each breaker switch to the OFF position, then back to the ON position.

For further information, contact your dealer.

WARNING

For 50 amp systems only:

Make certain the external power source that you connect the power cord to is a **50 amp NEMA 14-50 RV receptacle**, and NOT a 240-volt AC receptacle.

WARNING

Replacement circuit breakers must be of the same voltage, amperage rating and type. Never use a higher rated replacement circuit breaker; doing so may cause a fire by overheating the RV wiring.

CAUTION

Circuit breakers and fuses will not offer complete protection of the electrical system in the event of a voltage spike/power surge.

Converter

The Power Converter changes 120-volt AC power to usable 12-volt DC power when the shore power cord is connected to an external power source. A thermal breaker is built-in to the converter to protect it from overheating.

Overheating is usually caused by the converter operating above its maximum power output for an extended time period, or with too little air flow.

- To reduce converter heat, DO NOT run any unnecessary 12-volt lights/motors/appliances, *and*
- Keep the converter cooling fins and fan clear of obstructions.

Inspection and maintenance

If the 12-volt power converter is NOT working, or the auxiliary battery is not being charged:

1. Locate the converter fuse panel on one end of the converter.
2. Check the reverse polarity fuse or fuses.

The manufacturer's warranty will be void if the case has been removed. There are no customer serviceable parts inside.

For further information, contact your dealer.

GFCI Receptacle

Grounding is your personal protection from electrical shock. Each RV has a ground fault current interrupter (GFCI) engineered into the electrical system. This device has been designed to reduce the possible injury caused by electric shock. The GFCI will not protect against short circuits or circuit overloads.

- A *tripped* GFCI receptacle indicates that abnormally high 120-volt current flow (a ground fault) was detected through the electrical system grounding circuit.

A fault condition can be caused by faulty wire insulation, wet wiring inside an appliance, or faulty electrical equipment connected to the circuit, etc. All ground faults must be repaired before use of the RV.

Test all GFCI receptacles monthly

- **PUSH IN** the *TEST* button. This should **pop out** the *RESET* button, indicating the GFCI receptacle has been *tripped*. This will interrupt the 120-volt power.
- **PUSH IN** the *RESET* button. This should **restore** the 120-volt power.

Contact your dealer for assistance, if the RESET button does NOT restore 120-volt power or trips repeatedly.

12-Volt DC System

Many of your RV components including the light fixtures, water pump, motors and appliances run on 12-volt electricity.

- The **Converter** supplies 12-volt power when your RV is connected to external power. The converter will also charge the Auxiliary Battery in most situations.
- The **Auxiliary Battery** supplies 12-volt power when your RV is NOT connected to external power.
- The **Tow Vehicle Alternator** supplies 12-volt power when the *7-Way Wire Harness* is connected, and the tow vehicle engine is running.

The alternator runs the components needed for travel including, the brake lights, turn signals, brakes, running lights and the breakaway switch. In addition, the *7-Way Wire Harness* provides a common ground and a charge line to your auxiliary battery.

12-Volt DC Outlet (If So Equipped)

Your RV may include a 12-volt DC outlet (not applicable on all models). **ONLY** use this outlet for an appliance that runs on 12-volt DC power and consumes less than 60 watts (5 amps).

- **To prevent a short circuit, keep the 12-volt DC outlet free of any (metallic) foreign material.**



12-Volt Fuse Panel

The label inside the 12-volt fuse panel indicates the fuse sizes, positions and components powered. The fuse panel label should be kept permanently affixed to your RV.

- INSPECT all 12-volt fuses at the beginning of each camping season, and REPLACE as needed.
- The fuses may not offer complete protection of the RV electrical system in the event of a power surge or spike.

Replacing a fuse

- **Before** replacing a fuse, **always** TURN OFF or UNPLUG the component(s) it protects.
1. DISCONNECT the shore power cord.
 2. DISCONNECT the negative cable from the RV auxiliary battery.
 3. REMOVE the fuse panel cover to check fuses.
 4. PULL the fuse straight out of the fuse block.
 - *If the fuse is not blown, please contact your dealer to determine the cause of the problem.*
 5. ALWAYS replace with a new fuse of the same specified voltage, amperage rating and type in the original location.
 - NEVER use a *higher rated* replacement fuse.

Auxiliary Battery

The 12-volt DC electrical system is designed for use with a **Group 24** or **Group 27 deep cycle battery**.

- **Your RV has many individual 12-volt DC loads. When combined, the total load is higher than the converter can produce.**
- High demands for 12-volt power can be met by an *auxiliary battery* for limited periods of time.

Dry camping

When dry camping, it is recommended you consider the charge condition of the auxiliary battery AND plan your electrical usage accordingly.

- If the RV is drawing power solely from the auxiliary battery **without recharging**, it will become **depleted**.
- As the battery's charge becomes **lower**, it will also **discharge at a faster rate**.

For accuracy, test the auxiliary battery voltage using a volt-ohm meter. A fully charged auxiliary battery will read 12.7 volts DC and 1.265 specific gravity at 80°F (32°C).

The auxiliary battery is considered discharged at 11.8 volts, and dead at 11.65 volts. Permanent damage may occur when voltage drops below those levels. Typically, a deep cycle battery has an amp-hour rating of 75-100 amps.

If the furnace and refrigerator are operating simultaneously, approximately (12.0 + 3.0) 15.0 amps per hour are used. This does not include any 12-volt lights, water pump or any other 12-volt component.

In the above example, if the furnace and refrigerator operated constantly, a 75 amp-hour battery would become fully discharged in 5 hours ($75\text{ah} \div 15\text{a} = 5\text{h}$).

The RV's auxiliary battery should be installed in parallel with the battery in your tow vehicle. When the 7-way trailer plug is connected, *both* batteries power the RV.

- **It is very important NOT to discharge your tow vehicle battery below the level required to start the engine.**

To prevent this from occurring, disconnect the 7-way trailer plug or install a *Battery Isolator* (customer supplied). When the tow vehicle engine is operating with the RV connected, the tow vehicle charging system will charge both batteries.

Replacement and maintenance

Some equipment in your RV will draw small amounts of current even when turned OFF. To prevent the auxiliary battery from being discharged when your RV is not connected to shore line power, disconnect the auxiliary battery negative cable at the battery. During storage, it is important to check the voltage monthly and recharge the auxiliary battery as needed. If you remove the auxiliary battery from your RV, store it in a dry, cool area per the manufacturer's instructions.

When it is time to replace the auxiliary battery, replace it with a **Group 24 or Group 27 deep cycle battery ONLY.**

- ***DO NOT reverse the positive and negative battery cables (doing so will blow the reverse polarity fuse(s) that protect the converter).***

Contact the battery manufacturer for further information.



Battery Disconnect

Battery Disconnect Switch

The *Battery Disconnect Switch* (see photo) is located on the Universal Docking Station. **At times when auxiliary power will NOT be needed:**

- TURN the *Battery Disconnect Switch* to the OFF position and REMOVE key.
- The Power Tongue Jack and all 12-Volt safety items will remain operational.

When you are ready to use your RV's interior features:

- REPLACE key, and TURN the *Battery Disconnect Switch* to the ON position.

If the RV will be in STORAGE: Also DISCONNECT the battery cables from the auxiliary battery terminals. See **page 147**, *Winterizing/RV Storage Preparation #12*.

Calculating Electrical Load

While connected to external power and using appliances, the 120-volt electrical system can ONLY run a maximum of 100 amps.

- Added together, the amperage of each appliance and component running at the same time, **must NOT exceed 100 amps.**
- If you overload the RV and/or campground electrical system, a circuit breaker trip may occur.

To calculate the amperage rating for each individual appliance, divide the *wattage* by the *voltage* (both should be listed on the appliance). **For example:**

- **1200 watts divided by 120 volts equals 10 amps.**
See the **Next Page**, *Approximate Electrical Load Ratings*.

Replacing Light Bulbs (Customer Supplied)

- BEFORE replacing a bulb, turn OFF the light switch.
- **Using the wrong bulb can overload the lamp circuit and overheat the fixture, creating a FIRE HAZARD.**
 - CHECK that your replacement bulbs match the type, wattage and voltage listed on the lamp fixture.

Approximate Electrical Load Ratings

- Use the actual amperage of the appliance when possible. ($\text{Watts} \div \text{Volts}$).

Calculating Electrical Load

While connected to external power and using appliances: the 120-volt Electrical System can ONLY run a maximum of 100 amps.

- Added together, the amperage of each appliance and component running at the same time, **must NOT exceed 100 amps.**
- If you overload the RV and/or campground electrical system, a circuit breaker trip may occur.

To calculate the amperage rating for each individual appliance, divide the *wattage* by the *voltage* (both should be listed on the appliance).

- **For example: 1200 watts divided by 120 volts equals 10 amps.**
- See *Approximate Electrical Load Ratings*, listed below:

12 Volt System	
Aisle Lights	0.5 amps
Baggage Compartment Lights	0.5 amps
Decorative Wall Lights	0.5 amps
Dinette Light	0.5-1 amps
Exterior Entertainment Center	1-3 amps
3" LED Puck Lights (Each)	0.22 amps
Furnace	8-10 amps
Generator Start	95.0 amps *
Illuminated Switch	.125 amps
Inverter	Variable
Leveling System	95.0 amps *
LP Detector	0.125 amps
Map Light	1.5 amps
Porch Light	1.5 amps
Power Awning	10.0 amps
Power Vent	5.0 amps
Refrigerator	8-10 amps
Shower Light	0.22 amps
Step Cover	10.0 amps
TV Plate / Antenna Booster	1.0 amps
Vanity Light	0.22 amps
Vent Fan	0.5-4.3 amps
Water Heater	6.0 amps
Water Pump	3-5 amps
* Momentary load	

120 Volt System	
Air Conditioner	14-18 amps
Coffee Maker	6-12 amps
Converter (Each)	8-11 amps
Curling Iron or Hair Dryer	10-14 amps
DVD / Blu-ray Disc Player	3 amps
Microwave	12 amps
Refrigerator	6 amps
Satellite Receiver	2 amps
TV	2-4 amps
Vacuum Cleaner	8 amps
Washer / Dryer	12 amps
Water Heater	12 amps



Solar Docking Port

! WARNING

Observe correct polarity at all times

Reverse polarity of the battery terminals will cause the controller to give a warning tone. Reverse connection of the array will not cause an alarm but the controller will not function.

Failure to correct this fault could damage the controller.



SCAN the QR Code, above, with the camera on your smartphone or tablet to download the **GoPower! 30 Amp PWM Solar Controller manual.**

Inverter Prep (customer supplied)

Serenova Travel Trailers are pre-wired to add up to a 3,000W Inverter (customer supplied) to the solar system.

- *Please contact your Grand Design RV Dealer or Grand Design RV Customer Service for more information and ordering a compatible inverter.*

Solar Docking Port

The *Solar Docking Port* is standard equipment, installed on the roof of your RV. It is designed for use with either an OEM or customer supplied *Solar Power Charging System*.

Solar Power Charging System

The *Solar Power Charging System* efficiently charges your RV battery by converting the energy from a roof mounted solar panel to 12-Volt DC.

- Once your battery is fully charged, the *Solar Charge Controller* also protects it from overcharging by limiting the current flow from your solar array.

30 Amp PWM Solar Controller



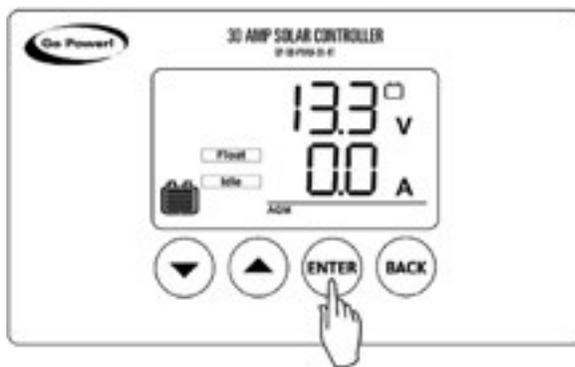
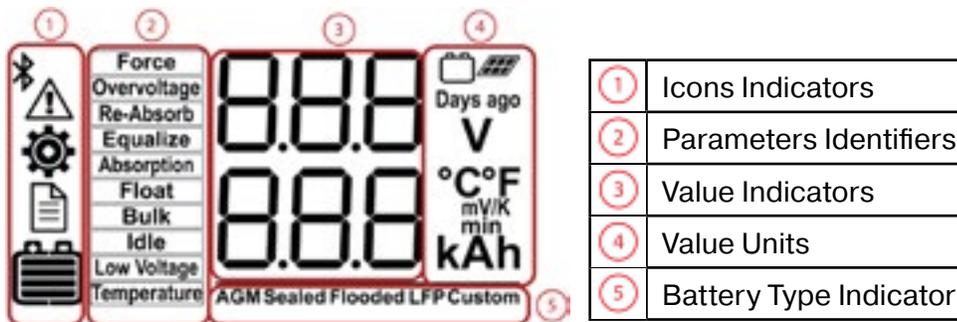
Please read and understand the Go Power! manufacturer's manuals for the *30 Amp PWM Solar Controller & Solar Panel* BEFORE using the *Solar Power Charging System*.

- For a complete list of all functionalities and instructions in the Go Power! Connect app, visit
 - gpelectric.com/support/
- Follow all safety alerts, warnings, and instructions when using the *Solar Power Charging System*.

Operating Instructions

Menu Operation:

- **IMPORTANT: You must set the "battery type" on the GP-SB-PWM before you begin to use the controller**
 - The default battery setting is for AGM batteries.

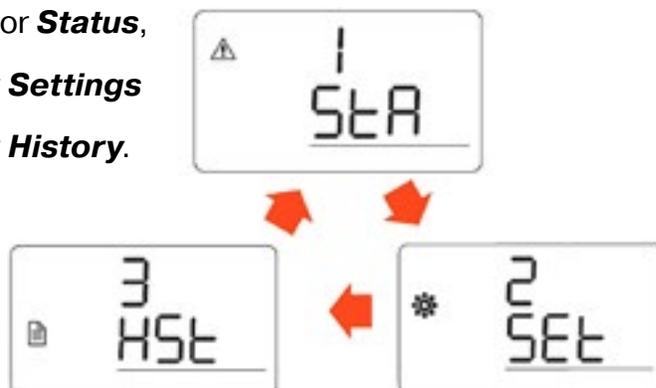


Three menus are implemented in the display: **Status**, **Settings**, and **History**. At power up, the controller turns ON within the status menu.

- The different menus can then be accessed by pressing the ENTER key as shown (*above*).

This leads to **Status Menu** number one (1).

- PRESS the (UP) and (DOWN) arrow buttons to navigate the menus as shown below:
- Menu 1 is for **Status**,
- Menu 2 for **Settings**
- Menu 3 for **History**.



! WARNING

When a ground fault is indicated, battery terminals and connected circuits might be ungrounded and hazardous.

! WARNING

This unit is not provided with a GFDI device. This charge controller **must** be used with an external GFDI device as required by Article 690 of the National Electric Code for the installation location if required.

NOTICE

When the PV voltage exceeds the maximum PV open circuit voltage range, continuous operation may cause damage to the controller. Any damage caused by the user's improper operation will VOID warranty.

Please read the entire manufacturer's owner's manual for detailed operating instructions and safety warnings.

WARNING

When the photovoltaic (solar) array is exposed to light, it supplies a DC voltage to this equipment.

NOTE: In addition to the charge controller settings, you will be able to SET the **temperature unit, reboot, force float & absorption**, and RESET the “Ah” history.

If you need to reset the controller to its factory settings it is located at the bottom of the APP settings page.

For custom batteries, you will be able to set custom parameters to ensure the proper custom battery profile and **float, equalization** and **absorption** voltages are optimal.

See the next page.

30 Amp PWM Solar Controller (If So Equipped), Continued

Bluetooth® Wireless Technology

NOTE: This section is for the **GP-SB-PWM-30-BT** Controller only!

The GP-SB-PWM-30BT comes with Bluetooth® Low Energy wireless technology for live status monitoring and settings configuration on mobile devices. It works together with the Go Power! Connect App, available for both Android and iOS devices.

DOWNLOAD and INSTALL the **Go Power! Connect** app.



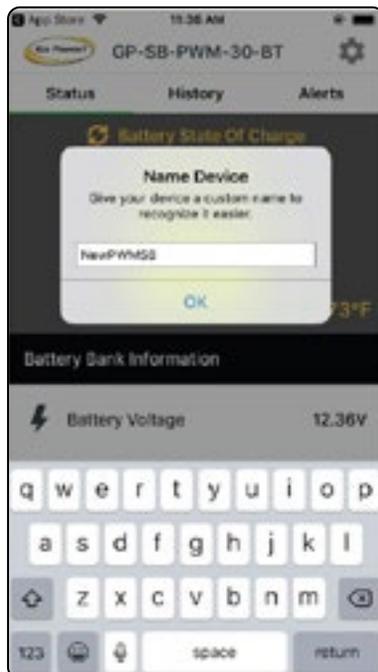
- App is available in the App Store® for iOS® devices and in the Google Play® store for Android® devices.

Pairing:

When connecting for the first time, pairing between the charge controller and the mobile device is required. Also ensure your mobile device’s Bluetooth® communication function is enabled.

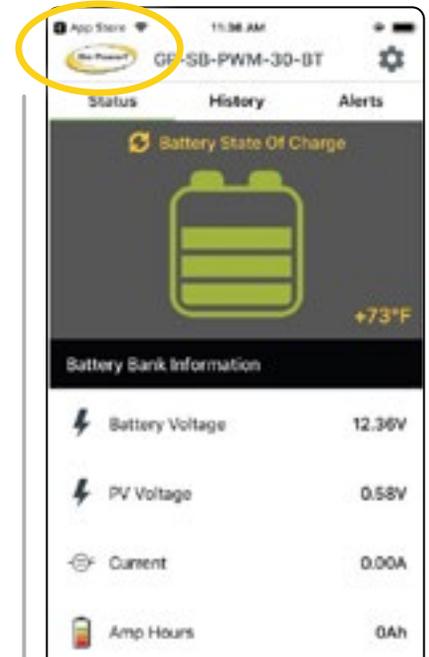
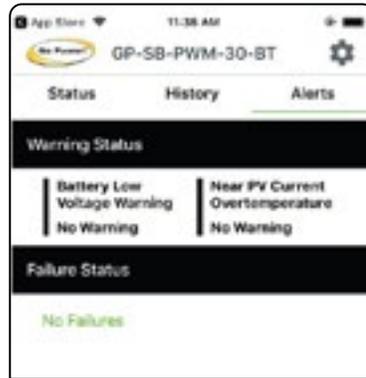
- You will see the Bluetooth® symbol present on your status bar.
- If so, OPEN the **Go Power! Connect** app, and the Main page will prompt you to select devices.

Once the solar controller is powered up, please select the charge controller in the *Device Selection* main page of the **Go Power! Connect** app. The App will prompt you to name the device for reconnection next time the app is used. 16.2 APP USAGE.



App Usage:

Upon initial connection you will load into the charge controller’s main status screen. You will be able to see the SoC, Battery Type, Voltage, Current of the controller. In addition to the main screen, there are two additional tabs “History & Alerts” to track the Ah usage and any important faults/alerts that may occur.

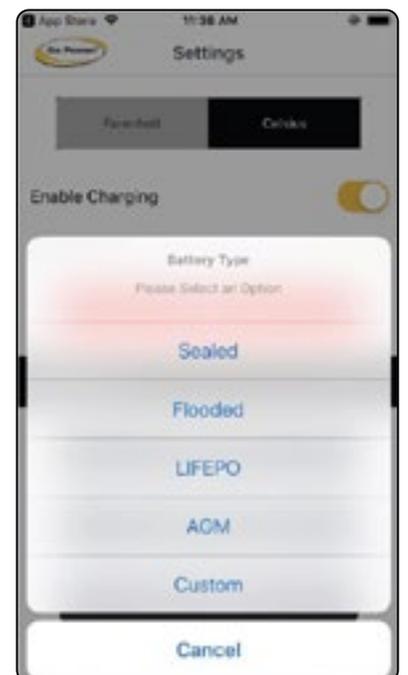


Important, please disconnect from the controller when you are done using the app. The Disconnection process can be activated by pressing the **Go Power!** Logo located at the top left of the app or on the *Status* page, SCROLL to the very bottom.

For a complete list of all functionalities & instructions in the **Go Power! Connect** app, visit: gpelectric.com/support/

App Settings:

In the App settings you will be able to set the battery type the solar controller is charging. The following batteries are supported below:



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Plumbing Systems

There are two separate water systems equipped on your RV, the *Fresh Water System* and the *Waste Water System*.

- The **Fresh Water System** consists of the *Fresh Water Holding Tank, Fresh Water Connections, Water Heater, Water Pump, Faucets, Shower/Tub, Outside Spray Port*, and if so equipped, a *Water Purification System*.
- The **Waste Water System** consists of the *Grey Water (waste water) Holding Tank, Black Water (sewage) Holding Tank, Drains and Toilet*.

BEFORE each trip or vehicle storage, and as part of normal maintenance, inspect the following for leaks:

- ALL fittings on BOTH water systems.
- ALL faucet and sink connections (including drain baskets or filters).
- ALL water pump and water heater connections.
- **At the end of each trip, ALWAYS drain your fresh water system completely.**

Fresh Water System - First Use

Your new RV may have been winterized, as indicated by temporary labels located in the universal docking station.

- **BEFORE the first use**, the system should be **Sanitized**, even if it has NOT been **Winterized**.
- **Sanitizing** the fresh water system will kill all bacteria and organisms that can contaminate your water supply.

Small amounts of contaminants and minerals are found in ALL water. They can sometimes cause your fresh water to have an odor. Usually, untreated well water is the source of water system odors.

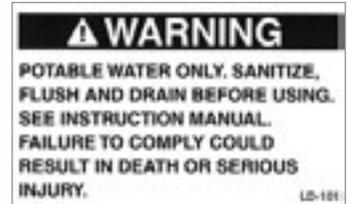
See **page 96**, *Sanitizing the Fresh Water System*.

WARNING

DO NOT drink water deemed microbiologically unsafe or of unknown quality.



DO NOT remove the following label from your RV.



Typical winterization label.





SCAN the QR Code, above, with the camera on your smartphone or tablet to download the full **Compass Connect** manual.



Monitor Panel



Command Center

Grand Design Compass Connect® App

The *Grand Design Compass Connect*® application displays the fill levels of your fresh water, grey water, and black water tanks on your smart phone or tablet.

- Please read the *Compass Connect*® manual found in your *Owner Information Package* before downloading and using the *Grand Design Compass Connect*® app.

Monitor Panel

The monitor panel is found on the interior Command Center. It displays the fill levels of your fresh water, grey water, and black water holding tanks. It also shows the voltage of your auxiliary battery. Each holding tank is equipped with a sensor to instantly relay the fill level to the LED display. *See photo (left).*

The monitor panel operates on 12-volt DC power supplied by either the converter or auxiliary battery. No power is drawn from the battery unless a button is pushed. Fuses for the monitor panel are located in the load center.

Water pump switch

When the water pump switch is turned ON, the water pump runs until 45 pounds of pressure has been achieved.

- *See Photo on the **facing page**.*
- Turn OFF the water pump switch when water is not in use.

Water heater controller

The tankless water heater is operated by a wall controller located in the bathroom, NOT from the Command Center.

- *See **page 86**, Water Heater, Furrion Tankless.*

12-Volt Water Pump

Once activated, the water pump (*or on-demand pump*) will self-prime, and provide water. The water pump continues to run until approximately 45 lbs. of pressure is achieved and shut off. The water pump will automatically restart when pressure drops. Some cycling may occur, depending on the volume of water being released. The water pump has a built-in check valve to prevent water from back flowing.

Water pump filter (if so equipped) is a screen filter located on the inlet side. This reusable screen must be cleaned periodically.

Fresh Water Holding Tank

The fresh water tank is pressure filled using the fresh water inlet. Plastic overflow tubes are plumbed into the fresh water holding tank to allow water to flow out of the water tank. Occasionally, you may see water coming from the overflow tubes (located underneath the RV) when the fresh water holding tank is filled. This is normal, and is caused by external circumstances, including the RV being parked on an incline, or the motion caused by starting or stopping the RV during travel.

- DO NOT cap, block or modify the fresh water tank overflow tubes in any way.
- If the overflow tubes are obstructed, enough water pressure can build up during the filling process to damage the plumbing system.



Water Pump On/Off

NOTICE

**BE CAREFUL
not to overfill the fresh
water holding tank.**

This can pressurize the tank, causing leakage & water damage, and also void your warranty.

DO NOT leave the tank unattended while filling.

NOTICE

Not using a water pressure regulator when using city water may cause the o-rings to fail. To prevent damage to the plumbing system or components when using the city water connection, a water pressure regulator rated for 40 lbs. is recommended.



City Water Inlet

NOTICE

The fresh water connection should be unplugged (i.e., the non-toxic drinking water hose disconnected) when the RV is left unattended for any amount of time.

If something would happen to the water system, this may help limit water damage to a smaller area.



DO NOT remove the following label from your RV.

WARNING
 POTABLE WATER ONLY. SANITIZE, FLUSH AND DRAIN BEFORE USING. SEE INSTRUCTION MANUAL. FAILURE TO COMPLY COULD RESULT IN DEATH OR SERIOUS INJURY.

LS-101

Water Pressure Regulator (Customer Supplied)

In some RV parks (especially in mountain regions), excessive pressure from water supply systems may be encountered.

- A *Water Pressure Regulator* (available for purchase from your RV dealer) will help to protect your plumbing system against damage from a high pressure water supply.

Fresh Water Connections

Use the *City Water Fill* to fill your fresh water tank anywhere there is access to an external, pressurized potable water source.

To use the city water fill:

1. If needed, sanitize the RV water system
 - See **page 96**, *Sanitizing the Fresh Water System*.
2. Attach a non-toxic drinking water hose to the city water inlet.
3. Adjust the *City Water Control Handle* (blue lever):
 - **Select CITY WATER or FRESH TANK FILL BEFORE turning on the water supply.**
 - **To prevent harm to the valve, when water pressure is turned on, DO NOT adjust the City Water Control Handle.**
 - a. To fill the fresh water tank for use while dry camping, turn the city water control handle to "TANK FILL" as shown below:



- b. For normal city water use at a campground, TURN the city water control handle to "CITY" as shown below:



4. Turn ON the water at the water source.
5. Enter the RV and open the cold water supply faucets to bleed air from the water lines. When the water lines are nearly full, you may experience some *air pockets*. Allow them to escape before closing the cold water supply faucets.
6. The supply lines and faucets will fill, followed by the water heater.

To disconnect the city water fill

1. Shut OFF the water at the water source.
2. Disconnect the non-toxic drinking water hose.

Dry camping

- Fill the *Fresh Water Tank* BEFORE camping.
- Turn ON the *Water Pump Switch* to use the water system.



SCAN the QR Code, above, with the camera on your smartphone or tablet to download the **Furrion Tankless Water Heater Manual.**



Water Heater Wall Controller

⚠ DANGER

Suffocation or Fire Hazard

- Exhaust gases are hot and contain carbon monoxide, **do not** breathe or obstruct the exhaust gases.
- Failure to follow this instruction will lead to serious injury, property damage or death.

Water Heater, Furrion Tankless

It is important to know which type of Water Heater is installed in your RV. Read all safety and operating information provided both here and in the manufacturer’s manual before using the water heater. Based on the hot water demand, the tankless water heater will heat incoming cold water to a desired output temperature by monitoring key sensors to regulate the thermal energy released over a large heat exchanger. This creates a more useful and energy efficient heating system versus the conventional tank water heater that wastes fuel during re-heat cycles and is limited on volume output.

Controller Operation

Perform a Functional Test of the water heater each time the RV and water system is setup for use.

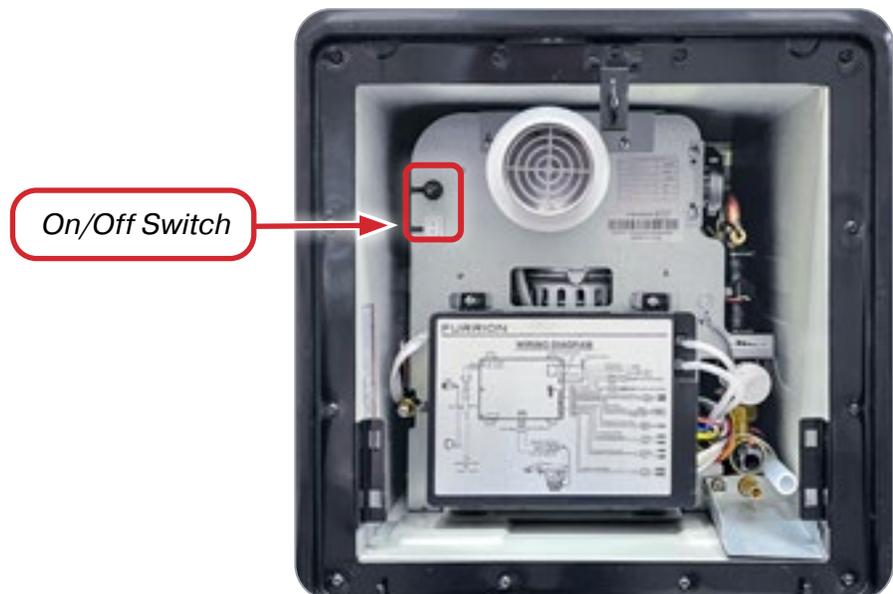
- Refer to the “Functional Test” process in the OEM manual found in your Owner Information Package.

Use the wall controller to adjust Water Heater settings. See photo, left.

1. Touch power button  to turn the power ON/OFF. The Furrion logo on the panel will be illuminated and display the current temperature setting.

NOTE: The micro processor is always ON. It draws approximately 0.25 AMPS, but is advisable to turn OFF when not in use.

2. Press “°F/°C” button to toggle temperature display between Fahrenheit and Celsius. This will light an LED indicator.
3. Touch the  or  button to adjust the temperature to your desired settings. The wall controller settings are from 95°F (35°C) to 124°F (51°C).



Inside the Exterior Door Furrion Tankless Water Heater

The temperature can be selected to operate in two different methods:

Method 1:

Point of use mixing: Set the controller temperature to a desired output temperature, typically elevated above comfortable bathing temperatures, i.e., 115°F (46°C). Turn ON the hot water, once hot, add cold water to achieve desired temperature.

Method 2:

Single point use: Set the controller temperature to a desired output temperature for the faucet you want to use, typically set to the desired bathing temperature, i.e., 100°F. The unit will maintain the set temperature by use of the hot water faucet only, no need to mix cold water.

4. Turn on the water faucet(s) and use as desired. The water temperature exiting the appliance (not faucet) will display.

Safe Operation

Consider the following points for safe use of the appliance:

- Install a RV water regulator to the inlet of the coach, and operate between (35-70 PSI).
- The factory default water temperature setting is 115°F (46°C).
- There may be a variation between the temperature delivered from the appliance and the temperature at the faucet due to water conditions between seasons like hot summer or the length of pipe from the appliance.
- Always check the water temperature, in reference to the chart below, by the display (step 3/4) and hand touch before bathing or with other hot water uses.

Temperature °F (°C)	Time before skin becomes scalded
155°F (68°C)	1 Second
148°F (64°C)	2 Seconds
140°F (60°C)	5 Seconds
133°F (56°C)	15 Seconds
127°F (52°C)	1 Minute
124°F (51°C)	3 Minutes
120°F (48°C)	5 Minutes
100°F (37°C)	Safe Bathing Temperature

Source: Moritz, A.R. / Herriques, F.C.: Studies of thermal injuries: the relative importance of time and surface temperature in causation of cutaneous burns A. J. Pathol, 1947; 23: 695 - 720.

WARNING

If the information in the manufacturer instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

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

WHAT TO DO IF YOU SMELL GAS:

- Evacuate all persons from vehicle.
- Shut off gas supply at gas container or source.
- DO NOT touch any electrical switch, or use any phone or radio in vehicle.
- DO NOT start vehicle's engine or electric generator.
- Contact nearest gas supplier or certified service technician for repairs.
- If you cannot reach a gas supplier or certified service technician, contact the nearest fire department.
- DO NOT turn on gas supply until gas leak(s) has been repaired.
- Installation and service must be performed by a certified installer, service agency or the gas supplier.

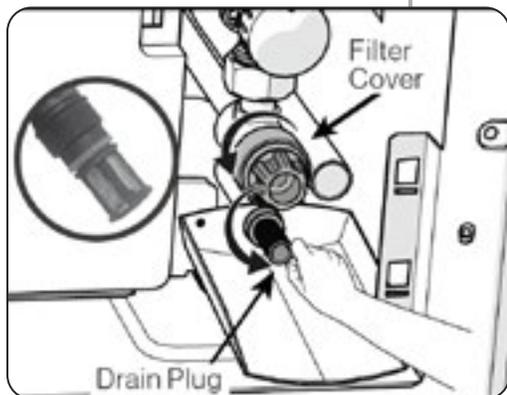
WARNING

Both automotive antifreeze (ethylene glycol) and windshield washer anti-freeze (methanol) are poisonous.

NEVER use these products in your fresh water system. They are harmful and may be fatal if swallowed.



Air Compressor Hose with Pressure Gauge



Before you begin Winterizing:

If you have installed an aftermarket Water Filter, make sure that it is set to the **bypass** position.

Water Heater, Furrion Tankless, Continued

Winterizing the Furrion Tankless Water Heater & Plumbing System:

Important: Also see page 97, Winterization Valve.

Preparing your RV for storage is very important in climates that experience cold weather. Follow the steps listed below at the end of the camping season:

- ALWAYS winterize the fresh water system of your RV BEFORE exposure to temperatures at or below 32°F (0°C).
 - *Damage to the water supply lines or water heater due to freezing is not covered under warranty.*
- **Winterize with RV Antifreeze ONLY**, no other products should ever be added to your fresh water system.
 - Make sure to have enough RV antifreeze to winterize all fresh water lines. *Several gallons may be required.*
- **BEFORE Winterizing, the Black Water, Grey Water & Fresh Water plumbing systems MUST all be emptied.**
 - **See page 102 & page 95.**

Supplement the following important water heater instructions when completing any winterizing steps:

Drain & Blow Out Water Heater Lines:

1. LEVEL the RV.
2. CLOSE all faucets & low point drains.
3. REMOVE the *Water Heater Drain Plug* and the *Filter Cover*. See the Diagram, left.
4. APPLY **no more than 30 PSI** of air to the *City Water Connection* at the Universal Docking Station.
 - After water stops draining from the Water Heater, SHUT OFF air.

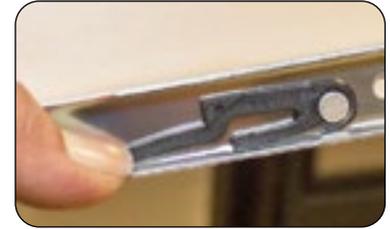
Adding RV Antifreeze to the Tankless Water Heater:

- **Before you begin, TURN OFF the Water Heater at the outside ON/OFF switch.**
- 5. REINSTALL the drain plug and filter cover.
- 6. ACCESS your Water Pump. (*Location varies by floorplan*)
 - The **Winterize Valve & Suction Line** are found on the intake side of pump.
 - a. **If pump is located under the Dinette Bench:** REMOVE cushions and LIFT seat panel.

- b. **If pump is located behind the Universal Docking Station:** UNSCREW & REMOVE the access panel located in your pass-through compartment.
- c. **If pump is located behind the Kitchen Drawers:** REMOVE the three drawers from the base cabinet:
 - i. PULL OUT the drawer until it stops.
 - ii. LOCATE the plastic drawer release clips on the right and left sides of the drawer, *then*
 - iii. *At the same time*, gently PUSH and HOLD down both plastic drawer release clips.
 - iv. Continue to PULL the drawer towards you and remove it from the drawer guides.
 - v. REPEAT **steps (i - iv)** to remove the remaining kitchen drawers.
7. REMOVE the re-usable cap from the *Suction Line*. (SAVE the cap for step 14.)
8. PLACE the end of the *Suction Line* into a container of RV antifreeze.
9. TURN the *Winterize Valve* to the OPEN position.
 - As shown on **page 97**.
10. Turn ON the *12-volt Water Pump*.
11. OPEN the ***hot** water line at each faucet. (*Kitchen, Lavatory, Shower, & Outside Faucet/Spray Port*)
 - CLOSE each ***hot** water line faucet when RV antifreeze begins to flow continuously.
12. REPEAT **Step 10** with the ***cold** water lines on all faucets. It is also important to run RV antifreeze through the *Sink/Shower Drains, Toilet, and outside Spray Port*.
13. Turn OFF the *12-volt Water Pump*.

When you are done adding RV antifreeze:

14. REMOVE the *Suction Line* from the container of RV antifreeze.
15. REPLACE the cap on the end of *Suction Line*.
16. BLOW OUT the black tank flush line at the outside connection with compressed air (max 70 PSI).
17. *To prevent staining*, CLEAN any RV antifreeze from the sinks, shower (or tub), and toilet using a soft, dry cloth.
18. OPEN then CLOSE kitchen hot and cold water faucets to release pressure in water lines.



Drawer Release Clips



It is important for you to read all instructions and understand each step *before* starting the winterization process.

- It may be easier to winterize the RV with a second person to assist you.

If you still have questions or concerns, contact your dealer for assistance.

NOTICE

**DO NOT USE
YOUR WATER HEATER
WHILE THE SYSTEM
IS WINTERIZED.**

Heating when filled with antifreeze (or while drained) may cause unwarrantable damage to the water heater and/or other components of the plumbing system.

Water Heater, Furrion Tankless, Continued

Next Season:

- Thoroughly FLUSH the water heater and system with clean drinking water through the hot and cold side before using.
- FILL water heater at *City Water Connection* & DRAIN the water heater several times.
- SANITIZE the water system per the recommendations of your coach manufacturer. See **page 96**.



Water Control Valve

The Water Heater is equipped with a water flow control valve, set from the factory at MAX flow. The valve will reduce the water flow and capacity through the water heater to improve water heating performance. Under extreme conditions, it may be necessary to adjust the valve accordingly:

- Cold water inlet conditions approximately less than 45°F (7°C)
- Higher water inlet pressures > 65 PSI.
To operate (*Fig. 30*):
 - REDUCE water flow: Rotate knob **clockwise** until a solid stop.
 - INCREASE water flow: Rotate knob **counter-clockwise** until a solid stop.

High Altitude Use

This appliance can be used at high altitude and has been tested up to 4500 ft. For prolonged use at higher altitudes please contact support@furrion.com

Antifreeze Function (*FWH09AFA models only*)

- The water heater can be used in freezing conditions, by operating a burner sequence program to keep the water liquid. This function turns ON automatically when water in the appliance falls below 43°F (6°C), then automatically shuts OFF when it is warmed.
- **During freezing temperatures**, it will likely be necessary to manually adjust the *Water Control Valve* to the "min" setting.
- If the RV is to be stored, with no use, the water heater **must be winterized** appropriately per the instructions starting on **page 88**.
- The freeze protection system only protects the water heater appliance from freezing and will NOT prevent freezing of the water system in the coach. Ensure the coach is properly insulated and protected from freezing conditions.
- It is normal for the water heater to operate the burner system at different frequencies and duration for this mode.

⚠ CAUTION

**PRODUCT DAMAGE
DUE TO FROST
CONDITION ❄**

**In frost conditions,
ambient temperatures
below 39°F (4°C), there
is a risk that water in
pipes, faucets and
appliance could freeze.**

**This can cause
considerable damage.**

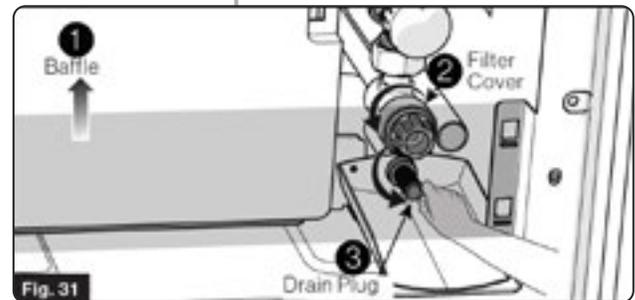
NOTE: The ANTIFREEZE function will NOT operate if any of the following are turned OFF:

- Water Heater Appliance
- 12V+ house electric
- Gas Supply

Storage and Transit

Anytime the RV is not intended to be used, it is considered to be in storage or transit. To prepare the water heater, follow the below steps:

1. Turn off gas supply.
2. Turn off water heater main switch.
3. Drain water out of the system and water heater by removing the filter cover and drain plug (Fig. 31).
4. If freezing conditions could occur, then the water heater **must be winterized** following the instructions beginning on **page 88**.



Routine Inspection

Routine inspection is critical for maintaining proper operation of your appliance. Unless specified, review the following items yearly or before each season:

1. Inspect the gas system and installation every two years, or otherwise specified by your RV coach manufacturer, by certified personnel.
2. Inspect for cracks, separation, peeling of seals to the RV wall. Remove and re-seal as necessary (caulking or tape) between the side wall and the door of the water heater and ensure that the unit is solidly mounted to the vehicle.
3. Verify that the air inlet openings (louvers) are completely open and clear of any debris (*including mud, leaves, twigs, insects, etc.*). Remove all obstructions to allow full air flow.
4. Insects, including wasps and spiders, can build nests in the exhaust tube outlet which will affect the performance of the unit. Inspect the flue outlet tube to make sure that it is unobstructed and that the screen is clean. If debris or insects are present, clean and vacuum to remove any remaining debris. **While the Water Heater is in use: DO NOT cover the outside vent with any type of after-market screen. This will void the warranty.**
5. Open the door and verify that no debris or extraneous combustible materials are present anywhere (especially in the area of the burner and the gas controls). Remove any item present and wipe clean the bottom of the housing.

CAUTION

Always wear protective gear such as gloves, eyewear and clothing to avoid injuries during installation and servicing of the product.

WARNING

Burn or Scald Hazard

- NEVER perform work while the water heater is operating.
- NEVER perform work without turning the Electrical and LP gas supply off.
- NEVER perform work when the appliance is hot.
- NEVER actuate the pressure relief valve as long as the appliance is still hot.
- NEVER actuate the Drain Plug as long as the appliance is under water pressure and/or is still hot.

Furrion Tankless Water Heater, Continued

! WARNING

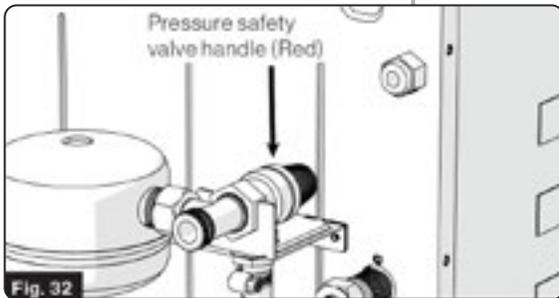
Burn or Scald Hazard

- Never actuate the pressure relief valve while the appliance is in operation.
- Never tamper with the pressure relief valve.

6. Inspect the interior surface of the housing for any cracks or corroded areas that could allow penetration of gases into or out of the interior of the vehicle.
 - Check especially around the hot water, cold water, gas and electrical connections.

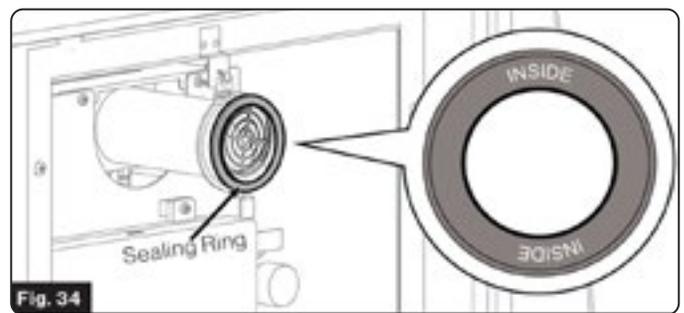
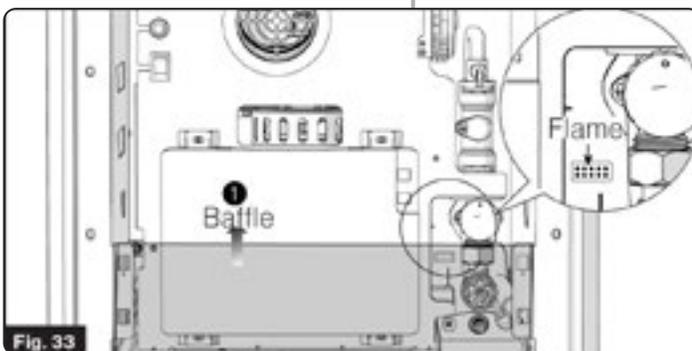
NOTE: If damages found, please contact a certified technician to repair or contact Furrion customer service.

7. Check that all wire connections are firmly in place and there are no signs of chafing or cracks on the insulation. Verify that the spark ignition cable between the Control Board and the igniter is securely in place and not shorted to any metal component.



8. Inspect the pressure safety valve to ensure it has not been leaking (no water residue). See "Pressure Safety Valve Maintenance" for further inspection (Fig. 32).
9. Inspect/clean/replace water inlet filter as necessary, see "Filter Cleaning" section.

10. Turn on the power to the water heater and open a hot water faucet to inspect the flame of the burner. The flame should be of the normal bluish appearance that indicates proper combustion. This can be accomplished by removing the water heater door and baffle to observe the flames by looking at the burner under the edge of the heat exchanger (Fig. 33).



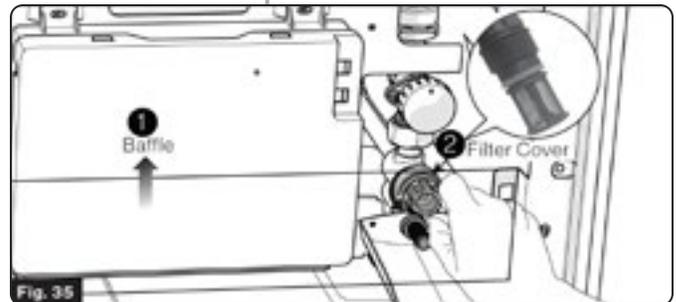
11. A sealing ring is assembled on the chimney (Fig. 34). Inspect to make sure the seal does not have any cracks or breaks, and that it is in good condition. Contact Furrion for replacement.

NOTE: When installing the seal, make sure that the words "INSIDE" are facing inward.

Filter Cleaning

There is a filter screen on the Water Heater inlet water line connection. The filter screen needs to be cleaned periodically to prevent blockages from forming. Follow steps below to clean the filter (*Fig. 35*) :

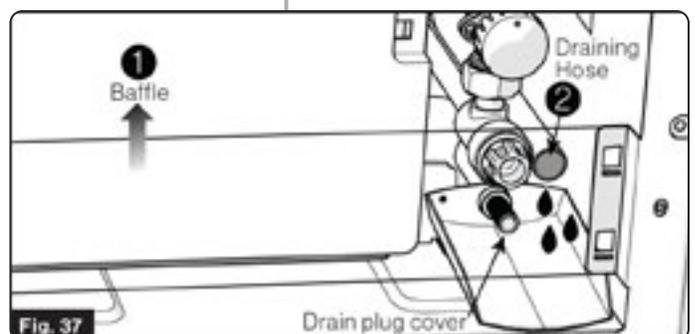
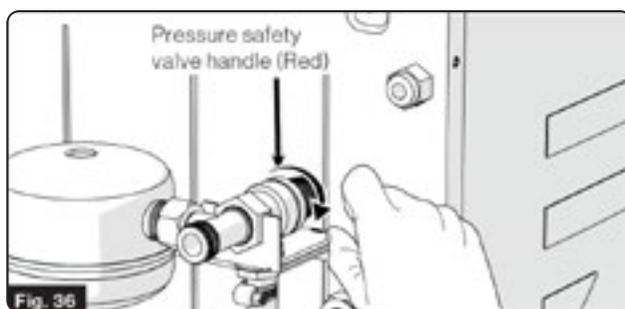
1. OPEN the door of the Water Heater, remove the baffle.
2. UNSCREW the filter cover by hand or a proper tool **counter-clockwise**.
3. CLEAN the screen filter by flushing any debris accumulated.



Pressure Safety Valve Maintenance

1. The unit is equipped with a water pressure safety valve. The pressure safety valve needs to operate once each year to ensure this safety device is effective.
2. The pressure relief valve is a safety component and must not be removed for any reason other than replacement. **NOTE:** The pressure relief valve must be replaced by a certified service technician if defective.
3. Tampering with the pressure relief valve will void the warranty.
4. *On the back of the water heater:* ROTATE the pressure safety valve handle (Red) about 3~5 times counter-clockwise (*Fig. 36*). Check the drain hose for water (*Fig. 37*). Water in the drain hose indicates the pressure safety valve is working properly.

NOTE: Never actuate the drain plug as long as the appliance is still hot.



Hard Water and Decalcification

For prolong usage, when exposed to higher water hardness concentrations, it is advised to provide a proper water treatment device for the incoming water to the coach.

- Hard water may lead to performance reduction of your appliance over time.
- *Contact Furrion for decalcification instructions.*



Exterior Spray Port

NOT a Potable (Drinking Water) System

This Spray-Away unit should be drained for transport, storage, or if freezing weather is expected.

To drain:

1. **Turn OFF water supply lines to Spray Away unit.**
2. **REMOVE spray nozzle from coil hose and insert hose into brass quick connect.**
3. **OPEN hot and cold valves if this unit has them.**
4. **HOLD open end of the hose near ground and drain system.**
5. **DISCONNECT hose when not in use.**

Exterior Spray Port (If So Equipped)

A quick-connect spray port is equipped on most floorplans for washing /rinsing outside your RV.

TO USE: Attach the supplied quick-connect hose and sprayer to your spray port.

- **If dry camping,** TURN ON the *12-volt Water Pump*.
- **When finished,** Turn OFF the *12-volt Water Pump*.
 - Disconnect the quick connect hose and drain any excess water from the hose and sprayer nozzle.

Bathroom Shower

Unlike your home, the RV does not contain a water pressure balance valve. When the shower is in use, DO NOT run any other water until shower is finished. Air may need to be bled out of the plumbing lines before a steady stream of water will flow.

1. Keep aware of the water heater and holding tank capacities. All water used, will drain through the plumbing lines into the *Grey Water Holding Tank*.
2. CHECK that the *Water Heater* is turned ON, and
 - ALLOW sufficient time for the water to heat.
 - **If dry camping,** TURN ON the *12-volt Water Pump*.
3. Turn ON the hot and cold knobs, and ADJUST the water temperature *before* showering.
4. To conserve water while showering, wet yourself down, turn OFF the water while using soap, *then* rinse.
5. When shower is finished, shut OFF the hot and cold knobs.
 - There is no *Shut-Off Valve* for the showerhead; shut-off is at the hot and cold knobs only.
 - The showerhead may still drip slightly after use, even in the OFF position. **This is normal.** *It does NOT indicate a leak or defect.*

Maintenance

The shower walls in your RV are made of *plastic*. **Clean with a mild detergent soap and warm water ONLY.**

- DO NOT use gritty or abrasive particle soaps or scouring compounds to clean the plastic.
- *Please also refer to the manufacturer's manual.*

Faucets

The faucets inside your RV operate much the same way as the faucets in your home.

- CHECK that the amount of water available is sufficient, and **If dry camping**, Turn ON the *12-volt Water Pump*.
- To OPEN the faucets, turn ON the hot and cold knobs, then ADJUST the temperature to your comfort level.
- CLOSE the faucets when a sufficient amount of water is released.

Draining the Fresh Water System

The low-point drain valves release water in the supply lines by opening the valves and all faucets. The water heater has its own drain plug. To drain the permanent fresh water holding tank and supply lines:

1. OPEN all faucets.
2. OPEN the *Fresh Water Holding Tank Gate Valve*. This is the white T-handle located under the RV, close to the axles. See *Photo, top right*.
3. REMOVE the caps from the red and blue *low point drains*.
4. DRAIN the sink by removing the drain cap.
5. Turn ON the water pump and allow it to run as needed.
6. ALWAYS use the water heater **P & T Valve** (*Pressure and Temperature Valve*) to relieve any water pressure, BEFORE removing the water heater drain plug.
 - Even a small amount of water pressure may cause water to spray out when the drain plug is removed.
 - See *Water Heater Diagram on page 93*.
7. REMOVE the water heater **drain plug**.
 - AFTER the water heater is finished draining, REPLACE the drain plug.

After draining the Fresh Water System:

EMPTY the grey and black water holding tanks at an appropriate facility or according to local public codes. It is normal for some water to remain in the tanks after draining.

- See **page 102**, *Emptying the Black & Grey Water Tanks*.



Fresh Water Holding Tank Gate Valve, located under the RV



Low-Point Drain Valves located under the RV

Sanitizing the Fresh Water System

Use the following procedures to sanitize your Fresh Water System (*or Potable Water System*) when it is new, becomes contaminated, or has not been used for a period of time.

Before you begin:

- *If you have installed an aftermarket water filter, make sure that it is set to the **Bypass** position.*

To sanitize the fresh water tank & fresh water system:

- PREPARE a *Chlorine Solution* using one (1) gallon of water and one-quarter (1/4) cup of household bleach (5% Sodium Hypochlorite solution).
- PREPARE approximately one (1) gallon of solution for every fifteen (15) gallons of holding tank capacity.

NOTE: As an option, several commercial solutions are available, and should be used as directed on the package.

1. ACCESS the *12-volt Water Pump, Winterization Valve, and Suction Line (Location varies by floorplan)*.
See steps 6a-6c on page 88-89.
2. PLACE the *Suction Line* into the container of * **Chlorine Solution**.
3. TURN ON the water pump.
4. OPEN all faucet fixtures, allowing all of the solution to pass through.
5. ALLOW the solution to stand for three (3) hours, *then DRAIN* tank and *FLUSH* the system with fresh water.
BEFORE use, RUN plenty of water through the entire system.

To remove any chlorine odor/taste which may remain, replace the Chlorine Solution with Vinegar Solution:

6. PREPARE a *Vinegar Solution* of one (1) quart vinegar to five (5) gallons water.
PREPARE approximately one (1) gallon of solution for every fifteen (15) gallons of holding tank capacity.
7. PLACE the *Suction Line* into the container of * **Vinegar Solution**.
8. REPEAT steps 3-5 above with Vinegar Solution in place of Chlorine Solution.

Winterization Valve

BEFORE winterizing, please read the "Winterizing the Furrion Tankless Water Heater & Plumbing System" instructions in your Owner's Manual.

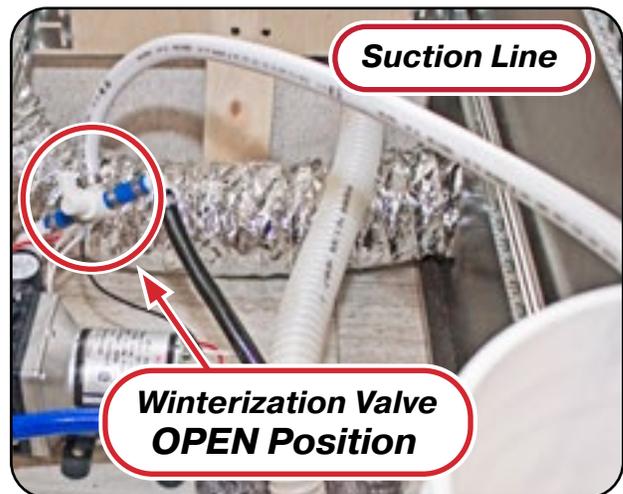
Access the Water Pump (Location Varies) - See page 88-89, # 6a-c.

Normal Use:

1. Turn the *Winterization Valve* to the **CLOSED** position.

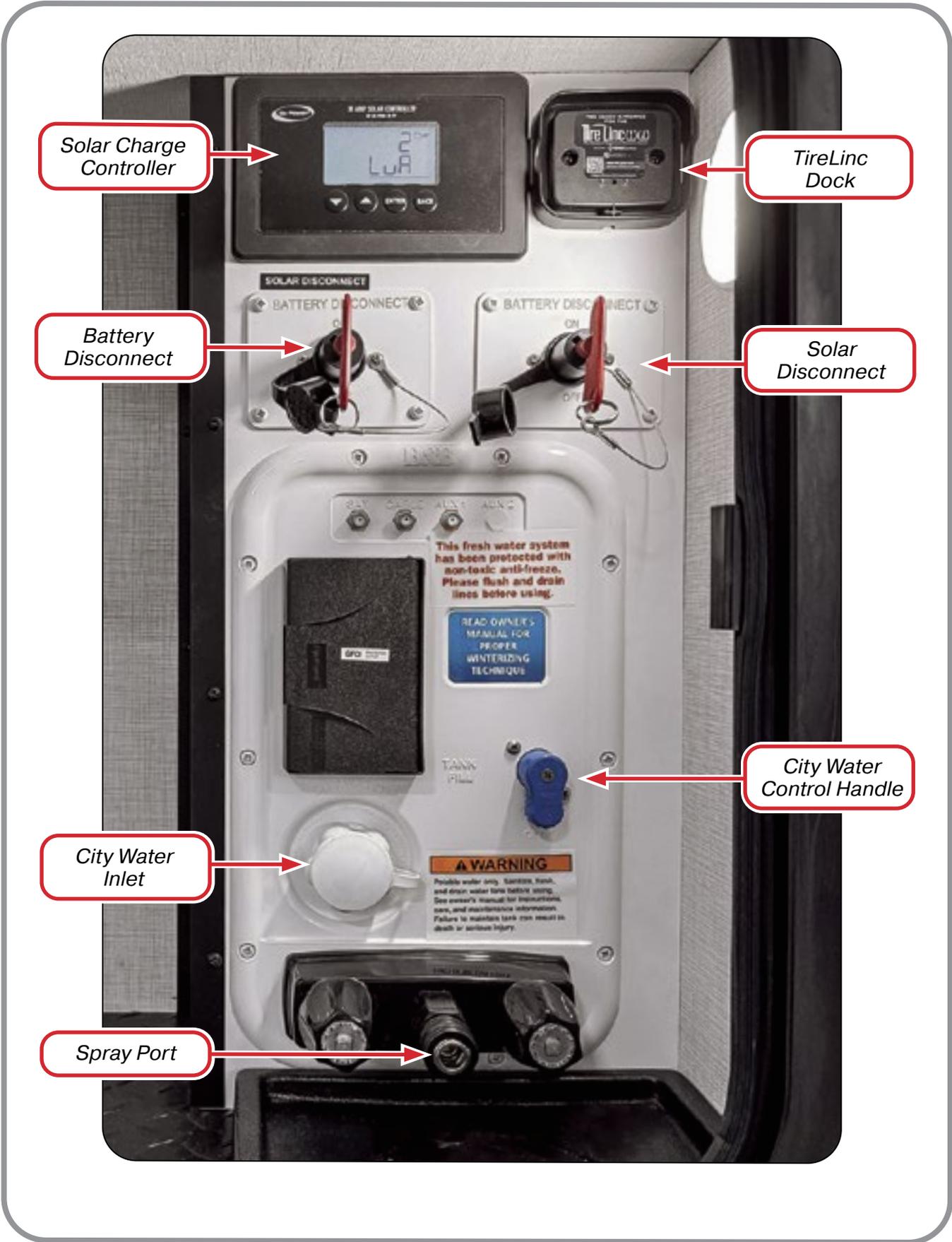
Winterizing / Sanitizing:

1. **TURN** the *Winterization Valve* to the **OPEN** position.
2. **LOCATE** the *Suction Line*.
 - **REMOVE** the cap.
 - **Winterizing** - **PLACE** the *Suction Line* into the container of **RV antifreeze**
 - **Sanitizing** - **PLACE** the *Suction Line* into the container of **Chlorine/Water mixture**.
3. **TURN ON** the *Water Pump*.
4. **OPEN** all faucet fixtures individually until **RV antifreeze** or **Chlorine/Water mixture** is present, including stool and outside faucet / spray port.



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Universal Docking Station



Solar Charge Controller

TireLinc Dock

Battery Disconnect

Solar Disconnect

City Water Control Handle

City Water Inlet

Spray Port

 **WARNING**

NEVER travel with full black or grey water holding tanks. This not only wastes your fuel but depending on the location of the tank(s), it can affect your tow vehicle handling characteristics.

NOTICE

DO NOT add automotive antifreeze or caustic chemicals such as laundry detergents into the holding tanks. Although these products may have a deodorizing effect, they may damage the plastic and rubber parts of the plumbing system or the components.

Black Water & Grey Water System

Your RV toilet drains into the *Black Water* (sewage) holding tank. The sinks and shower drain into the *Grey Water* (waste water) holding tank.

- **ALWAYS** empty the *Black and Grey Water Holding Tanks* **BEFORE** traveling to avoid carrying unnecessary weight.
- If you are dry camping and cannot immediately empty your holding tanks, reduce your vehicle speed until you reach a dumping station.
- The *Cargo Carrying Capacity* of your RV is based on **empty** holding tanks. Any additional weight for the contents of your holding tank(s) **reduces** your *Cargo Carrying Capacity* by the same amount.

Traveling with your holding tank(s) full could result in the following conditions:

- Reduced available cargo capacity.
- Exceeding individual tire ratings and/or the GAWR or GVWR.
- Potential damage to suspension components, such as springs, tires and axles.
- Reduced hitch weight, if your RV holding tank(s) are located behind the axles.
- Trailer sway and other handling difficulties, as a result of the hitch weight being too light.

Toilet

Your RV toilet uses only one to three quarts (*or 1-3 liters*) of water per flush, about *ten times less* than a residential toilet. Additional water may be needed to flush solids from the drain line into the holding tank.

- **ALWAYS** continue to run water for an **extra 10-15 seconds after flushing.**
- **NOT** flushing with enough water, can result in **clogged pipes or tanks.**

To help prevent a toilet blockage:

- **Before use:** FLUSH the toilet several times, releasing enough water to cover the bottom of the holding tank.
- ALWAYS maintain four to six inches (10-15 cm) of water in the toilet for better performance.
- ALWAYS use RV grade, single-ply toilet paper.
- NEVER flush *any* foreign objects down the RV toilet. (i.e., *hygiene products, cleaning wipes, paper towels, diapers*)

Cleaning and maintenance

- CLEAN the toilet regularly.
- DO NOT use undiluted chlorine or caustic chemicals (i.e., *laundry bleach, chemical drain openers*) in the RV toilet.
 - These products will DAMAGE the seals in the toilet and dump valves.
- Applying petroleum jelly to a *sticky* toilet ball valve will provide waterproof lubrication without damaging the seals.

Black & Grey Water Holding Tanks

Black water (sewage) tank preparation

- Adding a RV holding tank deodorizer (customer supplied) will help break down tank contents and control odors.

DO THE FOLLOWING:

- **BEFORE the first use, and AFTER dumping the holding tanks** (*unless you are winterizing your RV*):
 1. RELEASE one to two quarts (1-2 *liters*) of water into the toilet bowl.
 2. ADD the tank deodorizer (customer supplied) to your black water tank per the packaging instructions.
 3. FLUSH the toilet and allow at least two gallons (8 *liters*) of water to flow into the holding tank.

Grey water (waste water) tank preparation

No special preparation is required. If needed, control odors from the grey water system by adding a small quantity of baking soda or RV holding tank deodorizer down the sink or shower drain.

NOTICE

It is important to prevent solid waste buildup. Follow the toilet manufacturer's instructions each time after emptying the black water holding tank.



Sewer cap must be securely in place while the vehicle is in motion.



Sewer Outlet Connection Is Located Under the RV on the Off-Door Side.

Emptying the Black & Grey Water Tanks

The black tank and grey tank drain valves (or dump valves) are located near the *Sewer Outlet Connection*, under the RV on the off-door side, and/or in the utility center.

- **ALWAYS drain the black water holding tank FIRST.**
 - **THEN, drain the grey tank waste water to help rinse any solids from the sewer outlet and hose.**
1. Driving to a disposal site will normally loosen any accumulated waste solids from the sides of the holding tanks.
 2. To make drainage easier, LEVEL the RV.
 3. LOCATE the *Sewer Outlet Connection*,
 - REMOVE the sewer hose housing dust cap, and
 - ATTACH your sewer hose (customer supplied).
 4. PLACE the other end of the sewer hose into the approved dump station.
 5. OPEN the black tank drain valve (or dump valve) by carefully **pulling** the handle out towards you.
 - CLOSE it by **pushing** the handle shut after the black water holding tank has drained.
 6. EMPTY each grey water holding tank (one at a time).
 - OPEN the 1st Grey Tank dump valve
 - CLOSE the valve after the tank has drained.
 - REPEAT for the 2nd Grey Tank.
 7. REMOVE, CLEAN and STORE the sewer hose.
 8. CLOSE the sewer hose housing dust cap.

When connected to a (campground) sewer drain

- Keep the *Black Tank Drain Valve* CLOSED until the holding tank is *at least* $\frac{3}{4}$ full. This should provide enough water to completely drain the holding tank.
- DO NOT leave the *Black Tank Drain* in the OPEN position.

Dump station locations

Dump station locations throughout the United States and Canada can be found on many websites and publications including Woodall's, Rand McNally Camp Guide, Good Sam Camp Guide, or KOA Kampgrounds Camp Guide. Some gas stations also have dump stations.

If you need assistance with the purchase or installation of a sewer hose or hose extension, please contact your dealer.

Vents & Vent Pipes

For the plumbing system to drain properly:

- The vents and vent pipes **must** release air from the grey and black water holding tanks.
- ALWAYS keep the exterior vent cap on the roof clear of any obstructions.
- In some models the vent pipe may be a *wet vent*. This allows water to drain downward with air flowing upward in the same pipe.

Drain Pipes With Dry Sealing Valve

Your RV may be equipped with a dry sealing valve to prevent the escape of odors from your waste system and eliminate the need for P-traps. Should the RV drain piping system become clogged, a mechanical clean-out tool is used to open the drain pipe.

- **It is important to remove the dry valve before passing the clean-out tool through the piping.**
- **Passing a mechanical clean-out tool through the waterless valve may cause damage to the internal seal that may potentially allow sewer gases to escape to the RV interior.**

Drain Pipes With P-Traps

The drain pipes may be equipped with a *P-trap* installed to help prevent odors from escaping into the RV. **During travel, water from the P-traps may spill and permit odors into the RV.**

- By adding water and using a RV approved deodorizing agent you will dissolve the contents faster and will keep the drain lines and tanks clean and free flowing.
- These chemicals are available at an RV supply store or your dealer.

NOTICE

Remove the waterless trap before using mechanical drain cleaning devices. Waterless trap can be damaged.

CAUTION

DO NOT use the tank flush valve unless the fullway termination valve (gate valve) is in the open position.

This can result in an unsanitary condition leading to illness or personal injury.

NOTICE

When flushing the black tank, the gate valve must be open or damage may occur to the system.

Black Tank Flusher

The black tank flusher is designed to rinse the interior of the black (waste) tank. A separate water hookup is located on the off-door side.

To flush the tank after dumping:

1. Leave the *Sewer Hose* connected to the *Outlet Pipe*. CHECK that it is routed to the dump station inlet.
2. CONNECT a **garden hose** to the *Black Tank Flusher Inlet*. **DO NOT use your fresh (potable) water hose.**
3. OPEN the *Black Tank Gate Valve*.
4. OPEN the water supply to full pressure to flush tank.
5. When the water runs clear from the sewer hose, SHUT OFF the water supply, *then*
 - DISCONNECT the garden hose from the water source.
6. DO NOT disconnect the hose from flush inlet UNTIL all water has drained from the system.

- **DO NOT add any check valves to this system.**
- **DO NOT leave a hose connected when not in use.**



The Black Tank Flusher Inlet is located on the off-door side of the RV.

Propane System

The propane system includes the propane cylinders, propane regulator, hoses, piping and copper tubing lines to each gas appliance. Follow the manufacturer's instructions for each propane appliance and all safety precautions.

Maintenance

Although both Grand Design RV and your selling dealer carefully test the propane system for leaks, travel vibrations can loosen fittings. Have the RV's propane system checked at all connections soon after your purchase. System should also be checked when the propane tanks are filled for the first time, and again after 5,000 miles of travel.

Continue propane system checks by a certified propane service representative (*at least once a year*) as part of your normal maintenance.

Propane Gas

In your RV, propane or LP (liquefied petroleum) is used by the stove, furnace, and hot water heater.

- An unpleasant "*sulfur or rotten egg*" smell is added to propane to alert customers to leaks, which can create a safety hazard.

When a propane cylinder is low, there may be a different odor *like onions or garlic*, that may be mistaken for a gas leak. This odor will usually disappear when the cylinder is filled.

- *If the odor persists*, turn OFF the valve(s) and have the propane system inspected by your dealer or certified propane service technician.

DANGER

IF YOU SMELL
PROPANE GAS
STOP!

Quickly and carefully perform the 6-step procedure in the red box at the bottom of this page.

DO NOT remove the following label from your RV:

⚠ DANGER

ALL PILOT LIGHTS, APPLIANCES AND THEIR IGNITORS (SEE OPERATING INSTRUCTIONS) SHALL BE TURNED OFF BEFORE REFUELING OF FUEL TANKS AND/OR PROPANE CONTAINERS. FAILURE TO COMPLY COULD RESULT IN DEATH OR SERIOUS INJURY.

⚠ WARNING

DO NOT FILL PROPANE CONTAINER(S) TO MORE THAN 80 PERCENT OF CAPACITY. FAILURE TO COMPLY COULD RESULT IN A FIRE OR PERSONAL INJURY.

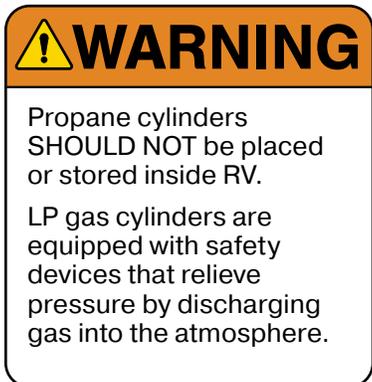
⚠ CAUTION

THIS PROPANE PIPING SYSTEM IS DESIGNED FOR USE WITH PROPANE ONLY. DO NOT CONNECT NATURAL GAS TO THIS SYSTEM. Securely cap inlet when not connected for use. After turning on propane, except after normal cylinder replacement, test propane piping and connections to appliances for leakage with soapy water or bubble solution. Do not use products that contain ammonia or chlorine. LP-101

IF YOU SMELL PROPANE

1. **EXTINGUISH** any open flames, pilot lights and all smoking materials.
2. **DO NOT** touch electrical switches.
3. **SHUT OFF** the propane supply at the container valve(s) or propane supply connection.
4. **OPEN** doors and other ventilating openings.
5. **LEAVE THE AREA** until odor clears.
6. Have the propane system **CHECKED** and leakage source **CORRECTED** before using again.

**FAILURE TO COMPLY COULD RESULT IN AN EXPLOSION
RESULTING IN DEATH OR SERIOUS INJURY**



Propane Gas Cylinders

While under pressure in the cylinder, propane gas is compressed into its liquid form. Propane will not run through the appliances in its liquid state. As the fuel is released from the cylinder to operate an appliance, it changes from liquid to gas.

- **IMPORTANT:** Propane EXPANDS 1½ percent for every ten degree increase in temperature.
- **Sufficient space MUST be left inside container for expansion of gas during warmer weather.**

Propane cylinders (also referred to as LP bottles) are used for the storage and delivery of propane gas. Propane cylinders are filled by weight, expressed in pounds. For filling, a certified propane facility is required, and cylinders must be removed from the RV.

When the propane system is not in use, the main shut off valve MUST be kept closed. To close the propane cylinder main shut off valve: **HAND TIGHTEN ONLY, do not use tools.** *Over-tightening may damage the interior seals on the cylinder valve seat.* If this type of damage occurs, the cylinder valve WILL NOT close properly.

DOT (Dept. of Transportation) Cylinders are the most common for use on RV trailers. DOT cylinders equipped with an OPD and ACME TYPE 1 service valve are identified by the triangular service valve knob.

- ALWAYS close the service valve and install a dust cap or plug when transporting or storing disconnected containers whether full or empty.

DOT cylinders are typically marked with “top” or an arrow indicating the correct orientation of the cylinder(s).

- ALWAYS mount, store and transport the cylinder(s) in the position specified.
- ALWAYS securely re-install DOT cylinder(s) to the RV after they have been removed for filling or replacement.

The cylinders are equipped with an **Over-fill Protection Device** (OPD) designed to reduce the potential of overfilling. They are also equipped with an ACME service valve that is for connection of the TYPE 1 ACME pigtail hose assembly to the RV two-stage regulator. The TYPE 1 ACME pigtail hose assembly is a right-hand threaded, wrenchless connector that features a thermally sensitive sleeve and excess flow device.

Max output is 200,000 BTU/hr. It is used to connect propane cylinders to regulators, hoses and other fittings. It is not for use on gas grills and other low pressure devices.

Servicing or filling

Have the RV checked for leaks at the connections on the propane system soon after the purchase and the initial filling of each propane cylinder.

- **While the propane tanks are being filled, ONLY the certified propane service technician should be near the RV. No one should be inside.**

When you have a new cylinder filled for the first time, make sure your propane supplier purges your new cylinder of trapped air. Otherwise, an improper mixture of gas and air will make it impossible to light your propane appliances. For best performance the new propane cylinder must be carefully purged before filling.

LP gas container overfill

NEVER allow your propane cylinder(s) to be filled beyond the maximum safe level marked on the cylinder. Your propane system is designed for gas vapor only. An overfilled cylinder could force *liquid* propane into the system, creating a hazardous condition.

Propane Leak Test

ALWAYS test for leaks with a solution of dish soap & water.

- Apply the solution with a spray bottle, to the outside of all gas line joints and fittings.
- If a leak is present, the soapy solution will bubble at the leak point.
- As a general rule, small bubbles indicate a small leak while large bubbles indicate a larger leak.

NEVER use a solution containing ammonia or chlorine when locating leaks.

- These products are corrosive to copper gas lines and brass fittings, which could result in deterioration of the copper and brass components.

If a leak is not fixed by tightening the connection, shut OFF the propane system valve(s) and immediately contact your dealer or a certified propane service representative.

WARNING

Before entering a propane or fuel service station make sure all pilot lights are extinguished.

- SHUT OFF gas to all appliances by closing the propane gas main shut off valve.
- Always SHUT OFF any engine before refueling.
- DO NOT smoke, *and*
- DO NOT operate other ignition sources while refueling.

WARNING

If you suspect your propane container has been overfilled, contact your dealer or a certified propane technician for assistance immediately.

DO NOT use or attempt to service an overfilled propane container yourself.

DANGER

Extinguish all flames. NEVER use an open flame to check for leaks. Failure to follow this warning could result in a fire or explosion resulting in serious injury or death.

WARNING

DO NOT check for leaks using products that contain ammonia or chlorine; these products can cause cracks to form on the metal tubing and brass fittings.

 **WARNING**

Test Propane Gas Alarm operation after the RV has been in storage, before each trip and at least once per week during use.

 **WARNING**

NEVER turn the 12-volt battery disconnect control to the off position and disconnect the battery cable to silence the alarm.

 **WARNING**

The pigtail hose **MUST** be installed to avoid tension or pulling stress at either end of the hose.

Keep the pigtail hose away from sharp edges of the cylinder collar, rigid corners, walls, doors or other compartment structures including the cover.

 **WARNING**

Ensure that all fasteners are secured before traveling.

Propane Alarm

Your RV is equipped with a propane alarm. Please read and follow the component manufacturer instructions supplied in your Owner Information Package.

*For detailed information on this alarm, See **page 25-27**, Propane Gas (LP) Alarm.*

Installing The Propane Cylinders

The position of the propane cylinder(s) and hoses is critical to proper operation and propane flow. FOLLOW these instructions to make sure your propane container(s) are connected properly.

1. CHECK that all the RV appliances are shut OFF.
2. CHECK that each LP cylinder *Shut-Off Valve* is CLOSED.
3. PLACE the *LP Cylinders* on the LP cylinder brackets or LP tray (if so equipped) located on the trailer A-Frame, and secure them.
4. The two (2) 3/8" low-pressure pigtail hoses should be attached one to each side of the auto changeover regulator.
5. CHECK to make sure the LP regulator is mounted on the housing so the vent is pointed downward.
 - *The LP Regulator Vent must be unobstructed at all times.*
 - Also CHECK the vent opening after freezing rain, sleet, or snow to make sure that ice has not formed in the vent.
6. ATTACH the TYPE I end of each pigtail hose to each LP cylinder.
7. ATTACH the main supply hose from the regulator to the brass manifold fitting in the frame of the trailer. The swivel brass nut on the main hose will be your final attachment.

Remember each time the propane container is removed:

- CHECK that ALL fittings are tight.
- CHECK that ALL connections are tested with a *Propane Leak Detector* (or soapy water solution).
- OPEN the main shut-off valve on the LP cylinder **very slowly**. This avoids *propane freeze up*, caused by a fast rush of propane to the excess flow valve.

- If you do experience a *propane freeze up*, close the main valve and wait at least fifteen (15) minutes before trying again. *For more information, refer to the regulator manufacturer's operator manual.*
- LISTEN carefully. A *hissing* sound longer than one second, may indicate a propane leak. If you suspect that there is a leak, close the shut-off valve, *then* contact your dealer or certified propane technician for repair assistance.
- REPLACE all protective covers and caps on the propane system after filling. Make sure the valve is closed. Install the LP bottle cover and use the bungee cord at the bottom to secure it in place for travel or storage purposes.

Propane Regulator

Your Serenova TT is equipped with an *automatic* two-stage regulator. Its sole function is to reduce the pressure from the propane containers to a safe and consistent low operating pressure.

The first stage reduces the container pressure to 10-13 lbs. The second stage further reduces the 10-13 lbs. of pressure to an operating pressure of 11" W.C. (Water Column) or 6.35 oz. of outlet pressure to your appliances.

For optimum performance, the 2nd stage will need to be adjusted by your dealer (or certified propane service technician) using a properly calibrated manometer.

- If the pressure is **too high**, the safety and performance of the propane system will be affected.
- If the pressure is **too low**, the LP appliances will NOT operate correctly.

With both cylinders full of propane, turn the lever on the regulator towards the cylinder you wish to use first. This will now be the *supply* cylinder and the other the *reserve*.

Slowly open both cylinder valves. When the *supply* cylinder is empty, the indicator will change to red. Now turn the regulator lever to the *reserve* cylinder side. You may now remove the empty cylinder to have it refilled without interrupting the flow from the full bottle. After filling the cylinder, connect the pigtail hose and slowly open the bottle valve.

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 propane leak resulting in a fire or explosion that could cause serious injury or death.

WARNING

Propane regulators must always be installed with the regulator vent facing downward. Regulators that are not located in baggage compartments have been equipped with a protective cover.

Make sure the regulator vent faces downward and (if applicable) the cover is in place to minimize vent blockage that could result in excessive gas pressure causing fire or explosion.



Automatic Change Over Propane Regulator

Propane System Hoses, Tubes, Pipes & Fittings

The hoses, pipes, tubes and fittings used in your propane system are designed to withstand pressures exceeding those of the propane system. However, because environment and time can both contribute to the deterioration of these components, they must be inspected for wear at regular intervals.

- Inspect the hose before each season and when having the tank refilled.
- Look for signs of deterioration such as cracks or loss of flexibility.
- When replacing the hose or other propane components, always replace them with components of the same type and rating (check with your dealer).

Fittings are used to connect the various system components to each other. The P.O.L. (Prest-O-Lite) fitting at the end of the propane supply hose is made of brass so that pipe sealants are not necessary to prevent leaking.

- It also has a *left-handed thread*, TURN *clockwise* to REMOVE, and TURN *counter-clockwise* to TIGHTEN.
- The P.O.L. fitting has been designed to help restrict the flow of LP gas in the event of a regulator failure or hose malfunction.

Traveling With Propane

BEFORE towing your RV,

1. ALWAYS check that the propane bottles are properly fastened in place, *and*
2. TURN OFF the gas at the LP bottle.
This disables all gas appliances and pilot lights.

DO NOT operate Propane System while the RV is in motion.

- Some states prohibit propane appliances to be operated during travel (especially in underground tunnels).
- Make sure to know the laws for the areas where you travel.

Using The Propane System

After the RV is completely set up and you are prepared for camping enjoyment, use the following steps for propane operation:

1. CLOSE ALL burner valves, controls and pilot light valves.
2. **OPEN the propane tank's main valve VERY SLOWLY.** This avoids a fast rush of propane vapor through the excess flow valve which can cause a *propane freeze-up*.
 - If a *propane freeze-up* occurs, CLOSE the main valve and wait 15 minutes before trying again.
3. LISTEN carefully as propane begins to flow.
 - If a hissing noise is heard for more than one or two seconds, CLOSE the main valve and contact your dealer to have your propane system tested.
4. LIGHT the appliances ONLY as directed in the appropriate manufacturer manual (found in your Owner Information Package).

BEFORE using the propane system, make sure that you read and understand ALL instructions and safety requirements. The Owner Information Package contains operator manuals for the various appliances hooked to your propane system.

If you have additional questions or concerns, consult with your dealer and/or the specific manufacturer.

WARNING

DO NOT operate the gas appliances while your RV is in motion.

Unpredictable wind currents may be created, and cause flame reversal in the water heater burner tube, which could result in fire damage.

This could also activate the water heater's *Thermal Cut Off Fuse* and completely shut down the water heater until the thermal cut off fuse is replaced.

Calculating Propane Use

Your Serenova TT's furnace, water heater and range (if applicable) all may use propane to operate. Use the BTU rating of each appliance to determine how long your propane supply will last. Propane consumption depends on their individual use and the length of time operated.

Most RV gas appliances are operated intermittently. Unless there is heavy use of hot water, the water heater consumption of propane is minimal. During cool temperature or high wind conditions, furnace consumption can be extremely high.

To calculate your propane supply, take the BTU ratings for your propane appliances and divide that into the BTU availability. Each gallon of propane (3.86 liters) produces about 91,500 BTUs (46,514 kilojoules) of heat energy.

Average Propane Consumption

Appliance	Average BTU Consumption/Hr.	Kilojoules/Hr.
Water Heater	8,800	9,300
Furnace	16,000 - 35,000	16,900 - 36,900
Range w/ Oven	7,100	7,500
Range - Rear Burner	6,500	6,900
Range - Front Burner	9,000	9,500

Appliances

BEFORE using your RV appliances:

Please read and understand the manufacturer owner manual for each specific component.

- **Follow all instructions, warnings, & safety alerts found in the manufacturer owner manuals when using the appliances in your RV.**
- **If you have any questions contact your dealer or Grand Design RV Customer Service.**

These manuals are found in your Owner Information Package.

If there have been modifications or replacements made to your RV, then these instructions may not apply. Please contact the service center or technician who performed the modifications or substitutions if assistance is required.

Microwave / Convection Oven

- Sufficient 120-volt power **MUST** be available **BEFORE** operating the microwave.
- To prevent damage, **ALWAYS** make sure that the microwave turntable is secured prior to traveling.

Refrigerator, 12-Volt

A RV refrigerator is not intended for quick cooling or freezing. For best results, stock with food that is *already* cold or frozen.

- Arrange food items so that air can circulate freely.
- **DO NOT** cover the shelves with paper or plastic.
- Keep the area at the back of the refrigerator clean and free of debris.
- While you travel, most refrigerators will keep food cold or frozen for eight hours without running.
- For optimum efficiency and performance, the refrigerator should be checked at least twice a year as part of routine maintenance.

WARNING

DO NOT use portable fuel burning equipment (i.e., wood and charcoal grills or stoves) inside the RV. Use of these items inside an RV may cause fires or inability to breathe.

WARNING

Never leave cooking food unattended. Turn pan handles inward, but not over the tops of the other range burners. Ensure that pans used are large enough to contain the food and avoid boil-overs. Heavy splattering or spills left on the cook top can ignite and cause burns.

WARNING

If using glass, ceramic, earthenware or other glazed utensils (or cookware) verify that it is safe for use on the top burners. Only certain types of utensils (or cookware) are suitable for surface or top burner use.



SCAN the QR Code, above, with the camera on your smartphone or tablet to download the **Furrion Induction Cook-top Operating Instructions.**

Range Hood

The range hood has both a light and fan control switch on the front panel. The 8" x 8" aluminum mesh grease filter (located on the underside range hood) can be gently hand-washed using mild soap and water.

Induction Cooktop

To prevent damage, ALWAYS use the manufacturer recommended size flat bottom pan(s). Properly matching pan size to burner size will improve efficiency. The pan should be large enough to cover the range top burner, but not more than one inch larger than the burner grate.

- Using *undersized* pans could expose a portion of the heating element to direct contact. ***This may result in the ignition of clothing.***

DO NOT use large pots & pans, broiler pans, griddles, etc., that cover more than one range top burner at a time. This will create excessive heat that may cause melting, sooting, or discoloration.

In Case Of A Grease Fire

Grease is flammable. Wipe any spills immediately. NEVER allow grease to collect around the top burners or on the cook top surface.

If a fire does start, follow these basic safety rules:

1. Have everyone evacuate the RV immediately.
2. After everyone is clear and accounted for, check the fire to see if you can attempt to put it out. If it is large or the fire is fuel-fed, get clear of the RV and have the Fire Department handle the emergency.
3. Try to smother a flaming pan with a tight-fitting lid or cookie sheet.
4. Never pick up a flaming pan.
5. Flaming grease *outside* of the pan can be extinguished with baking soda or a multipurpose Dry Chemical or Foam-Type fire extinguisher.

Electronics

Bluetooth & TV Audio Wall Plate

The following is a basic overview of the audio/visual (A/V) electronics operation. The information in this section is written for original factory-installed equipment usage. Refer to the manufacturer's user guides included in your Owner Information Package for detailed operating instructions for each specific component, or visit that manufacturer's website.

If there have been modifications or replacements made to your RV, then these instructions may not apply. Please contact the service center or technician who performed the modifications or substitutions if assistance is required.

BASIC OPERATION

Power

PRESS the Power button (1) to turn the unit on or off. The BTWP2 will resume audio playback of the last mode selected (Bluetooth or TV Audio) when turned on.

Speaker Zone Selection

The A button (3) and B button (4) on the BTWP2 control the speaker zone audio output. PRESS the Zone A button (3) or Zone B button (4) to turn the corresponding speaker zone ON or OFF. (Note: The Bluetooth mobile device or the TV controls the volume output of the BTWP2).

BLUETOOTH OPERATION

The BTWP2 includes built-in Bluetooth technology that allows you to connect this wall plate to Bluetooth devices for streaming audio playback.

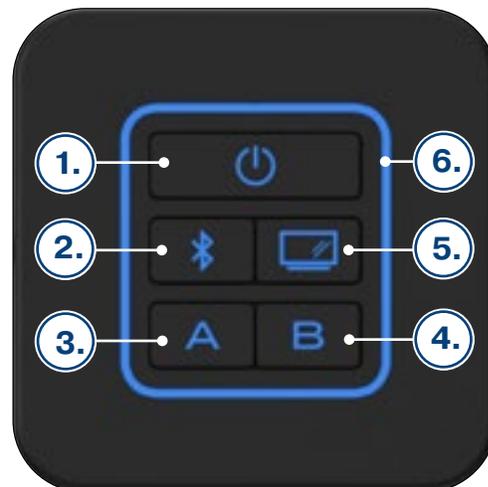
Bluetooth Mode

PRESS the Bluetooth button (2) to select Bluetooth mode, the BTWP2 will audibly prompt "Bluetooth Mode".

Pairing a Bluetooth Device

- PRESS and HOLD the Bluetooth button (2) for 3 seconds to start the Bluetooth pairing process, the Bluetooth button (2) will start to blink.
- *The BTWP2 will be in pairing mode for 120 seconds.*
- Go into the Bluetooth pairing settings on the mobile device and SELECT "Bluetooth RV1" to pair. (Android devices will pop up a pairing request, PRESS "pair".)

Once the Bluetooth device is connected, the BTWP2 will audibly prompt "Bluetooth Connected".



Bluetooth & TV Audio Wall Plate (BTWP2)



SCAN the QR Code, above, with the camera on your smartphone or tablet to download the **BTWP2 manual.**

CAUTION

The TV power supply should be turned OFF when connecting and/or disconnecting the cables to the power supply and antenna, but should be turned ON when testing for voltage.

Cable/Satellite Outlet

Both Cable and Satellite connection outlets are found in the outside Universal Docking Station.

- The *Cable* input connects to an RG6 cable run through in-line splitters to provide service at multiple locations.
- The *Satellite* inputs connect to RG6 cables run directly to specific locations (no splitters). This allows for clean transfer of HD signals from the satellite dish.

Please refer to the (customer supplied) satellite manufacturer manual for setup, care and maintenance instructions.

TV Reception Basics

TV broadcasting is a point-to-point communication. Any obstructions between the transmitter and the antenna will degrade the signal, affecting picture quality.

- Television stations transmit their broadcast signal "over the air" to surrounding areas.
- TV antennas are designed to receive the broadcast signals.
- Picture quality depends on the antenna type and your distance from the transmitter.
- The further you are from the transmitter, the weaker the signal becomes, affecting picture quality.



*Antenna Power Supply
(Wall Plate)*

TV Signal Booster

- **The TV Signal Booster must be turned ON for improved *antenna* reception.**
- The TV Signal Booster sends 12-volt DC power to the TV roof antenna. This voltage energizes the transistors in the antenna head amplifier.
- Turn OFF the *TV Signal Booster* to view cable/satellite TV, or to use a DVD/Blu-ray player or Game System.

TV Roof Antenna

To watch local TV stations, turn ON power to *both the TV and the TV Roof Antenna*. For a list of all DTV signals available at your location, go to:

fcc.gov/media/engineering/dtvmaps

Winegard AIR 360 Operation

- AIR 360 can receive VHF/UHF/FM frequencies while parked.
- You must run a *Channel Scan* on your TV in order to receive maximum programming.
- Ensure the antenna power supply (wall plate) is in the “ON” position and the indicator LED is illuminated.
- A new scan will find any new channels that have been added in your area as well as finding any channels that have changed or moved since the last scan.

While the steps to perform a channel scan may vary between televisions or compatible devices, below are some general guidelines to follow.

Run a “Channel Scan” using the television remote:

For instructions on navigating the menu to perform a Channel Scan on the Television equipped on your RV:

- *See the Television User/Owner’s Manual found in your Owner Information Package.*
1. SELECT “Antenna” or “Air,” depending on your TV. Make sure you are not on “Cable”.
 2. SELECT “Channel Search” or “Channel Scan”.
 - The steps to perform a channel scan may vary.
 - If the wording on your TV differs from the options shown, refer to your TV user manual for help.
 - **Running a *Channel Scan* is NOT the same as pressing Channel UP/DOWN on your remote.**
 3. To keep your saved channels up-to-date, it is recommended to run a Channel Scan:
 - Once per Month,
 - When a channel is lost, *and*
 - When you change locations.





SCAN the QR Code, above, with the camera on your smartphone or tablet to download the **Voyager Back-Up Camera manual.**

Back-Up Camera

All Serenova Travel Trailers are equipped with a Voyager Back-Up Camera observation system. This product is intended to assist in safe driving and to allow the driver to have a broader view.

- ***Please follow all instructions, warnings, and safety alerts in the manufacturer User Manuals found in your Owner Information Package.***

Backup Camera Maintenance

An RV backup camera system requires little to no maintenance once installed. However, it is important to take proper care of your system and clean the monitor on occasion. Below are a few guidelines.

- DO NOT wash your vehicle in an automatic car wash or with high-pressure water. ***This can damage the camera.***
- KEEP the monitor away from excessive moisture and extreme heat or cold.
- KEEP liquids away from the monitor.
- Occasionally CLEAN the monitor surface with a soft cloth moistened with water or glass cleaner.
 - DO NOT clean it with strong chemical agents or abrasive cleaners.
- ALWAYS disconnect power before cleaning.



Voyager Back-Up Camera System



Wireless Transmitter for Back-Up Monitoring

Heating & Cooling

The following section contains an overview of the original factory-installed heating and cooling components. For more information on each specific component, please refer to the manufacturer's operating instructions found in your Owner Information Package.

If there have been modifications or replacements made to your RV, then these instructions may not apply. Please contact the service center or technician who performed the modifications or substitutions if assistance is required.

Ducting & Return Air

NOTE: Registers SHOULD NOT be completely CLOSED.

All registers and return air grills **MUST** remain free and clear of any obstructions. The adjustable registers are **ONLY** intended to **REDUCE** airflow as needed.

Air Conditioner

Your thermostat controls the roof-mounted air conditioning system equipped on your RV. **BEFORE operating the air conditioner: ALWAYS check that you have sufficient power available.**

Cooling vs. Heat Gain

Under the best conditions, the roof air conditioner(s) can **ONLY** cool the temperature of outside air by 20° F. During hot weather your RV will absorb heat throughout the day, increasing the inside temperature. This is referred to as **heat gain**.

To keep the inside temperature comfortable, reducing the RV's heat gain is just as important as the cooling ability of your air conditioner. **To reduce heat gain, follow these steps:**

1. Park the RV in a shaded area.
2. CLOSE the window shades, blinds or drapes.
3. Use the awnings to shade your RV from sun exposure.
4. AVOID the use of heat producing appliances.
5. SET the air conditioner *Fan/Cooling mode* to HIGH.
 - During high humidity or high temperatures, this will provide maximum efficiency.
6. Turn ON the air conditioner early in the morning, to give it a head start on cooling.

NOTICE

DO NOT operate the air conditioner without the Return Air Filter.

Operation without the filter allows lint and dirt normally stopped by the filter to accumulate on the air conditioner's cooling coil.

This will lead to a loss of air volume, possible equipment damage and an expensive cleaning process.

 **WARNING**

DO NOT operate the furnace when the slide rooms are retracted in the closed position.

 **WARNING**

The furnace should be inspected periodically (*monthly* during the heating season) for the presence of soot on the vent.

Soot is formed whenever combustion is incomplete. This is a visual warning that the furnace is operating in an unsafe manner.

If soot is observed on the vent, IMMEDIATELY shut the furnace OFF and contact a certified service agency. Operating the furnace under this condition could lead to serious property damage, personal injury or loss of life.

 **WARNING**

To ensure your personal safety, DO NOT obstruct or alter the furnace in any manner. DO NOT install screens over the vent for any reason. Screens will become restricted and cause unsafe furnace operation. For your safety, only OEM factory authorized parts are to be used on your furnace.

NOTICE

DO NOT leave a roof vent open when the RV is stored or unattended for long periods. High winds, other unusual conditions or obstructions may occur; and if so, the resulting leakage could cause non-warrantable damage.

Air Conditioner, Continued

Air conditioner gasket

The air conditioner is subjected to wind pressures along with motor vibration during normal operation. A *Foam Gasket* forms a weatherproof seal between the roof material and the sub-frame of the air conditioner.

- INSPECT the gasket seal (at least) annually.
- CHECK for leaks and RE-TIGHTEN the mounting bolts if needed.
 - To prevent damage to the gasket - use care;
 - DO NOT *over-tighten* the bolts.

The air conditioner gasket will eventually wear out and need replacement. To gain access to the bolts, remove the filtered panel cover on central air systems or the entire air box on non-central air conditioners.

Furnace

The RV furnace installed in the RV is controlled by the thermostat. The furnace requires both 12-volt power and propane gas for full operation. ***Make sure you have sufficient power available before operating your furnace.***

- ALWAYS have your furnace maintenance completed by a certified technician (at least once a year, more often depending on furnace use).
- NEVER attempt to repair the furnace yourself.
- **DO NOT store anything in the furnace compartment.**

If you have any questions, contact your dealer or Grand Design Customer Service.

Fireplace (If So Equipped)

Please read and understand your fireplace's manufacturer owner's manual BEFORE using. Follow all instructions, warnings, and safety alerts for operation, service and maintenance.

- *This manual is found in your Owner Information Package.*
- *If you have further questions, please contact your dealer.*

Roof Vents

The roof vents allow fresh air to circulate through your RV. They may be electric (12-volt DC) and/or manual. To prevent unexpected weather damage, make sure that roof vents are closed while traveling and when you will be away from the RV.

Digital Thermostat

Please read and understand the thermostat manufacturer's **Installation, Operation & Application Guide** found in your *Owner Information Package*.

HVAC Mode and Fan Mode Selection

- Upon power up, the display will show the HVAC Mode set to **Off**, the Fan Mode set to **Off**, the current temperature, temperature units, and the sensor in use.
- To SET the HVAC Mode, PRESS the knob. The display will now show the HVAC Mode section with the currently selected mode *blinking*.
- ROTATE the knob to scroll through the options.
 - When the desired setting is *blinking*, PRESS the knob to accept.
- If **Off**, **Cool**, or **Cool+Heat Mode** was selected, the **Fan Mode** will illuminate with the currently selected mode *blinking*.
- ROTATE the knob to scroll through the options.
 - When the desired setting is *blinking*, PRESS the knob to accept.
- The display will now show HVAC Mode and State (if applicable), the current temperature, temperature units, the sensor in use, the set point temperature (when in an HVAC mode other than **Off**), and the Fan Mode and State (if applicable).
- Once the thermostat returns to this screen, it will check to see if any outputs need to be enabled or disabled and performs those actions.

Set point Adjustment

- To select a *Set Point*, the thermostat **must** be in any HVAC Mode other than **Off**.
- Once an HVAC mode has been selected and the set point temperature is visible, ROTATE the knob.
- The display will now *blink* the set point temperature and adjust it according to the rotation direction (***clockwise for INCREASE*** and ***counter-clockwise for DECREASE*** of the set point).
 - When the desired set point is displayed, PRESS the knob.
- The display will revert to the previously displayed information with the new set point. Once the thermostat returns to this screen, it will check to see if any outputs need to be changed and perform those actions.



A Digital Thermostat is wall-mounted inside your Serenova.



The Patio Awning Switch is located inside the RV, on the Command Center.

! WARNING

To prevent the awning motors from overheating:

DO NOT exceed 4 minutes of operation per hour.

! WARNING

IMPACT OR CRUSH HAZARD

- NEVER leave an open awning unattended. Keep awning stowed (closed) when snow, heavy rain, wind, and severe weather conditions are expected.
- DO NOT allow water to pool, snow to accumulate, or heavy debris on awning fabric. DO NOT hang or place anything on awning. The awning will become unstable, and could bend or collapse.

Patio Awning, Girard

To operate the door-side Patio Awning:

- BEFORE USING YOUR AWNING make sure that all of your RV's electrical circuits are operating correctly.
- LOCATE the Awning switch on the Command Center.
- PRESS and HOLD Patio Awning switch until the awning is in the desired position, *then* RELEASE the switch.
- RETRACT the awning into the *Travel Position* when you will be away from the RV for an extended period of time, *and* during windy or stormy weather conditions, or
- Select "Awning" on the *Compass Connect® System*, See **page 82**, *Grand Design Compass Connect® App*.

Girard Systems awnings may be operated in light wind and rain conditions. When periods of heavy rain and or high wind are expected the awning **must** be closed. **NEVER leave the awning open and unattended.**

- **Damage caused by wind and rain is not covered by warranty.**

All awnings must be closed prior to moving the RV for any reason. A VISUAL CHECK that every awning is fully closed is required as an extra safety precaution.

- **Damage caused by failure to comply with these instructions is not covered by warranty.**

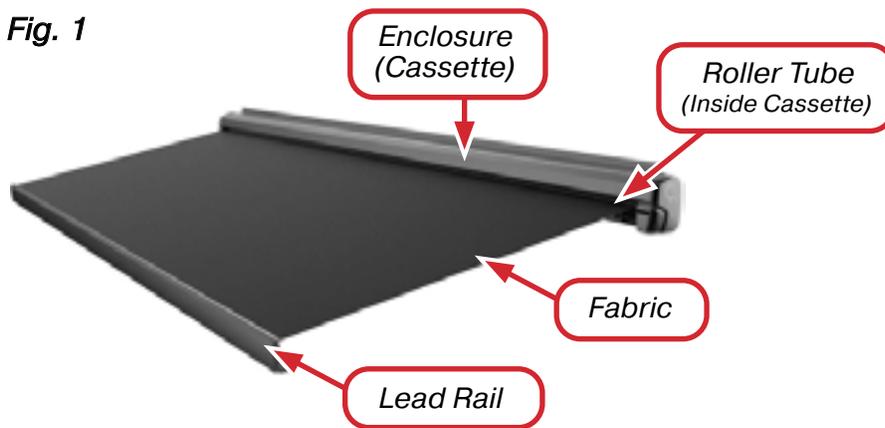
BEFORE USING YOUR AWNING, ensure that the area into which the awning will be deployed is free of obstructions (trees, walls, pillars, posts, other vehicles etc.).

- **Damage caused by collisions with any of the above or similar is not covered by warranty.**

BEFORE USING YOUR AWNING make sure that all of your RV's electrical circuits are operating correctly.

- The enclosure (or cassette) protects the awning while closed.
- The roller tube which is mounted within the cassette.
- The top cover or fabric rolled onto the roller tube and connected to the lead rail that extends from the enclosure when the awning is opened (*Fig. 1*).
- The folding arms support the lead rail and the fabric.
- Tubular motor which is mounted inside of the roller tube that controls the extension and retraction of the awning.

Fig. 1



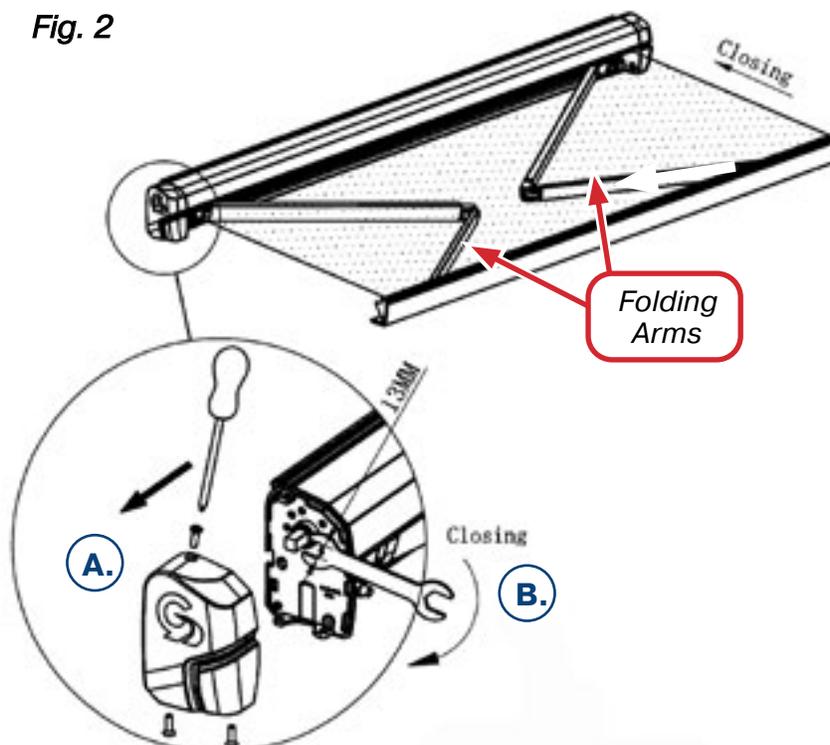
Manual Override

1. If a motor issue were to occur, use the manual override to close the Girard.

NOTE: The *Manual Override* operates one-way ONLY. It is only used to CLOSE the awning.

2. Remove the endcap opposite the motor, by removing the 3 Philips head screws, see Fig. 2A.
3. Using a 13mm wrench, TURN the manual override shaft in order to close the awning, see Fig. 2B.
4. A right hand motor version of the Girard Awning is shown in Fig. 2B.
 - If you have a left hand version, the manual override will be on the opposite side.

Fig. 2



SCAN the QR Code, above, with the camera on your smartphone or tablet to download the **Girard Awning Manual.**

! WARNING

DO NOT attempt any repairs to any awning. The awning roll tube is under extreme spring tension. Repairs should only be performed by an authorized dealer and/or repair center.

Patio Awning, Girard, Continued

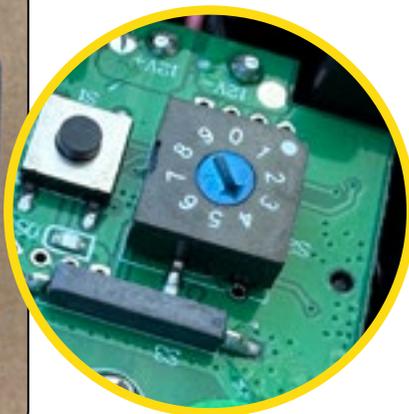
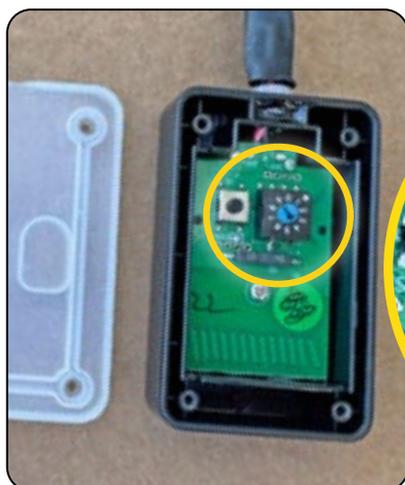
Testing The Motion Sensor (Wind Sensor)

1. Partially extend the awning (at least 3 feet).
2. Physically activate the Motion Sensor by shaking the awning lead rail.
3. At this point the awning should retract; if not, check that there is a 12-volt DC power supply to the motion sensor and that the Motion Sensor is correctly programmed.

NOTE: Under windy conditions, the *Motion Sensor* sends a signal to retract the awning at a preprogrammed sensitivity. The power system of the vehicle must be able to withstand the resulting surge of current. The surge will be the greatest when the awnings are fully extended. When testing the system, verify that the awnings will close from the fully extended position.



Awning Motion Sensor



Sensitivity Adjustment

Tools needed:

- Fine tip Phillips Screwdriver, Fine tip Flat Head Screwdriver
- A. RUN OUT the awning at least 2 feet.
 - B. REMOVE Screw holding the awning power wire.
 - C. UNSCREW and UNPLUG power wire to prevent the awning from moving.
 - D. REMOVE 2 screws to remove motion sensor controller.
 - E. REMOVE 4 screws from back of motion sensor controller.
 - F. Sensitivity is preset at 4. (*The higher the number, the more force it will take to activate the sensor.*)
 - G. ADJUST sensitivity to the desired setting with a small flathead screwdriver.
 - H. Reassemble the controller, and secure it back onto the awning,
 - Plug in the power wire and secure replace the screw before closing the awning.

Adjusting Pitch and Elbow Height

NOTE: Adjustment of the Elbow height and pitch, will affect the height of the awning lead rail when it is fully deployed. This adjustment is usually required after an arm replacement. Also, if the elbow of the arm hits the bottom of the casing as the lead rail closes.

Tools Required:

- 17mm open-end wrench
- 19mm (3/4") open-end wrench
- 4mm Allen wrench

Elbow Height

- Extend the awning approximately 12".
- To lower the elbow:**
LOCATE screw C located on the side of the shoulder, the top bolt. (Fig. 3)

 - Using a 17mm open-end wrench, ROTATE the bolt **counter-clockwise** to lower the arm position.
 - Then use a 19mm wrench to TIGHTEN Screw D, the bottom bolt.
- To raise the elbow:**
LOCATE screw C located on the side of the shoulder, the top bolt. (Fig. 3)

 - Using a 17mm open-end wrench, rotate the bolt **clockwise** to raise the arm position.
 - Then use a 19mm wrench to loosen Screw D, the bottom bolt.
- AFTER adjustment:**
CLOSE the awning completely to ensure smooth operation, that the lead rail lies flush and square along the length of the cassette, and that the arms fold inside the cassette without interference.

Fig. 3

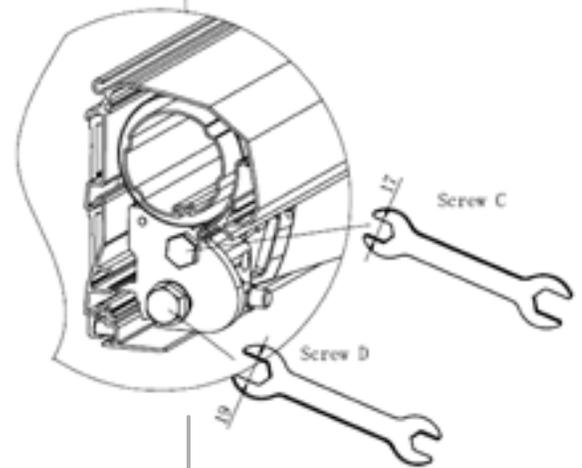
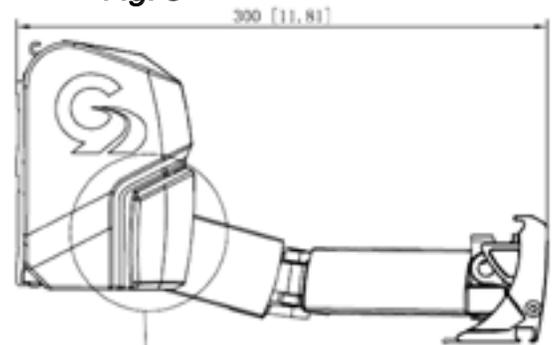


Fig. 4

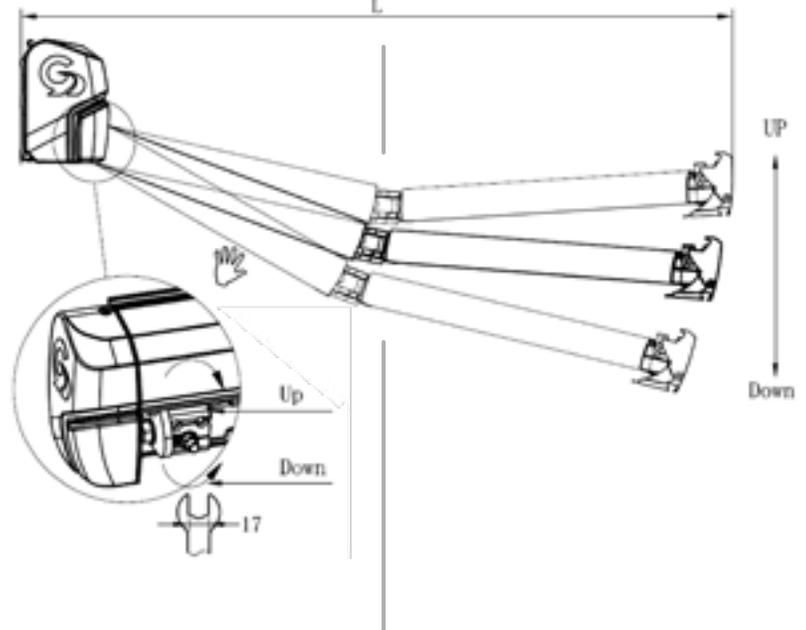
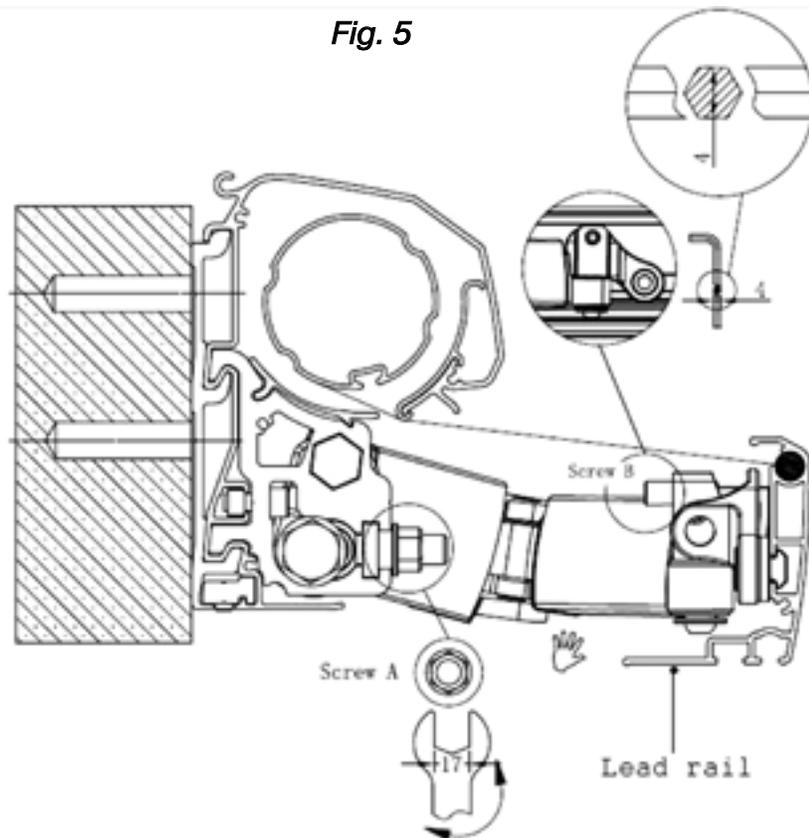


Fig. 5



Adjusting Pitch

- a. Extend the awning to its fully extended length.
- b. Locate screw A, adjustment nut located on front side of the shoulder assembly (Fig. 4, 5). Using a 17mm wrench rotate the nut **counter-clockwise** to lower the pitch or **clockwise** to raise the pitch.
 - Do not over tighten as this will result in damage to the awning.
 - Lifting up on the arm slightly to relieve pressure may be necessary.
- c. Close the awning completely to ensure smooth operation and that the lead rail lies flush and square along the length of the cassette.

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! WARNING

The slideout room and mechanism are a potential crush hazard. Disconnect the auxiliary battery to disable power to the slideout(s) before working on or under them. Failure to do so could result in serious injury or death.

! WARNING

Stand clear of the room's interior path and verify there are no exterior obstructions before extending or retracting the slideout. Failure to do so could result in serious injury or death.

! WARNING

The slideout mechanism has hard, sharp metal edges. DO NOT allow children to play under a slideout in the extended position. Failure to do so could result in serious injury or death.

! WARNING

Ensure the slideout is in the closed position prior to hooking the RV to the tow vehicle. Failure to do so could result in serious injury or death.

Slideout Systems (If So Equipped)

Slideout rooms are designed to provide you additional living space during stationary camping.

BEFORE operating your slideout system:

- Check that you have sufficient power available.
 - Level *and* Stabilize the RV.
- LEVELING helps to keep the RV square, so the slideouts extend, retract and seal correctly.
 - If the RV is NOT level, the slideout rooms and/or mechanisms may become damaged.
 - The slideout rooms DO NOT need additional support. *Non-warranty damage can occur from improper use of aftermarket support jacks.*

Slideout Operation

It is normal for the slide rooms to make *creaking* or *squeaking* noises while moving. These noises are especially common 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 slideout.

1. **ALWAYS level and stabilize the RV, BEFORE operating your slideout system.**
2. CHECK that your *auxiliary battery* is fully charged or the RV is connected to shore power.
 - **To maximize available power, turn OFF all unnecessary lights.**
3. CLOSE all cabinet doors and drawers.
4. BEFORE **extending** or **retracting** the slideout room:
 - CHECK that the *interior* path of the slideout room is clear of people, pets, furniture, clothing, etc.
 - CHECK that the *exterior* path of the slideout room is free from any obstructions.

5. INSPECT the sides, top and bottom of the extended slideout room. If the outside of the slideout room is wet, wipe it dry before retracting.
6. CLEAN any water puddles or debris brought inside your RV from slideout operation immediately.
7. PRESS and HOLD the appropriate slide room switch to either IN or OUT, until the room is completely extended or retracted.

- DO NOT hold the slide room switch past the point the room is fully extended/retracted or damage may occur.
- For the weather seals to be effective, the slideout room MUST be *completely* extended/retracted.
- BEFORE operating your slide systems, review all important safety alerts.

Slideout maintenance

While the slideout room is *extended*, the outside surfaces of the room and mechanism may collect dirt and debris. The slideout seals are not designed to remove the debris or any water that may accumulate.

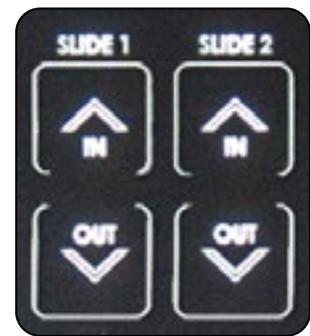
- When you **retract** the slideout, any debris on the *outside* of the room, is brought *inside* your RV.

BEFORE retracting the slideout(s):

- INSPECT the outside surfaces for snow, ice, dirt, dust, insect nests, etc.
- CHECK for standing water on the slideout topper awning (if so equipped).
- CLEAN and DRY the outside surfaces of the room and mechanism as much as possible.

Contact your dealer or Grand Design RV Customer Service for troubleshooting and/or repair *if your slideout system:*

- Stalls out before reaching end of stroke, *or*
- Does NOT close and seal tightly.



The Slide Room Switches are located inside the RV, on the Command Center.

NOTICE

Inspect both sides of the slideout room for interior or exterior obstructions prior to operating.

NOTICE

Ensure that the RV is level before operating the slideout room.

Water leaks and other problems could result if the slideout is operated without leveling the RV.

NOTICE

For long-term storage, it is recommended that the slide rooms be closed (retracted).

NOTICE

Never 'jump' or charge the auxiliary battery from the power connections on the In-Wall Controller. Always do this at the auxiliary battery.



SCAN the QR Code, above, with the camera on your smartphone or tablet to download the **Lippert SlimRack® Slideout Owner's Manual.**

! WARNING

Always make sure that the slideout room path is clear of people and objects before and during operation of the slideout. Always keep away from the gear racks when the slideout room is being operated. Obstructions in the slideout room's path can cause serious personal injury, severe product or property damage.

! CAUTION

Moving parts can pinch, crush or cut. Keep clear and use caution.

! CAUTION

When manually retracting the slideout room, make sure that both sides of the slideout room move together. Damage to the slideout room may result if movement is not uniform.

SlimRack® Auto-Programmable Slideout (If So Equipped)

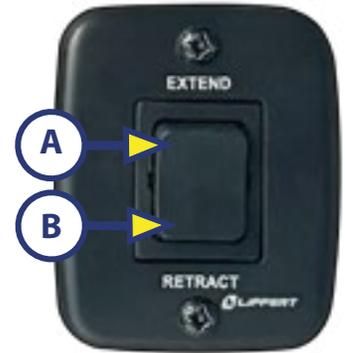
The Auto-Programmable SlimRack® Slideout System combines seamless flush-floor style and no step up. **BEFORE using your Lippert SlimRack® Auto-Programmable Slideout:**

Please read and understand the full SlimRack® Auto-Programmable Slideout manufacturer's Owner's Manual.

- **To download the SlimRack® Slideout System Manual, SCAN the QR Code, left, with your tablet or smartphone.**
- **Follow all instructions, warnings, & safety alerts.**

Fig. 1

The SlimRack Slideout Switch is located inside the RV, on the Command Center.



Operation

Prior to Moving the Slideout Room

- Make sure the engine or generator is running to ensure ample voltage is being supplied to the slideout controller.
- Set the parking brake if applicable. The RED and GREEN LED lights will begin to flash, confirming the override mode.

Extending the Slideout Room

1. The engine or generator must be running, or the unit must be plugged into the shore power.
2. Transmission must be in park or neutral (if applicable).
3. If applicable, set the park brake and level the unit.
4. If equipped, remove transit bar.
5. If equipped, turn "on" the on/off switch or key.
6. Press and hold the OUT button (**Fig. 1A**).
 - There will be a slight delay before the slideout room will begin to move. **This is normal.**
7. Release the button when the slideout room is fully extended and stops moving.

NOTE: Once the room has stopped moving, it is not necessary to press the switch a second time.

8. If equipped, turn “off” the on/off switch or key.

Retracting the Slideout Room

1. The engine or generator must be running, or the unit must be plugged into the shore power.
2. Transmission must be in park or neutral (if applicable).
3. If applicable, set the park brake and level the unit.
4. If equipped, turn “on” the on/off switch or key.
5. Press and hold the IN button (**Fig. 1B**). There will be a slight delay before the slideout room will begin to move. **This is normal.**
6. Release the button when the slideout room is fully retracted and stops moving.

NOTE: Once the room has stopped moving, it is not necessary to press the switch a second time.

7. If equipped, turn “off” the on/off switch or key.
8. If equipped, install transit bar.

Troubleshooting the SlimRack® Auto-Programmable Slideout (If So Equipped)

Auto-programmable controllers, 697096 which connect to a rocker switch, have the ability to detect and display several faults. When a fault is detected, the slideout room movement may stop and two different LEDs on the controller will flash in a pattern.

NOTE: Not all rocker switches contain fault indicator LEDs. For best results when reading fault codes, refer to the controller’s Fault Code LED scheme and Auto-Programmable Controllers Fault Codes table. **See Fig. 2 & Fig. 4 on the Next Page.**

1. The Fault Code LED on the rocker switch (**Fig. 2A**) will flash RED a number of times corresponding to the number of red flashes on the controller (**Fig. 4A**).

NOTE: Refer to the Fault Code Tables for the controller of the unit to best determine what caused the fault.

2. The Motor LEDs (**Fig. 4B**) on the controller will flash GREEN a number of times corresponding to which motor had the associated fault. For example, two GREEN flashes and four RED flashes means there is a motor fault on Motor 2.



Fig. 2

Troubleshooting the SlimRack® Slideout (If So Equipped), Continued



Fig. 4

NOTE: For major faults, the controller will automatically enter **Emergency Jog** mode when motor movement is not detected by the controller in either direction during slideout room activation. When in **Emergency Jog** mode, the controller will jog both motors in the direction the rocker switch is pressed (IN or OUT).

The rocker switch may need to be pressed multiple times to fully retract or extend the slideout room. Take the unit to an OEM-authorized dealer for service.

The controller will return to normal operation mode after five minutes of inactivity or by cycling the power to the controller.

NOTE: The Auto-Programmable SlimRack® Slideout manufacturer’s Owner’s Manual:

- **Fault Code Table - Auto-Programmable Controllers 697096/700156**

Electrical Override Modes

For major faults, controllers 697096, will automatically enter “Emergency Jog” mode when motor movement is not detected by the controller, in either direction, during slideout activation. When in Emergency Jog mode, the controller will jog both motors in the direction the switch is pressed (IN or OUT). The switch may need to be pressed multiple times to fully retract or extend the slideout. Take the unit to an OEM-authorized dealer for service.

NOTE: At any time during the override procedure, the unit will exit **override** mode if the slideout has not been moved for five minutes. The controller will return to **normal** operation mode after five minutes of inactivity or by cycling power to the controller.

⚠ CAUTION

During the Electrical Override procedure, the slideout room has NO stop locations.

Use another person to assist in determining when the slideout room is retracted. Damage to the slideout room can occur if the slideout room is retracted too far.

Manual Override Mode

In the event that power is lost to the SlimRack® slideout motor(s) or when the Electrical Override Mode does not work, the slideout room can be manually retracted by following these steps.

1. Gain access from either the inside or outside of the unit to the vertical channel assembly by removing the OEM trim and flange pieces on the slideout room box. The motors (**Fig. 7**) are currently located at the top of the channel.
2. If applicable, use a Phillips head screwdriver to remove the top screw from the bulb seal at the top of the vertical channel (**Fig. 6**).
3. Pull down the bulb seal (**Fig. 6**) and remove the motor cover (**Fig. 6**). The motor cover may stick to the bulb seal.
4. If there is a retaining spring (**Fig. 8**), use a pick tool to remove the end of the retaining spring from the motor spring clip. **DO NOT remove the retaining spring screw.**
5. If not equipped with a retaining spring, use a 5/16" open-ended wrench or ratcheting box wrench to loosen the motor retaining screw (**Fig. 9**) one to two rotations. **DO NOT remove the motor retaining screw.**
6. Unplug the motor from the harness and remove the motor by lifting it up and out of the column.
7. Repeat steps 1-6 for the other side.
8. Push the slideout room uniformly into the retracted position.
9. Once the slideout room is retracted, secure the slideout room in-place by:
 - A. Re-installing the motors. If there is a retaining spring, make sure the end of the retaining spring is re-hooked to the motor spring clip (**Fig. 8**).
 - B. Torquing the motor retaining screw to 40 in-lbs (**Fig. 9**) with the motor retainer fully engaged.
 - C. Using a transit bar (slideout locking bar). Make sure motor is properly seated with no gap between the mounting bracket and block (**Figs. 8 and 9**).
10. Have the slideout room serviced by the OEM-authorized dealer as soon as possible. DO NOT operate slideout room until service is complete, as damage to the slideout room may result.

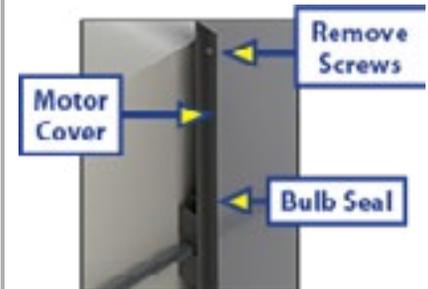


Fig. 6

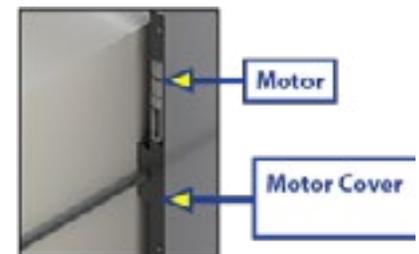


Fig. 7



Fig. 8

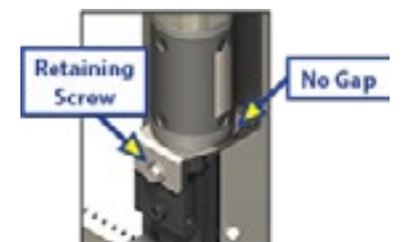


Fig. 9

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Interior Care

Cleaning the Interior

To keep the value of your RV, perform regular maintenance using the proper materials and procedures.

- Check the component manufacturer's information for the recommended cleaning agent.

DO NOT use flammable liquids or sprays to clean your RV.

Using the wrong cleaner may result in damage to the surfaces in your RV. To check if a cleaner will cause damage, test it in a small, out of sight area, or contact your dealer for assistance.

Cabinetry & Tables

- To keep cabinetry and tables looking like new, regularly dust the hardwood doors, cabinet fronts and tables.
- Use a soft cloth dampened with a cleaning polish or mild detergent solution.
- AVOID using ammonia based products or silicone oils as they may cause damage if used over a long period of time.
- Although the finish is durable and resistant to most household spills, they should be wiped up promptly to avoid any potential problems.
- Avoid prolonged exposure to direct sunlight, high temperatures or high humidity. These conditions can cause damage to both the finish and the wood itself.

Pantry

Your RV's **load capacity** is designed by *weight*, NOT *volume*. All available storage space cannot necessarily be used.

- Use the pantry to store items you wish to take with you as you travel and camp.
- The cabinetry has been designed to accommodate normal camping items which are bulky but not necessarily heavy (i.e., paper plates, flatware, cookware, etc.).
- Check that all pantry items are secured so that they do not shift during travel.

Paneling

- To clean, use a mild solution of soap and lukewarm water with a soft sponge or cloth.
- DO NOT use abrasive cleaners as they could cause the vinyl to scratch and turn dull.
- Grease spots and stubborn dirt can be cleaned off with an all-purpose spray cleaner.

Countertops

To prevent permanent damage:

- ALWAYS use hot pads or trivets under hot pans, dishes, or heat producing appliances such as frying pans.
- ALWAYS use a cutting board; never use a knife directly on the countertop.
- AVOID harsh chemicals such as drain cleaners, oven cleaners, etc.
- DO NOT leave cleaners with bleach on the surface. Wipe them off promptly.

Laminate countertops

Glass rings, food spills, water spots and smudges usually wipe off with a damp sponge. Stubborn stains can be removed with a general-purpose spray cleaner. Some stains can be removed by squeezing fresh lemon juice over the stain and allowing the juice to soak for approximately forty-five minutes. After 45 minutes, sprinkle baking soda over the lemon juice and rub with a soft cloth.

Solid surface countertops

Solid surface materials are easy to clean. Commercial solid surface cleaners, soapy water, or ammonia based cleaners will remove most dirt and residue from all types of finishes. AVOID window cleaners as they can leave a waxy build up that may dull the surface. A damp cloth followed by a dry towel will remove watermarks. Disinfect the surface periodically with diluted household bleach (one part **water** to one part **bleach**).

For additional information on the removal of difficult stains or surface damage repair, please refer to the countertop manufacturer's user guide.

Flooring

- ALWAYS test cleaning agents for colorfastness in a hidden or inconspicuous area.

Carpet

Vacuum regularly with a vacuum cleaner with a revolving brush or beater bar. Be sure the vacuum does not have teeth, combs or rough edges as they may damage the carpet. It is important to remove loose soil and debris while it is on the surface.

- Heavily traveled areas (i.e., walkways, areas in front of the furniture) may be protected with small throw rugs to prolong the life of the carpet.

Some spills contain chemicals that will destroy carpet fibers and dyes. If you have doubts about what caused the spot, contact a professional carpet cleaner. Because of the additional dirt typically associated with camping, we recommend that you vacuum the carpet frequently. Have tough and deep stains professionally steam cleaned. Use spot removers for minor spills. Always test the carpet for color fastness in an inconspicuous area before using any product.

Vinyl flooring

Periodically vacuum or sweep to remove dirt and gritty particles. Although most common spills will not permanently stain the vinyl floors, they are usually easier to remove if wiped up before they set. Simply blot with a paper towel and wipe clean with a damp cloth. As part of a regular maintenance program, sponge mop the entire floor. Do not use dish detergents or vinegar and water because they will dull your floor.

To care for the vinyl floor covering, use a damp mop with water and a mild cleaner. **DO NOT SOAK THE FLOORING.** Use care to avoid wetting the carpet edges. To prevent the linoleum from *yellowing*, avoid cleaners that contain oil based solvents (i.e., any cleaners containing lemon oil, Murphy's Oil Soap, etc.).

Free-Standing Table & Chairs (if so equipped)

The free-standing dinette table can be positioned to seat up to four people. To prevent damage when traveling, the chairs must be fastened down securely, and the table must be closed into the travel position.



The free-standing dinette chair has hidden storage. To access the storage area lift the seat cushion.

Furniture Upholstery

Maintaining your furniture upholstery and keeping the interior clean will help to retain the value of your RV.

- Vacuum the furniture regularly using a soft brush attachment to remove any loose dirt or debris.

Fabric

Fabric should be professionally cleaned if it becomes stained or soiled. For more information, refer to the specific furniture manufacturer's care instructions.

Suede

- Suede should be professionally cleaned if it becomes stained or soiled.

Vinyl

Vinyl should be professionally cleaned if it becomes stained or soiled. If a spill does occur:

- **USE water-based cleaners ONLY.**
- **BLOT up the spot.**
 - *DO NOT rub it in, or saturate the area.*
- **DO NOT use solvents.**
 - *Solvents may have an adverse reaction to the specific backing of your upholstery fabric.*
- **DO NOT dry clean any vinyl components.**
 - *If they are dry cleaned, the vinyl on the reverse side will shrink, become hard and crack.*
- **Clean the suede or vinyl upholstery ONLY as recommended.**
 - *Cleaning methods other than those listed, may produce undesired results and even damage the upholstery. This type of damage is not warrantable.*



Some, but not all, recliner and Theater Seats have storage in the middle armrest.

Bi-Fold Sofa (If So Equipped)

Please refer to the Bi-Fold Sofa manufacturer's care instructions for this product.

ABS Plastic

DO NOT use gritty or abrasive particle soaps or scouring compound to clean ABS plastic. ABS plastic components will retain their original beauty with reasonable care.

- DUST & WIPE CLEAN with soft, damp cloth or chamois, wiping gently.
- AVOID using *Citrus* or *biodegradable* cleaners containing D-Limonene; these cleaners may damage plastic materials.

Decor Items

Decor Glass - Use a glass cleaner to remove smudges, smears and spots. If there is any decorative etching on the decor glass, use care when cleaning around that area.

Window treatments, curtains, blinds and shades

Dust occasionally with a vacuum and soft brush attachment. Professionally clean only.

Shower Walls & Base

Use a mild detergent soap and warm water to clean the shower wall and base. **DO NOT** use gritty or abrasive particle soaps or scouring *compounds*.

Sink & Shower Fixtures

- Use mild dish soap and water to clean these fixtures.

DO NOT use harsh chemicals or sprays. A mild solution of vinegar and water works well to remove hard water spots and stains from the sink or shower fixture.

Stainless Steel Sink & Appliances

- **DO NOT** use abrasive cleaners, scouring pads or steel wool.
 - **DO NOT** use oven cleaner or any cleaners that contain bleach or chloride.
 - Water that evaporates on a Stainless Steel surface may leave spots.
1. Dampen a soft cloth in warm water mixed with mild dish soap.
 2. Wipe the surface. Clean *with the grain*, not across.
 3. Rinse the cloth and wipe again.
 4. Blot the surface dry with a towel to prevent water spots.

Glass cleaner or cleaners made specifically for stainless steel may also be used. **BEFORE** cleaning the entire surface, test the cleaner on a small hidden area.

Exterior Care

Many different materials comprise the RV exterior including; glass, fiberglass gel-coat, plastics, aluminum, automotive grade paint finishes, and sealant.

- The chance of damage to the exterior finish increases the longer a foreign substance remains on the surface.
- Frequent washing and waxing is the best way to protect your RV from this damage.

The following materials deposited on the RV's surface may result in corrosion, staining, and/or chemical spotting:

- Road Tar, Dirt, and Dust
- Road Salt and Sodium Chloride
- Bird Droppings / Bugs / Tree Sap
- Acid Rain / Industrial Fallout / Pollution
- UV Exposure and Moisture

Cleaning the Exterior

Frequent washings also protect your RV from environmental conditions, such as rain, snow and salt air.

- WASH your RV as soon as possible if it becomes contaminated with foreign material.
- AVOID parking under trees or near ocean sea salt.
- DO NOT *scrape* ice or snow from the painted surface, ALWAYS *brush off* the affected area.
- If anti-freeze, gasoline or any solvents are spilled on the painted surface, RINSE the area with water *immediately*.
- Bugs and bird droppings should be rinsed off daily.

Washing

- DO NOT wash the RV in direct sunlight.
- PARK in the shade and spray RV with water to remove dust.
- Next, using an ample amount of clean water and a sponge or car washing mitt, WASH the RV from top to bottom.
- Use a mild car-washing soap if necessary.
- RINSE thoroughly & WIPE DRY with a chamois or soft cloth.
- Carefully CLEAN the joints and flanges of the slideout, doors, etc. where dirt is likely to remain.

**AVOID forcing water inside the RV.
This could damage component parts.**

EXTREME CAUTION should be used with any type of pressure sprayer around all attachments, doors, windows, appliance vents, etc.

NOTE: Some types of hot water washing equipment apply HEAT and HIGH PRESSURE to the RV.

Excessive HEAT - can cause distortion or damage to resin parts.

Excessive PRESSURE - can flood the RV's interior.

- DO NOT take your RV through automatic car washes.
- **DO NOT use a direct high pressure spray on any Decals, Graphics, or Labels.**
- Keep the washing nozzle about 16 inches (40 cm) or more away from the RV body.
- When washing around the door, vent and glass areas, hold the nozzle at right angles to the surface.
- If chalking occurs, first wash and wax a small area to see if the luster returns.
- Have your dealer inspect the RV if the exterior becomes scratched, nicked or cracked.

During cold weather

IF the slideout or door is frozen shut, opening it by FORCE may tear off or crack its rubber gasket and ruin the weatherproof seal.

1. *INSTEAD*, pour warm water on the gasket to melt the ice.
2. *Then*, AFTER opening the slideout or door, wipe off the water thoroughly.
3. To prevent the weather stripping from freezing, treat it with a silicone spray.
4. **Salt and other chemicals spread on winter roads can have a detrimental effect on the RV's underbody.**
 - **If your RV is exposed to these conditions:**
 - WASH the exterior of your RV and carefully spray the underbody with a high-pressure hose, *and*
 - REMOVE any mud or debris that could trap/hold salt or moisture.
 - After washing your RV, WIPE OFF all water drops from the rubber parts around the slideout and doors.

NOTICE

DO NOT use a buffer and a buffing compound as it may damage the exterior surface. Please contact a professional paint body shop for assistance.

NOTICE

DO NOT use waxes containing high-abrasive compounds. Such waxes remove rust and stains effectively, but they are also harmful to the luster of the surface, since they may scrape off the coating. Further, they are detrimental to glossy surfaces, such as the grille, garnish, moldings, etc.

DO NOT use gasoline or paint thinners to remove road tar or other contamination to the painted surface.

NOTICE

DO NOT allow plastic to come into contact with brake fluid, engine oil, grease, paint thinner, or battery acid. These will damage plastic.

Use a soft cloth and a mild detergent solution to wipe away any such contact.

Cleaning the Exterior, Continued

Waxing your RV

Wax your RV once or twice a year, or when painted surfaces do not shed water well. Use a soft cloth to apply a small amount of wax to the painted surfaces. After the wax has dried, polish the RV with a dry, soft cloth.

- DO NOT wax your RV in direct sunlight. Apply wax only when the surfaces of your RV are cool to the touch.
- DO NOT apply any wax on the weatherstrip around the RV's various openings. If it is stained with wax, the weatherstrip cannot maintain a weatherproof seal.
- DO NOT apply wax to **Decals, Graphics, or Labels**.
- DO NOT apply wax to any area with a flat black finish as it can cause discoloration.

If the finish has been stained with wax:

- WIPE OFF the area with a soft cloth and warm water.

Polishing your RV

If painted surfaces have been severely damaged and have lost their original luster and color tone, polish the surface lightly with a fine polishing compound. Avoid limiting your polishing to the damaged surface only; polish a somewhat wider area, moving the polishing cloth in one direction. After polishing, flush the compound from the surface and apply a coat of wax to regain a beautiful luster.

Damaged paint

TOUCH UP small cracks and scratches in the paint coat of the TT front cap as soon as possible with touch-up film or paint. Carefully check the body areas facing the road and the tires for damage to the paint coat caused by flying stones, etc. To purchase touch-up paint, use the closest automotive paint match available locally. See **page 146**, *Trailer Frame*.

Chrome parts

To prevent chrome parts from spotting or corroding, WASH with water, DRY thoroughly, and APPLY a non-abrasive automotive wax. If the chrome is severely damaged or pitted, use a commercially available chrome polish product.

Cleaning plastic parts

Use a sponge or chamois to clean plastic parts. Use warm water and a soft cloth or chamois to remove any white residue from dark colored plastic surfaces. DO NOT use a scrubbing brush or other hard tools as they may damage the plastic surface. DO NOT use wax containing abrasives that may damage the plastic surface.

Exterior Roof

To Maintain Your Roof Warranty:

PLEASE NOTE: ONLY THE CORRECT, RECOMMENDED ALPHA SYSTEMS SEALANTS SHOULD COME IN CONTACT WITH YOUR ALPHA ROOF MEMBRANE. (See below)

With the SuperFlex Roof Membrane - Use ONLY:

- **1010 Non-Sag Sealant, and**
 - **1021 Self Leveling Sealant.**
1. **INSPECT all roof sealant every three (3) months for voids, gaps and cracks, then RE-SEAL as needed.**
 2. **WASH the roof membrane with water and a mild detergent 3-4 times per year, CLEAN & INSPECT the roof vents.**
 - **DO NOT use solvents during cleaning.**
Solvents can damage existing sealant and may weaken plastic roof components.
 - **DO NOT use sharp tools (putty knife) that could puncture the roof membrane.**
 - If any voids or cracking are found, remove any loose sealant *by hand*.
 - If the *loose sealant* cannot be pulled off by hand, then it still has good adhesion to the roof membrane and should be left alone.
 - Using a medium-bristled scrub brush, CLEAN all areas to be resealed with a non-abrasive household cleaner, such as Top Job® or Spic-N-Span®.
 - This area **must** be dry before continuing.
 3. **APPLY a generous amount of the correct Alpha Systems sealant over the top of any existing sealant in the area being resealed.**
 - Use Self-Leveling Sealant on *horizontal* surfaces.
 - Use Non-Sag Sealant on *vertical* surfaces.

Sidewall Vents

Water heater, furnace and exterior doors need to be kept clean and free of obstructions while the appliances (if so equipped) are in use. Inspect all exterior vents for blockages from bird or insect nests, spiderwebs, leaves, etc.

WARNING

As with the surface of any roof, a rubber roof can be very slippery, especially when wet. If you go up on your roof we recommend extreme caution and suggest that you navigate the roof on your hands and feet. This distributes the weight more evenly and helps reduce the possibility of falling.

NOTICE

Failure to properly maintain or re-seal your RV may result in serious water damage to the roof and other parts of the RV.

This damage is not covered by the Limited Towable Base, Limited Towable Structural, or Limited Towable Frame Warranties.

NOTICE

DO NOT use petroleum distillates to clean the roof as they may cause permanent damage.

 **WARNING**

If your RV is equipped with a roof ladder:

- DO NOT exceed the weight limit of 300 lbs.
- DO NOT leave items attached to ladder while traveling.

Sealants

Sealants perform a very important function and should be inspected closely and regularly maintained. We incorporate many different types of sealants, including butyl/putty, black butyl-encapsulated foam, silicone (clear and colored), roof sealant and foam. In general, sealants do not have a "set" lifetime. Varying environmental factors affect the pliability and adhesiveness of sealants.

Sealants may become damaged due to exposure to the elements, freezing temperatures, ultraviolet, and air pollution. If deteriorated, repair immediately to prevent damage. A quick walk around the RV before leaving may help prevent potential problems during trips and vacations. Your dealer service or parts manager can help you obtain the correct sealant(s).

You or your dealer **MUST:**

- **INSPECT all sealants, every three (3) months.** CHECK the roof and all four sides of the RV including all moldings, doors, vents and exterior attachments.
- REPLACE the sealant if you notice any cracks, peeling, voids, gaps, breaks, looseness or any sign of physical deterioration.
- RESEAL at least one time each year as preventative maintenance. Always use the same type of sealant that was removed.

If you notice water inside the RV, immediately have the dealer check for the source of the leak.

- **Failure to correct the leak may result in serious damage to your RV; this damage may not be warrantable.**

If you have questions and/or need assistance with sealing your RV, consult with your RV dealer.

Solar Panels

CLEANING

Although Go Power! Solar Kits are generally maintenance free, significant performance gains can be made with clean solar panels.

1. Clean the solar panels monthly. Use water and a soft sponge or cloth. A mild non-abrasive cleanser can be used for more stubborn residue. Rinse well.
2. Clean solar panels more frequently during drier months, as they may become covered in dust more quickly. A pressure washer is not recommended.
3. Visual inspection - check the exterior for cracks, missing or broken hardware or other potential problems. Check all roof penetrations and replace sealant areas as required.

LONG TERM STORAGE - RV

In Cold Climates (temps below 32°F):

- Cover your solar panels with a protective material that does not allow light to pass through. We recommend using a dark-colored tarp or plywood, with plywood being the best option.
- Label your solar panel wires "positive" and "negative" Unhook your solar panels from your solar controller.
- Fix wire nuts on the positive and negative leads from the solar panels.
- Disconnect your batteries and store them inside in a warm, dry place preferably off the floor on something like a wooden pallet.
(AGMs can handle temps lower than 20°F)
- Check the batteries monthly and charge them if necessary.

NOTICE

DO NOT add items to the RV rear bumper. Add-on items will eventually damage your bumper. Damage caused by such aftermarket equipment installation or improper loading voids the Limited Towable Base, Limited Towable Structural, and Limited Towable Frame Warranties.

Rear Bumper

- **The rear bumper of your RV is NOT designed to carry cargo.**
- Extra weight behind the trailer's axles may *reduce* the **Hitch Weight** (leading to adverse handling conditions from wind gusts and passing traffic).
- Items that extend beyond the bumper will place undo strain on the bumper.
- Over time, weight added to the bumper will cause damage from the motion created while traveling.

Trailer Frame

Rocks, sand, road debris, climate (like salt air exposure) and especially the ice inhibiting chemicals used during the winter months will damage your frame's painted exterior, inviting rust and other deterioration.

- Regularly inspect all exposed areas of the frame.
- To maintain protection, **clean** and **repaint** any chipped areas or rust spots.

Windows

Any ventilating window may permit water inside, especially during heavy rainstorms. Condensation will also cause water to accumulate on windows and in the tracks. Normally the window glass can be cleaned with a sponge and water.

- Use *glass cleaner* to remove wax, oil, grease, dead insects, etc.
- After washing the glass, wipe it dry with a clean, soft cloth.

Winterizing / RV Storage Preparation

To help prevent problems, prepare your RV for extended periods of non-use. This will also make it easier to get your RV ready for the next camping trip or season.

- **In colder climates, BEFORE storing for the winter, be sure your RV's plumbing system is properly Winterized to prevent costly freeze-ups.**
1. CHECK your roof and other surfaces for any damage or potential leaks that could go unnoticed until it is too late.
 2. CLOSE all windows and roof vents.
 3. TURN OFF 12-volt DC to the refrigerator; defrost and clean.
 4. USE crumpled newspaper or open boxes of baking soda in the refrigerator to eliminate odors during storage.
 5. SHUT OFF the propane cylinder valve(s).
 6. COVER all external outlets/vents (furnace, exhaust, etc.) to prevent mice or other rodents from entering.
 7. COVER the roof air conditioner (if so equipped).
 8. DISCONNECT 120-volt AC power to the RV.
 9. DO NOT use the leveling legs during storage.
 10. DRAIN all water lines.
 11. FLUSH, *then* DRAIN **ALL** holding tanks; fresh water, grey water, black water and the water heater.
 12. DISCONNECT the battery cables from the auxiliary battery terminals & REMOVE all batteries from the RV.
 - **Store batteries in a place where they will not freeze.**
If a battery is frozen, it will no longer hold a proper charge.
 13. WASH the interior and the exterior of your RV thoroughly.
 14. STORE your RV indoors, under a roof or purchase a *breathable* cover for use during storage.
 15. TO PREVENT weather checking and other UV damage, cover tires that are exposed to sunlight.

Snow removal

During the storage period, remove snow from the roof of your RV to prevent damage to the unit's structure.



Please review the winterizing instructions for your water heater in both the Plumbing Section of this manual, and the water heater's manufacturer owner's manual.



Damage from birds, rodents, insects, etc., is not covered under the Limited Towable Base, Limited Towable Structural, or Limited Towable Frame Warranties applicable to your RV.

NOTICE

Excessive snow, 8" or more, or ice, 2" or more, places excessive weight on the RV roof. Remove excessive snow or ice as needed. Care **MUST** be exercised to not damage the roof material when removing snow & ice. Excessive weight can damage the roof, seals, etc. Water leaks and poor fit or operation are the results of this damage.

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Maintenance

Suggested Maintenance Checklist

Here is a quick reference list of suggested areas for regular maintenance. Review all manufacturer's operators manuals supplied with your RV to perform the maintenance items listed.

Prior to first trip:

- INSPECT and reseal as needed.
- HAVE YOUR DEALER CHECK the propane system for leaks.
- CHECK that wheel lug nuts are tightened to the required torque specification, RE-TORQUE after 50-100 miles.
- SANITIZE the fresh water system.
- TEST all safety alarms.

First two hundred miles:

- CHECK that wheel lug nuts are tightened to the required torque specification.
 - RE-TORQUE as needed.
- HAVE a certified *Service Technician* adjust the brakes.

Each trip:

- INSPECT and reseal as needed.
- CHECK the auxiliary battery.
- CHECK running lights.
- CHECK tire pressure and wear, including spare.
 - *The tires should be COLD when checking the tire pressure.*
 - *See **page 44**, Steps for maintaining proper tire pressure.*
- CHECK wheel nuts at specified intervals to the listed torque values. RE-TORQUE as needed.
 - *See **page 50**, Wheel Nut Torque & Wheel Torque Requirement Table.*
- TEST the brakes.
- TEST all safety alarms.

Required Maintenance

Required Maintenance Schedule							
Maintenance Item	Every trip	Monthly	Every 3 months	Every 6 months	Annually	Before /After Storage	<p>Procedure to be Performed:</p> <p>Maintenance schedules are <i>minimum</i> requirements. Extended use, extreme temperatures, high humidity or other extreme conditions will require more frequent maintenance.</p>
Appliances					●	●	Check settings & adjustments per manufacturers guide.
		●				●	Make sure burner tubes /vents are clean /unobstructed.
					●	●	Clean & sanitize.
Awnings						●	Wash with warm water and mild detergent.
					●	●	Clean moving parts & apply Silicone or Teflon based dry lube.
Axles / Suspension						●	Check U-bolts, springs & hangers for damage.
					●	●	Check torque - all bolts (<i>see mfg. guide for specs</i>).
			●				Inspect and lube wet bolts with a "squirt" of grease every 3 months (quarterly).
Baggage Doors		●				●	Confirm that doors seal tight and are not leaking.
			●			●	Spray lock tumblers with dry graphite.
Brakes / Wheel Hubs					●		Have brakes and hubs inspected by a certified RV service technician.
					●		Check amp draw / shoe wear / adjustment (<i>see mfg. guide for specs</i>).
					●		Lube bearings every 12 months (<i>as required</i>).
Electrical System	●		●			●	Check and service batteries.
			●		●	●	Test all GFI outlets.
					●	●	Service generator (<i>if equipped</i>) per manufacturer's manual.
Entry Door(s)	●					●	Make sure door latches and locks function properly.
			●			●	Lube hinges with Silicone or Teflon based dry lube.
			●			●	Adjust screen door and latch.
Emergency Egress Window(s)	●	●				●	Open and close the <i>Emergency Egress Window(s)</i> every trip.
Entry Steps				●		●	Clean & apply Silicone or Teflon based dry lube.
Exterior Fiberglass / Metal			●			●	Wash with warm water & mild detergent.
				●			Apply non-abrasive wax (<i>except on decals</i>).
Exterior Moldings			●			●	Inspect sealant for voids / gaps / cracks and re-seal as necessary.
Frame / Underbelly					●	●	Check for damage, loose wires and debris. Clean as necessary.
			●			●	Check frame for chipped paint and rust, repaint as necessary.

Required Maintenance Schedule							
Maintenance Item	Every trip	Monthly	Every 3 months	Every 6 months	Annually	Before/After Storage	Procedure to be Performed: Maintenance schedules are <i>minimum</i> requirements. Extended use, extreme temperatures, high humidity or other extreme conditions will require more frequent maintenance.
Hitch / Coupler					●	●	Check for damage and wear. Clean and Lubricate (with grease).
LP System					●		Have system tested for leaks by a certified dealer.
					●		Have pressure and regulator setting checked by a certified dealer.
Plumbing System			●		●	●	Check hoses, fittings and pipes for leak. Tighten as required.
					●	●	Lubricate termination gate valve cables with Silicone or Teflon based dry lube.
					●	●	Winterize system before storage (<i>in cold weather locations</i>).
	●				●		Drain Fresh Water Holding Tanks after every trip. Sanitize Annually (<i>or as needed</i>).
	●						Drain & Flush Black & Grey Water Holding Tanks.
Roof And Roof Attachments			●			●	Inspect sealant for voids / gaps / cracks and re-seal as necessary.
				●		●	Clean roof with water and mild detergent.
					●	●	Clean and lube roof vent mechanisms with light oil.
Safety Equipment	●			●		●	Check operation of detectors - recharge and replace batteries every 6 months if equipped.
				●	●		Test and check fire extinguisher for proper charge.
	●	●				●	Test and confirm <i>Emergency Egress Window(s)</i> function properly.
Slide Rooms					●		Slideout room adjustment performed by a certified RV service technician.
	●						Check slide roof for debris - clear as necessary.
	●		●			●	Check and clean all seals.
Wheels & Tires	●		●			●	Check wheel lugs for proper torque.
			●			●	Inspect tires for wear / damage / etc.
	●	●				●	Check tire inflation pressure (<i>see tire label for pressures</i>).



Basic Troubleshooting

Air Conditioner (Roof)

Will not operate

- CHECK that the unit is turned ON.
- CHECK circuit breakers in coach.
- Have a certified technician CHECK & CONFIRM that 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 certified 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.
- CHECK that the outside coil is not blocked or damaged.
- Have a certified technician CHECK & CONFIRM that you have the proper voltage.

Should your air conditioner still not work after completing the above checks, contact a certified service facility to perform more extensive testing.

Electrical Power

No AC power to RV

- CHECK circuit breakers at power center.
 - The 120-volt circuit breaker may be OFF or *tripped*.
- Have a certified technician CHECK & CONFIRM 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 furnace fuse in fuse panel. REPLACE if necessary.
- CHECK that the return air grill is unobstructed.
- CHECK that no items are stored in the furnace compartment.
- CHECK that all heat outlet registers are open *and* unobstructed.
- CHECK that 12-volt power is present.
- CONTACT your dealer if the problem persists.

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 ON timer.
- NO POWER to oven.
 - CHECK power supply and circuit breaker.

WARNING

DO NOT attempt to repair or adjust the furnace.

Turn off the thermostat and furnace gas control valve, then contact your dealer or authorized service center.



Furnace w/Outside Panel Removed

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 dealer or certified 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 a solution of two-parts vinegar mixed to one-part water.

Propane indicator display indicates E or F all the time

- CHECK that the propane gas tank is full.
- If display reads **F**, check the wiring or sending unit for malfunction.
- Have it inspected by a certified technician.

Outside Receptacle

No power to outside receptacle

- CHECK that you have power to the shoreline.
- CHECK breaker on generator.
- GFCI receptacle switch may be OFF or *tripped*.
 - Re-Set GFCI at receptacle in bathroom or kitchen.
- CHECK the breaker in the power center or panel box.
- CONTACT a dealer or a certified 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 or 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.

Range or oven burner won't light or stay lit

- CHECK position of top burners and flash tubing.
- CLEAN clogged burner ports with a toothpick.
- *See the oven manufacturer's instructions for proper care and maintenance.*

Gas smell

- CHECK all connections with leak detector solution.

Food burns on the bottom

- Oven too full for proper circulation. Use smaller pans or put less food in the oven.

Portable Generator (Customer Supplied)**Starter engages while holding down the start button, but generator does not start**

- Generator may be out of fuel.
 - Generator will not operate when the fuel tank is less than $\frac{1}{4}$ full.
- Generator may be low on oil. CHECK the oil level.

When the generator start button is pushed, nothing happens

- CHECK that the battery disconnect switch button is pushed.
- CHECK 12-Volt fuse on generator.
- RESET circuit breaker if necessary.
- CONTACT your dealer or a certified 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 just makes clicking sound when trying to start

- Battery condition may be low. RECHARGE if necessary.
- CHECK for poor ground or battery connection.

 **DANGER**

IF YOU SMELL
PROPANE GAS
STOP!

Quickly and carefully
perform the 6-step
procedure in the red box.

 **WARNING**

WORKING WITH PROPANE
CAN BE DANGEROUS.

Always have repairs to your
LP system performed by
your dealer or a certified
professional.

Propane Gas

Smell gas in or around unit

- Propane tanks may be overfilled.

IF YOU SMELL PROPANE

1. **EXTINGUISH** any open flames, pilot lights *and* all smoking materials.
2. **DO NOT** touch electrical switches.
3. **SHUT OFF** the propane supply at the container valve(s) or propane supply connection.
4. **OPEN** doors and other ventilating openings.
5. **LEAVE THE AREA** until odor clears.
6. Have the propane system **CHECKED** and leakage source **CORRECTED** before using again.

**FAILURE TO COMPLY COULD RESULT IN AN EXPLOSION
RESULTING IN DEATH OR SERIOUS INJURY**

Refrigerator, 12-Volt

The control panel lights are not illuminated

- CHECK coach circuit breakers and GFCI receptacle.

Lights are illuminating, but no cooling

- Use a proper power source that is available and cooling operation to specification.
- CHECK the refrigerator unit is level.
- ALLOW sufficient time for proper cool down and load with food that is *already* cold.
- Have a certified RV technician CHECK the fuses in the black electrical box on the rear of the refrigerator.

Heavy frost buildup on the evaporator fins

- Defrost the freezer and refrigerator.
- Have the refrigerator checked by your dealer or a certified RV technician.

Running Lights

Running lights not working

- Running lights not working.
 - **Blown fuse** - Replace with a new fuse.
Replacement fuse must have the same amp rating.
 - **Bad bulbs** - Replace the bulbs with new.

Stabilizing System, BAL SS 5.1

- The stabilizing system should be inspected a minimum of twice per year (once before starting the camping season and once before storing the unit).
- Clean jacks of dirt, and lubricate as needed.
DO NOT use a high pressure washer to clean any of the components.
- With the tongue jack extended half way, remove the plastic plug (*Fig. 5*) and apply a small amount of grease to the screw.
- With the stabilizer jacks extended so that they are about an inch from the ground, apply some grease to the screw between the motor coupler and the trunnion nut (*Fig 6*).

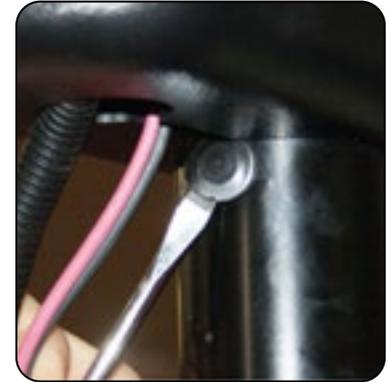


Fig. 5



Fig. 6

Slideout

Room moves in and out very slowly, binds or squeaks

- Lubricate the slideout 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.
- CHECK weep hole in ramp pan is OPEN and UNOBSTRUCTED.

Room will not move in or out

- CHECK the auto-resetting fuse located by the slideout 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

- IT IS NORMAL for the slideout rollers to compress the nap of the carpet since they carry considerable weight. Raking the nap or vacuuming will solve this problem.

Termination Valve

Termination valve leaks

- Debris keeps valve from seating. CLEAR debris from and around valve O-ring set.
- Bad gasket. Have your dealer or certified RV technician replace gasket with new.

TV Antenna

Poor TV reception

- Antenna Power switch is OFF. Turn ON power switch.
- Bad connections at TV or wall plate. Make sure the connections are good at both TV and wall plate.
- Cut or torn cable. Have your dealer or certified RV technician replace bad cable where needed at TV and antenna.

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 RV toilet paper.
- ALWAYS use plenty of water when flushing.
- CHECK termination valve for proper operation.

Water Heater, Furrion Tankless

- See *Troubleshooting* in the manufacturer's user manual found in the *Owner Information Package*.

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:

1. TURN OFF your main water supply; that is, your pump or your water hookup source.
2. DRAIN your water lines and water heater.
 - *Drain & Blow Out Water Lines, then*
 - *Drain & Blow Out Water Heater.*
 - *See **page 88**, *Winterizing the Furrion Tankless Water Heater & Plumbing System.**
- If the water drains slowly or sporadically (instead of flowing freely), OPEN the *Pressure Safety Valve* to allow air into the line.
3. AFTER completely draining, FLUSH the entire system with a solution of 2-parts vinegar / 1-part water, from the *water inlet* all the way to the *holding tank*.
4. If you decide to use air pressure (30 PSI max.), it may be applied through the *City Water* inlet.
 - 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 the water heater with fresh water. Water should be pumped into the lines with the assistance of the on board water pump or with the assistance of external water pressure.
5. 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.
6. AFTER steps 1-5 (above) are complete, CLOSE the drain plug *and* the *Pressure Safety Valve*. FLUSH the lines with fresh water.

If you use your vehicle frequently or for long periods of time, flushing the lines several times a year will prolong the life of the water heater.

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.

Pump will not prime, sputters (no discharge, but the motor runs)

- CHECK that there is a sufficient amount of fresh water,
 - Use the *Monitor Panel* to check the fresh water tank fill level.
- CHECK that there is not trapped air 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.
- INSPECT toilet for leaky valves.
- Have the pump checked by your dealer or a certified RV technician.

Water System

A leak in the water lines is frequently identified by wet areas near fresh water connections, or if the water pump is running while the faucets are closed and no water is being used.

To repair a possible leak:

- DO NOT *over-tighten* fittings as this may cause additional leakage.
1. CLOSE all low point water drains and tank drains.
 2. TURN OFF all fixtures.
 3. CHECK all fixtures and connections for tightness.

Appendix A: Notice to California Owners

California Residents

At least 30 days prior to commencing a legal action seeking civil penalties, you must provide a notice to Grand Design RV, LLC that includes the following information. You must also own and be in possession of the recreational vehicle at the time that the notice is sent. The notice must include:

1. Your name
2. The Vehicle Identification Number of the recreational vehicle that you own
3. A brief summary of the repair history and alleged problems with the recreational vehicle
4. A demand that Grand Design RV, LLC either repurchase or replace the recreational vehicle

You must send this notice to:

- If by email to: GDRV_CA@granddesignrv.com
- If by mail, by certified or registered mail, return receipt requested to:

Grand Design RV, LLC
5200 Hoffman St.
Elkhart, IN 46516
Attn: Consumer Affairs

Please also send a copy to (not a requirement):

Winnebago Industries, Inc.
13200 Pioneer Trail
Eden Prairie, MN 55347
Attn: Legal Department

Residentes de California

Al menos 30 días antes de iniciar acciones legales en busca de sanciones civiles, debe dar un aviso a Grand Design RV, LLC que incluya la siguiente información. También debe ser propietario y poseer el vehículo recreativo en el momento en que se envía el aviso. El aviso debe incluir lo siguiente:

1. Su nombre
2. El número de identificación del vehículo recreativo que posee
3. Un breve resumen del historial de reparaciones y presuntos problemas con el vehículo recreativo
4. Una demanda de que Grand Design RV, LLC vuelva a comprar o reemplace el vehículo recreativo

Debe enviar el aviso a:

- Por correo electrónico a: GDRV_CA@granddesignrv.com
- Si lo envía por correo postal, por correo certificado o registrado, se solicita acuse de recibo a

Grand Design RV, LLC
5200 Hoffman St.
Elkhart, IN 46516
Attn: Consumer Affairs

Envíe una copia a (no es un requisito):

Winnebago Industries, Inc.
13200 Pioneer Trail
Eden Prairie, MN 55347
Attn: Legal Department

Glossary

Grand Design RV's Glossary of RV Terms and Slang
is available for download with the QR Code below.



SCAN the **QR Code**, above, with the camera
on your smartphone or tablet to download the
GDRV Glossary of RV Terms & Slang.

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Customer Notes

Customer Notes

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Corporate Office
11333 County Road 2
Middlebury, IN 46540
USA

(574) 825-8000
www.granddesignrv.com