



Made to fit.

OWNER'S MANUAL

Class A and Class C Motorhomes



WARNING

Operating, servicing and maintaining a passenger vehicle or off-road vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle.

For more information go to: www.P65Warnings.ca.gov/passenger-vehicle



Made to fit.

Congratulations on purchasing your new Thor Motor Coach Recreational Vehicle!

We sincerely thank you for choosing and putting your faith in us. Our goal is to provide you with a quality motorized recreational vehicle at a reasonable price.

Your motorhome was built following the high standards set by Thor Motor Coach (TMC), the Recreational Vehicle Industry Association (RVIA), and (if applicable) the Canadian Standards Association (CSA) as well as complying with the requirements of all applicable state and federal agencies.

Your motorhome is designed to provide you with carefree, comfortable travel and vacationing. Our hope is to provide you with many years of enjoyment and great memories.

Our customers are extremely important to us, and we want to assure you that we will always strive to do everything possible to continue to earn your trust and goodwill.

Welcome to the wonderful world of RVing and to the Thor Motor Coach family.

Happy Travels!

Made to fit.

PO Box 1486 • Elkhart, Indiana 46515 - 1486 • (Toll Free) 877.855.2867 • thormotorcoach.com

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Thor Motor Coach (TMC) reserves the right to make changes in vehicles built and/or sold at any time without incurring any obligations to make the same or similar changes on vehicles previously built and/or sold by TMC. Information in this owner's manual is subject to change without notice and represents information relevant at the time this version was printed. Nothing in this owner's manual creates any warranty, either expressed or implied. The only warranties offered are those set forth in the Thor Motor Coach Limited Warranty and in the Thor Motor Coach Structural Limited Warranty, as applicable to the motorhome.

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Introduction

INTRODUCTION

About This Owner's Manual

Thank you for choosing Thor Motor Coach (TMC). This Owner's Manual is intended to help you better understand the features and general operation of your new motorhome. Please read and keep it, your TMC Warranty Guide, your Owner's Packet, and your Chassis Packet in your recreation vehicle (RV) for future reference.

This Owner's Manual is not intended for use as a service manual, but rather as a guide to help you become familiar with your motorhome. It is not model specific and is of a general nature so the illustrations and descriptions provided may differ from the components installed in your motorhome.

TMC Warranty Guide

The Thor Motor Coach Limited Warranty and the Thor Motor Coach Structural Limited Warranty are printed separately in your TMC Warranty Guide. The TMC Warranty Guide also contains your TMC Product Warranty Registration Form (this form must be completed by you and your selling dealer, and returned to us within fifteen (15) days of delivery of your new motorhome to you).

Owner's Packet

For more complete instructions regarding warranty, safety, operation, and maintenance of the component supplier parts installed in your motorhome, please read and follow the information provided by the various component manufacturers located in your Owner's Packet. If you feel you are missing component supplier information, please contact the component manufacturer using the supplier contact list provided in your TMC Warranty Guide, your selling dealer, or TMC Customer Care at [\(877\) 855-2867](tel:8778552867).



TMC Owner's Packet

Chassis Packet

The Chassis Packet contains important warranty, safety, operation, and maintenance information from the manufacturer of your motorhome chassis regarding the transmission, tires, etc. Instructions for registering your applicable warranty using the chassis manufacturer's Delayed Warranty Start Form are printed separately in the TMC Warranty Guide.

Online Customer Support

A good working knowledge of your motorhome and how to care for it will help you enjoy many miles and years of RVing. As an added bonus, we have provided informational 'how-to' videos on our Thor Motor Coach YouTube channel:

<https://www.youtube.com/user/ThorMotorCoach>

and more information available in the Owner's Resources section of our website:

<https://www.thormotorcoach.com/owners/>

Contact

If you are unclear or unfamiliar with any procedure described in this Owner's Manual, your TMC Warranty Guide, Owner's Packet, Chassis Packet, or online Customer Support information, please contact your selling dealer or TMC Customer Care at (877) 855-2867 for assistance.

Customer Information

CUSTOMER INFORMATION

Dealer's Responsibilities

Your selling dealer is responsible for inspecting both factory and dealer installed components for proper operation. This is referred to as a PDI (pre-delivery inspection).

1. Your selling dealer is required to provide a thorough and complete walk through demonstration and perform a test drive with you. The demonstration should provide you with a good understanding regarding your new motorhome warranty, safety information, operation, and maintenance.
2. Your selling dealer should discuss this Owner's Manual, the Owner's Packet, the Chassis Packet, and the various individual component supplier documents with you at the time of sale. Their presentation should include assisting you with completing all warranty cards and registrations, and reviewing all individual component supplier information, including warranty, safety, operation, and maintenance information relating to your new motorhome.
3. Your selling dealer is required to complete and return the TMC Product Warranty Registration Form (located in the TMC Warranty Guide) to Thor Motor Coach within fifteen (15) days of delivery of your motorhome to you to activate your Thor Motor Coach Limited Warranty, and your Thor Motor Coach Structural Limited Warranty coverage.

Customer's Responsibilities

You, as the owner/operator of the motorhome, are responsible for providing proper maintenance as outlined in this Owner's Manual, the TMC Warranty Guide, the Owner's Packet, our On-line Customer Support, the Chassis Packet, and all individual component suppliers' information. Periodic maintenance is not covered by the Thor Motor Coach Limited Warranty and/or the Thor Motor Coach Structural Limited Warranty.

1. Read the Thor Motor Coach Limited Warranty and the Thor Motor Coach Limited Structural Warranty before you purchase your motorhome. If you have questions regarding coverage, contact TMC Customer Care at [\(877\) 855-2867](tel:877-855-2867).
2. Inspect the entire motorhome during your PDI and test drive, and note any issues in writing on the TMC Product Warranty Registration Form. Ask any questions you may have before leaving the selling dealership.

NOTE: Your applicable Thor Motor Coach Limited Warranty and Thor Motor Coach Structural Limited Warranty are activated after we receive your fully completed TMC Product Warranty Registration Form from your selling dealer.

NOTE: Failure to properly maintain your motorhome could result in loss of warranty coverage.

3. Complete and return all applicable warranty cards and registrations at the time of sale.
4. Regular and proper maintenance. Be sure to have service performed in a timely manner to help avoid situations arising from neglect or abuse that are not covered under warranty.
5. Familiarize yourself with your new motorhome.

Follow all TMC, chassis manufacturer, and all individual component suppliers' instructions regarding the safety, operation, and maintenance of their respective products.

Change of Address or Ownership

The 'National Traffic and Motor Vehicle Safety Act of 1966' in the United States, and Transport Canada require manufacturers to be able to contact vehicle owners when a correction of a safety-related defect or noncompliance issue becomes necessary.

To enable TMC to contact you (the current purchaser) with important vehicle product and safety updates, including vehicles with expired warranty coverage, please update your vehicle-related or ownership information by contacting TMC in writing by faxing (574) 294-3618 (attention: Registrations), or by emailing registrations@tmcrv.com.

INCLUDE THE FOLLOWING:

- Your legal name
- Your current mailing address (include your prior mailing address for change of address notifications)
- Your telephone number
- Your email address
- Your vehicle's 17-digit chassis vehicle identification number (VIN)
- Your vehicle's TMC serial number
- Legal proof of purchase (e.g., a legible copy of your bill of sale or insurance card)
- Current motorhome odometer reading

How to Obtain Assistance

Should a question or concern arise regarding your motorhome, your first step is to contact your selling dealer. Their sales, service, and parts professionals will be glad to assist you. Customer service is of the utmost importance to your selling dealer, and is just as important to us.

You can also contact a TMC Customer Care representative, by calling [\(877\) 855-2867](tel:877-855-2867). Questions can also be directed to TMC Customer Care through the Thor Motor Coach website. To access this service, you must have a valid email address. This resource is available to you 24/7. You will receive a reply by email, or if you choose, a TMC Customer Care representative will return a phone call as soon as possible.

We sincerely believe your selling dealer and your TMC Customer Care representative will be able to solve any concern which may arise. However, if their combined efforts are not satisfactory please send a letter describing the circumstances to:

**Thor Motor Coach
Attn: Customer Care
PO Box 1486
Elkhart IN 46515-1486**

INCLUDE THE FOLLOWING:

- Your selling dealer's name, address, and phone number
- Your dealer contact's name
- Your legal name, current mailing address, phone number, and email address
- Your vehicle's 17-digit chassis vehicle identification number (VIN)
- Your vehicle's TMC serial number
- Current motorhome odometer reading
- If applicable, include the individual component supplier's name, part description, model number, and serial number

Suggestions for Obtaining Service

To help ensure your selling dealer provides the level of service you expect, here are some suggestions we would like to make:

CONTACT YOUR DEALER AT ONCE

Do not wait until you are ready to use your motorhome. Service appointments are made based on each dealer's schedule, so contact your dealer as soon as possible to have repairs performed.

PREPARE FOR THE APPOINTMENT

If you are having warranty work performed, be sure to have the right papers with you. Take your warranty folder and have your vehicle information available. All work to be performed may not be covered by warranty. Discuss additional charges with the dealer's service professionals.

PREPARE A LIST

Provide your dealer with a written list of specific repairs needed. It is important that you provide any vehicle repair history to the dealer's service professionals. Keep a maintenance log of your vehicle's service history. This can often provide a clue to the current issue.

BE REASONABLE WITH YOUR REQUESTS

If you leave a list with several items, and you need your motorhome returned back by a specific time, discuss the situation with the dealer's service professionals and list your items in order of priority. This may include making a second appointment for work not completed or parts that the dealer may need to order.

DON'T EXPECT TO LOOK OVER THE TECHNICIAN'S SHOULDER

Please don't be offended if you are told you cannot watch the work being done. Some insurance requirements forbid admission of customers to the service area.

INSPECT THE WORK PERFORMED

Finally, check out the service or repair job when you pick up your motorhome. Notify the dealer's service professionals immediately of any dissatisfaction. If you cannot return the vehicle immediately for repair, make an appointment as soon as possible.

Please be aware that all service shops require notification of any issues with their repairs within a specified time limit. Make sure you are familiar with their repair policies.

Emergency Weekend or After Business Hours Warranty Repair Assistance

In an emergency, if an authorized TMC dealer is not located nearby please contact your selling dealer for assistance. If your selling dealer is closed, contact TMC Customer Care at [\(877\) 855-2867](tel:877-855-2867) (available 24/7) for warranty pre-repair authorization for emergency weekend and/or after business hours repair assistance.

Obtaining Service Repair at Thor Motor Coach

If your motorhome is in need of service repair, and your dealer recommends that the repairs be made at the TMC Factory Service Center, your motorhome may be returned to us with the following guidelines:

- You (the current motorhome owner) or your referring dealer must make a confirmed appointment prior to dropping off your motorhome.
- You are responsible for all transportation costs and hotel accommodations; please be prepared accordingly.
- Unless prior approval has been obtained from the TMC Factory Service Center, all personal items must be removed from the area where you are requesting service repair and the refrigerator emptied. TMC is not responsible for any lost or stolen property, valuables, or loss of food items.
- Your motorhome holding tanks must be emptied and rinsed. We have a dumping station available for customer use.
- The propane system and all electrical systems must be shut down and turned OFF. We are not responsible for discharged batteries or propane tanks.
- During the appropriate season, please ensure your motorhome is winterized.
- You must retake possession of your motorhome within seven (7) days of TMC notifying you that the repairs have been completed; otherwise, unless a longer storage time has been agreed to in writing by TMC, you agree to pay daily storage fees to TMC.

NOTE: Please refer to your TMC Factory Service Appointment Form for additional important information.

NOTE: Damage caused by use of your motorhome in freezing temperatures is not covered by the Thor Motor Coach Limited Warranty or the Thor Motor Coach Structural Limited Warranty.

Replacement Parts

TMC does not sell parts retail direct. Please contact your selling dealer for assistance in obtaining replacement parts or accessories. If the original part is no longer available, we will make every effort to provide an appropriate substitute.

Cold Weather Usage

When RVing in freezing or below freezing temperatures, these precautions should be taken:

- Make proper preparations to avoid freeze-ups of the fresh water and drainage systems.
- Propane gas and sufficient power is needed for protection from possible freeze-ups of the propane gas regulator.
- During cool weather usage, ventilation or addition of a dehumidifier (customer supplied) may be required to reduce condensation.
- To avoid damage, check the outside extrusions for frozen moisture before operating or using the motorhome compartment doors, locks, slideouts, windows, vents, etc.

Extended Stay Usage

Your motorhome was designed primarily for recreational use and short-term occupancy. If you expect to occupy the motorhome for an extended period, be prepared to deal with condensation and the humid conditions that may be encountered.

The relatively small volume and tight compact construction of modern RVs mean that the normal living activities of even a few occupants will lead to rapid moisture saturation of the air contained in the motorhome and the appearance of visible moisture, especially in cold weather.

Just as moisture collects on the outside of a glass of cold water during humid weather, moisture can condense on the inside surfaces of the motorhome during cold weather when relative humidity of the interior air is high. This condition is increased because the insulated

walls of a recreation vehicle are much thinner than house walls. Estimates indicate that a family of four can vaporize up to three gallons of water daily through breathing, cooking, bathing, and washing.

Unless the water vapor is carried outside by ventilation, or condensed by a dehumidifier (customer supplied), it will condense on the inside of the windows and walls as moisture, or in cold weather as frost or ice. It may also condense out of sight within the walls or the ceiling where it will manifest itself as warped or stained panels. Appearance of these conditions may indicate a serious condensation problem.

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

Thor Diesel Club

Discover a whole new level of camaraderie and increase your knowledge of your motorhome by joining the Thor Diesel Club. As the owner of a Class A diesel motorhome manufactured by Thor Motor Coach you are eligible for membership.

The Thor Diesel Club is an independently owned and operated entity that uses the Thor name under a license agreement. The Thor Diesel Club is not a principal or agent of Thor Motor Coach, Inc.

For more information regarding how you can become a club member, please contact:

Thor Diesel Club

5715 Hwy 85N #557

Crestview, Florida 32536

Website: www.thordieselclub.org

Email: thordieselclub@gmail.com

NOTE: Your motorhome is not designed, nor intended, for permanent housing. Use of your motorhome for long term or permanent occupancy may lead to premature deterioration of its structure, interior finishes, fabrics, carpeting, and/or window treatments, etc. Damage and/or deterioration due to long term occupancy is not considered normal, and may under the terms of the warranty constitute misuse, abuse, or neglect, and therefore void certain warranty protections.

NOTE: If you purchased a new qualifying motorhome, you may be eligible for a free one year of membership; please contact the management at Thor Diesel Club for more details.

Website Usage Disclaimers

Thor Motor Coach (TMC) hereby disclaims and sets forth as follows:

Website Disclaimer of Warranty

The services, information and materials on websites listed in this manual are provided "AS IS," and TMC shall have absolutely no liability whatsoever in connection with these website services, information, external links or third party links on these websites. Your use of these websites are at your own risk. TMC shall have no liability whatsoever for any errors, omissions or inaccuracies in the information regardless of how caused or for delays or interruptions in delivery of the information: or any decision made or action taken or not taken in reliance upon the information furnished.

TMC accepts no responsibility or liability whatsoever with regard to information on these websites as the information is meant to be of a general nature only and is not intended to address the specific circumstances of any particular individual or entity.

The information provided is not necessarily comprehensive, complete, accurate or up to date; the information is sometimes linked to external sites over which TMC has no control and for which TMC assumes no responsibility: TMC shall have no liability for any loss or injury caused, in whole or in part, by its actions, omissions or negligence, or for any contingencies beyond its control in procuring, compiling or delivering any information. The information is not professional nor does it comprise legal advice (if you need specific advice, you should always consult a suitably qualified professional).

Disclaimer of Endorsement

Any reference within external or third party links to any specific commercial products, process or service by trade name, trademark, manufacturer or otherwise, does not constitute or imply it's endorsement, recommendation or favoring by TMC. The appearance of external or third party links does not constitute endorsement by TMC of the linked web sites or the information, products or services contained therein. TMC does not exercise any editorial control over the information you may find at these locations. External or third party links may be provided for the convenience of the users of that website. TMC is not responsible for the availability or content of these external or third party sites and does not endorse, warrant or guarantee any products, services, information, centers or schools described or offered at these links.

Reporting Safety Defects

In the United States

If you believe that your recreation vehicle has an alleged defect that could cause a crash or cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) and Thor Motor Coach.

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

For additional information, go to the NHTSA website at www.safercar.gov.

To contact NHTSA by phone

Call the Vehicle Safety Hotline at [1-888-327-4236](tel:1-888-327-4236) and a NHTSA representative will record your complaint information (TTY: [1-800-424-9153](tel:1-800-424-9153) or [1-202-484-5238](tel:1-202-484-5238)).

To contact NHTSA by mail

Office of Defects Investigations/CRD
NVS-216
1200 New Jersey Ave. SE
Washington, DC 20590

To contact TMC by phone

Contact TMC Customer Care at [1-877-855-2867](tel:1-877-855-2867).

To contact TMC by mail

Thor Motor Coach
Attn: Customer Care
PO Box 1486
Elkhart, IN 46515-1486

In Canada

If you believe your recreation vehicle has an alleged safety defect, you should contact Transport Canada and Thor Motor Coach. Transport Canada prefers to be called instead of receiving posted mail or email, as it enables their investigators to confirm that your information is correct and to answer your questions accurately.

For additional information, go to the Transport Canada website at www.tc.gc.ca.

To contact Transport Canada by phone

Call **1-800-333-0510** (or **1-613-993-9851** if you are calling from the Ottawa region) and ask to speak to a defect investigator.

To contact Transport Canada by mail

Road Safety and Motor Vehicle
Regulation Directorate
Transport Canada
Tower C, Place de Ville
330 Sparks Street
Ottawa, Ontario K1A 0N5

To contact TMC by phone

Contact TMC Customer Care at **1-877-855-2867**.

To contact TMC by mail

Thor Motor Coach
Attn: Customer Care
PO Box 1486
Elkhart, IN 46515-1486

Safety and Vehicle Identification

Safety Alerts

Thor Motor Coach uses the following signal words to warn you of possible safety concerns and to provide information to help prevent personal injury and/or damage to the motorhome:

NOTE: Provides helpful information.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death. This symbol may be used in conjunction with the following signal words and with a color that corresponds with the associated safety label.

DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This alert information is limited to the most extreme situations.

WARNING

Indicates a potentially hazardous situation that, if not avoided, may result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE

Indicates a potential situation that, if not avoided, may result in property damage or damage to your motorhome.

NOTE: If any decal, label, or data plate has been removed, damaged, or painted over, please contact your selling dealer's Parts Department to order and replace it.

DANGER

NO SMOKING

Before dispensing fuel, turn off all engines, fuel-burning appliances, and their igniters (see operating instructions).

Do not dispense fuel within 20ft (6.1m) of an ignition source.

Can cause ignition of flammable vapors, which can lead to a fire or explosion and result in death or serious injury.

Vehicle Identification Decals and Plates

The TMC serial number is listed on a label affixed to the inside wall of a Class A motorhome, or on the inside of the passenger's door of a Class C motorhome. Please refer to the chassis manufacturer's owner's manual for the location of your 17-digit chassis VIN.

There are safety decals and vehicle information labels affixed throughout your motorhome. Read and follow the instructions listed on all decals, labels, or data plates before and during operation and storage of your motorhome.

Fire Safety

DANGER

Vehicles and equipment powered by internal combustion engines and placed in recreation vehicles may cause carbon monoxide poisoning or asphyxiation, which could result in death or serious injury.

The flammable liquids used to power these items can cause a fire or explosion, which can result in death or serious injury.

TO REDUCE RISK:

1. Do not ride in the vehicle storage area when vehicles are present.
2. Do not sleep in the vehicle storage area when vehicles are present.
3. Close doors and windows in walls of separation (if installed) when any vehicle is present.
4. Run fuel out of engines or stored vehicles after shutting off fuel at the tank.
5. Do not store, transport, or dispense fuel inside this vehicle.
6. Open the windows, openings, or air ventilation systems provided for venting the transportation area when vehicles are present.
7. Do not operate propane appliances, pilot lights, or electrical equipment when motorized vehicles are present.

Fire safety is an important part of owning a motorhome. Make sure that everyone traveling in the motorhome is familiar with the location of exits, including emergency exit egress windows, should an emergency arise. The following basic rules of fire prevention can help eliminate the possibility of a fire:

- Never store flammable liquids within the motorhome
- Keep cooking surfaces clean
- Never clean with a flammable liquid
- Never leave cooking food unattended
- Never smoke in bed, and always use an ashtray
- Never allow children to play with propane gas or electrical equipment
- Never use an open flame as a flashlight
- Always repair faulty or damaged wiring and electrical components
- Never overload electrical circuits
- Locate and repair propane gas leaks immediately
- Don't allow rubbish to accumulate
- Spray fabrics annually with a flame retardant

If a fire does start, make sure to follow these basic rules of safety:

1. Evacuate everyone (including pets) from the motorhome immediately!
2. After everyone is clear, check the fire to see if you can attempt to put it out. **If it is too large, or the fire is fuel fed, get clear of the motorhome and have the fire department handle the emergency.**
 - a. Switch the 120 volts AC main circuit breaker to the OFF position
 - b. Disconnect the negative battery cable(s) at the auxiliary battery and chassis battery

⚠ WARNING

DO NOT attempt to use water to put out an electrical fire. Water can spread some types of fire, and electrocution is possible with an electrical fire.

2



Typical Class B-C fire extinguisher

NOTE: Know the location of the fire extinguisher installed in your motorhome and become familiar with its operation.

- c. Disconnect the shore line power cord from the shore power receptacle
 - d. Turn OFF the generator (if so equipped)
3. DO NOT attempt to use water to put out the fire. Water can spread some types of fire, and electrocution is possible with an electrical fire.

Always have faulty or damaged wiring and electrical components inspected by a certified RV repair technician, and repaired immediately.

Fire Extinguisher

Fire extinguishers are classified and rated by fire type, A, B, and C. These classifications identify the kinds of fires or burning materials they are designed to fight.

Class A - Solid materials such as wood, paper, cloth, rubber, and some plastics.

Class B - Liquids such as grease, cooking oils, gasoline, kerosene or other flammable liquids.

Class C - Electrical such as electrical wires or other live electrical equipment.

A dry-chemical fire extinguisher has been installed by the entrance door. It is suitable for extinguishing small fires of the Class B or C type only.

Operation

For information on how to use your fire extinguisher, refer to the fire extinguisher manufacturer's owner's manual or the label affixed to the side of the fire extinguisher.

Inspection

Inspect the extinguisher at least once a week (more frequently if it is exposed to weather or possible tampering). This should also be done before beginning a vacation or during an extended trip.

Replacement

The fire extinguisher must be replaced following the fire extinguisher manufacturer's owner's manual instructions, and/or expiration date listed on the label affixed to the side of the fire extinguisher.

Smoke Alarm

⚠ WARNING

This smoke alarm will not alert hearing impaired residents. Special alarms with flashing strobe lights are recommended for the hearing impaired.

The smoke alarm in your vehicle is listed for use in recreation vehicles. They only work properly if they are operational and maintained. They have a limited life and will wear out over time. Immediately replace the smoke alarm if it is not working properly, if it displays any type of problem, or as recommended by the smoke alarm manufacturer. Be sure to read, understand, and follow the information provided by the smoke alarm manufacturer, including information on the limited life of smoke alarms.

Be aware the smoke alarm is not fool proof and cannot detect fires if smoke does not reach it. Anything preventing smoke from reaching the alarm may delay or prevent an alarm.

Though the alarm horn in this detector meets or exceeds current UL standards, it may not be heard for reasons that include (but not limited to): a closed or partially closed door, other noise from electronics, appliances or traffic.

Operation

The smoke alarm is operational once the battery is correctly installed. It will not function if the battery is missing, disconnected, dead, the wrong type, or not installed correctly. It requires one standard 9V battery. Refer to the smoke alarm manufacturer's owner's manual for correct battery and installation information.



Typical RV smoke alarm

The LED light indicates if the battery is functioning properly. When the production of combustion is sensed, the smoke alarm sounds a loud alarm that continues until the air is cleared. The LED light also gives a visual indication of a sounding alarm.

When the battery becomes weak, the alarm will “beep” about once a minute indicating a low battery. This warning should last for 30 days. To assure continued protection, you **MUST** replace the battery once the smoke alarm’s low battery warning (beeping) starts.

Test

WARNING

Test smoke alarm operation after vehicle has been in storage, before each trip, and at least once per week during use.

Failure to do so can result in death or serious injury.

To test, stand at arm’s length from the smoke alarm as the alarm horn is loud and may be harmful to your hearing. The test button will accurately test all functions. Never use an open flame to test the smoke alarm.

Maintenance

Vacuum off any dust on the cover of the smoke alarm using a soft brush attachment. Test the smoke alarm once you have vacuumed. Never use water, cleaners or solvents to clean the smoke alarm as they may damage the alarm. Do not paint the smoke alarm. Refer to the manufacturer’s owner’s manual for detailed maintenance information.

Replacement

Smoke alarms have a limited life and must be replaced following the smoke alarm manufacturer’s owner’s manual instructions, and/or the expiration date listed on the device.

Carbon Monoxide (CO)

⚠ WARNING

The following symptoms are related to carbon monoxide poisoning and should be discussed with all members of the household:

Mild exposure

Slight headache, nausea, vomiting, fatigue (often described as “flu-like” symptoms)

Medium exposure

Severe throbbing headaches, drowsiness, confusion, fast heart rate

Extreme exposure

Unconsciousness, convulsions, cardio-respiratory failure, death

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

⚠ WARNING**CARBON MONOXIDE OR SUFFOCATION DANGER EXISTS**

This is a storage area only and not intended for human or animal occupancy. Failure to follow these instructions could lead to injury or death.

Do not allow children to enter or to play in or around this storage area.

This area is not heated or cooled. Do not store perishables or items in this cargo area that may be damaged by heat or by exposure to cold temperatures.

The risk of carbon monoxide poisoning or suffocation exists in any confined space. Do not allow children or pets to play or become entrapped within the storage compartments of your motorhome.

⚠ DANGER

Do not use gas cooking appliances for comfort heating.

Can lead to carbon monoxide poisoning, which can lead to death or serious injury.

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Safety Regulations and Propane Gas

⚠ DANGER**IF YOU SMELL PROPANE GAS**

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

Ignition of flammable vapors could lead to a fire or explosion and result in death or serious injury.

⚠ DANGER

All pilot lights, appliances, and their igniters (see operating instructions) shall be turned off before refueling of motor fuel tanks and/or propane containers.

Can cause ignition of flammable vapors, which can lead to a fire or explosion and result in death or serious injury.

Warning labels are affixed throughout your motorhome to provide required information on propane safety. Read and follow the instructions listed, and exercise proper precautions when using or around propane and propane appliances.

Warning labels are located in the cooking area to remind you to provide an adequate supply of fresh air for combustion. Unlike a residential home, the oxygen supply in an RV is limited

due to the size of the RV, and proper ventilation must be utilized when using the cooking appliances to help avoid the dangers of asphyxiation.

DANGER

Do not use gas cooking appliances for comfort heating. Can lead to carbon monoxide poisoning, which can lead to death or serious injury.

WARNING

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 to test for leaks. These substances may weaken piping components and cause gas leaks, leading to fire or explosion, which could result in death or serious injury.

WARNING

Gas cooking appliances need fresh air for safe operation. Before operating:

- Open vents or windows slightly or turn on exhaust fan prior to using cooking appliance.
- Gas flames consume oxygen, which should be replaced to ensure proper combustion.
- Improper use can result in death or serious injury.

WARNING

Do not fill propane container(s) to more than 80 percent of capacity. A properly filled container contains approximately 80 percent of its volume as liquid propane.

Overfilling the propane container(s) can result in uncontrolled propane flow, which could lead to a fire or explosion and result in death or serious injury.

⚠ WARNING

THE PROPANE DETECTOR OPERATES ON 12 VOLT HOUSE POWER. IT WILL BE DISABLED WHEN HOUSE BATTERIES ARE DISCONNECTED AND SHORE POWER IS REMOVED!



Typical combination carbon monoxide/propane alarm

Combination Carbon Monoxide/Propane Alarm

⚠ WARNING

The carbon monoxide (CO) alarm installed is intended for use in ordinary indoor locations of recreation vehicles.

Do not disconnect the combination carbon monoxide/propane alarm, or its battery.

Individuals with medical problems may consider using warning devices that provide audible and visual signals for carbon monoxide concentrations under 30 PPM.

This alarm will only indicate the presence of carbon monoxide gas at the sensor. Carbon monoxide gas may be present in other areas.

Your motorhome is equipped with a combination carbon monoxide/propane alarm that is listed for use in recreation vehicles. The combination carbon monoxide/propane alarm will only work if it is operational and maintained.

The combination carbon monoxide/propane alarm is wired directly to the motorhome's 12 volt electrical system, with continuous power being supplied by the auxiliary battery. There is no 9-volt battery power supply in the combination carbon monoxide/propane alarm. If the auxiliary battery cable is disconnected at the battery terminals, the combination carbon monoxide/propane alarm will not be powered, and therefore, will not function.

This alarm is designed to detect the toxic carbon monoxide fumes that result from incomplete combustion, such as those emitted from appliances, furnaces, fireplaces, and auto exhaust. A carbon monoxide/propane alarm is NOT A SUBSTITUTE for other combustible gas, fire or smoke alarms. This carbon monoxide alarm is designed to detect carbon monoxide gas from ANY source of combustion.

It is not designed to detect smoke, fire or any other gas. Please note that there are hazards against which carbon monoxide detection may not be effective, such as natural gas leaks or explosions.

This alarm is designed to sense the presence of carbon monoxide/propane gas, however there are other combustible fumes or vapors that may be detected by the sensor including (but not limited to): acetone, alcohol, butane, and gasoline.

These chemicals can be found in commonly used items such as deodorants, colognes, perfumes, adhesives, lacquer, kerosene, glues, wine, liquor, most cleaning agents, and the propellants of aerosol cans. Be sure to read, understand, and follow the owner's information from the manufacturer of the combination carbon monoxide/propane alarm. This includes information regarding the limited life of the alarm.

What to do if the Alarm Sounds

WARNING

Actuation of this alarm indicates the presence of carbon monoxide, which is a toxic gas that is colorless and odorless.

1. Operate the RESET/SILENCE button
2. Call your emergency services (call 911 in the United States or the fire department)
3. Immediately move to fresh air (outdoors, or by an open door or window)
4. Do not re-enter the premises or move away from the open door or window until the emergency service responders have arrived, the premises have been aired out, and your alarm remains in its normal condition

If your alarm reactivates within a 24-hour period, repeat steps 1-4 and call a qualified appliance technician to investigate for sources of carbon monoxide from fuel burning equipment and appliances, and inspect for proper operation of this equipment. Make sure that motor vehicle(s) are not, and have not been, operating in an attached garage or adjacent to the motorhome.

If problems are identified during this inspection, have the alarm serviced immediately. Note any combustion equipment not inspected by the technician and consult the manufacturer's instructions or contact the manufacturer directly for more information about carbon monoxide safety and this alarm.

Test

⚠ WARNING

Test the combination carbon monoxide/propane alarm after the motorhome has been in storage, before each trip, and at least once per week during motorhome use.

The TEST switch is located on the front of the alarm. Refer to your Owner's Packet for more information from the combination carbon monoxide/propane alarm manufacturer.

Maintenance

Vacuum the alarm cover at least once a year. Clean the cover by hand using a cloth dampened in clean water. Dry with a soft cloth. Do not spray the front panel of the alarm with cleaning agents or waxes. This action may damage the sensor causing an alarm or cause the alarm to malfunction. Do not paint the face of the alarm.

Replacement

The combination carbon monoxide/propane alarm has a limited life and must be replaced following the alarm manufacturer's instructions and/or the expiration date listed on the device.

Exhaust Fuel Fumes

⚠ WARNING

Avoid inhaling exhaust gases as they contain carbon monoxide, which is a toxic gas that is colorless and odorless.

⚠ WARNING

If you are in a parked motorhome with either the engine running or the generator running there is a potential for exhaust fumes to filter back into the motorhome.

To avoid breathing exhaust gases, follow these precautions:

- Do not run the engine in confined areas, such as a closed garage, any longer than needed to move your motorhome in or out of the area.
- The windows should be closed while driving or running the generator (if so equipped) to avoid drawing dangerous exhaust gases into the motorhome.
- If you suspect that exhaust fumes are entering the passenger compartment, have the cause determined and corrected as soon as possible.
- If you must drive under these circumstances, close all the windows and adjust the heating or cooling system to force outside air into the motorhome (set the blower on high speed).
- The best protection against carbon monoxide entry into the motorhome is a properly maintained ventilation system and an active carbon monoxide alarm. To allow for proper operation of the motorhome ventilation system, keep the ventilation inlet grill(s) clear of snow, leaves or other obstructions at all times.

Emergency Egress Window

The emergency egress window (“exit window”) is designed to allow for a quick exit if the main entry door is not available. All exit windows have red operational handles or levers. An exit window may be a large section of an exit window or an entire exit window. It is important you know how to open and operate the exit window(s) in your motorhome before an emergency occurs.

- Before traveling in your motorhome, review the locations and instruct all occupants on how to operate the exit window(s).



Typical emergency egress window exit label

NOTE:

- When an exit window does not have a screen, it is only intended for use as an exit window and is not intended to be used for ventilation purposes.
- A top hinged exit window having a window screen can be used for ventilation purposes when the motorhome is parked; however, **DO NOT** open the exit window more than a 45 degree angle as it is designed to break away from the RV if opened at an angle greater than 45 degrees to allow for emergency egress (exit).
- To avoid window damage, the exit window must be closed tight and locked when the motorhome is traveling.

NOTE: Release latch mechanisms will vary, depending on the exit window design. The exit window may be hinged at the top or side, a breakaway, or it may be a slider window pane. Some models may be equipped with a window screen; however, for your safety it is important that you do not add a window screen to an exit window if one did not come factory-installed by Thor Motor Coach.

- When pulling into your campsite, make sure the ground below each exit window is solid and there is a clear escape path directly outside the exit window(s) clear of trees or other obstacles.
- Plan fire escape routes:
 - Decide who will exit through the exit window(s) first, and in what order
 - Place a blanket or heavy coat over the exit window frame to cushion the exit
 - If there is a fire, the last person designated to exit the motorhome should be prepared to assist those in front
 - Designate a meeting place safely away from the motorhome

Operation

1. Pull the red colored handles as directed by the exit window label instructions to release the latch. Some exit windows have more than one release latch.
2. After releasing the latch as directed, push the exit window pane out (if so equipped).

1. Push red handle and lift from latch.



2. Rotate red handle towards you.



3. Push red handle out, through the bracket, while opening window.

**Maintenance**

Open the exit windows at least twice a year to prevent the rubber seals from sticking.

Seat Belts

⚠ WARNING

All occupants in this vehicle must be seated at a designated seating position and must wear seat belts at all times while this vehicle is in motion.

Failure to do so can result in serious injury.

⚠ WARNING

The sleeping accommodations in this vehicle are designed for occupancy only while vehicle is NOT in motion. All occupants in this vehicle must be seated at a designated seating position and must wear seat belts at all times while this vehicle is in motion.

Failure to do so can result in serious injury.

⚠ WARNING

Do not occupy beds or any other seats that are not equipped with seat belts while the motorhome is in motion.

Seat belts are designed for single occupancy. Do not use a seat belt on more than one person.

⚠ CAUTION

Seat belts and seats can become hot in a vehicle that has been closed up in sunny weather; they could burn a small child. Check that seat covers and seat belt buckles are cool to the touch before allowing a child, passenger, or pet near them.



Typical seat belt located in dinette seating area

All occupants must be furnished with and use seat belts while the motorhome is moving. However, it is not intended for all seats to be simultaneously occupied while the vehicle is in motion without regard to the total loaded weight of your motorhome. The sleeping accommodations in your motorhome are designed for occupancy only while the vehicle is parked.

Operation

Pilot and co-pilot seats must be locked in a forward facing position with seat belts fastened while the motorhome is in motion. Avoid seat rotation while in transit.

- Insert the belt tongue into the proper buckle (the buckle closest to the direction the tongue is coming from) until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.
- Adjust the belt to the proper position; snug and as low as possible around the hips, not around the waist.
- To unfasten, push the release button and remove the tongue from the buckle.

Inspection and Replacement

⚠ WARNING

Failure to inspect and if necessary, replace damaged seat belts could result in severe personal injuries in the event of a collision.

Inspect the seat belts in your motorhome periodically to make sure they work properly and are not damaged; make sure there are no nicks, tears, or cuts. Replace the motorhome seat belts as necessary. A qualified service technician should inspect all seat belt assemblies after a collision. TMC recommends that all seat belt assemblies used in vehicles involved in a collision be replaced.

Child Safety Restraint System

⚠ DANGER

Never let a passenger hold a child on his or her lap while the motorhome is moving. You are required by law to use safety restraints for children in the United States and Canada.

If small children (generally children who are four years old or younger, and weigh 40 lbs. (18 kg.) or less) ride in your motorhome you must put them in safety seats made especially for children.

⚠ DANGER

Rear-facing child seats or infant carriers should never be placed in the front seats of the motorhome.

If your child requires a child safety restraint system (seat), TMC recommends installing the child safety seat in the forward facing booth dinette position. If your motorhome is not equipped with a forward facing booth dinette seat, we recommend that small children that require a child seat not be transported in your motorhome. For rear-facing child seats and infant carriers, the dinette table can be placed in the DOWN position to allow adequate room for the rear-facing child seat.

Always follow the instructions and warnings that come with any infant or child safety restraint system you might use:

- If the child is the proper size, restrain the child in a safety seat. Children who are too large for child safety seats (as specified by your child safety seat manufacturer) should always wear seat belts.
- If the shoulder belt portion of a combination lap and shoulder belt can be positioned so it does not cross or rest in front of the child's face or neck, the child should wear the lap and shoulder belt.
- Never use pillows, books, or other objects to boost a child, passenger, or pet.

NOTE: Check with your local and state or provincial laws for specific requirements regarding the safety of children in your motorhome.



NOTE: If so equipped, the anchor points for child safety seat tethers are located behind the dinette seat back cushions.

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Typical rear vision camera

NOTE: Curves and/or hills may affect the safe placement of warning indicators.

Rear Vision Camera System

Generally speaking, the rear vision camera system (if so equipped) is located at the top of the rear exterior wall. The mating harness and monitor may be factory installed, or available for purchase from your selling dealer.

Prep Only

If your motorhome has rear vision camera prep only, the installation wiring to attach your customer purchased camera system may be located behind a rear wall top clearance light, or accessed via the motorhome roof. Please contact your selling dealership for assistance in locating the installation wires installed on your motorhome.

Emergency Stopping

If an emergency requires you to be stopped, follow these guidelines:

1. Pull off the road as far as possible
2. Put the motorhome in the PARK position and apply the PARKING BRAKE
3. Turn ON the hazard warning flashers
4. Use three red warning indicators such as flares, reflectors, or lanterns as required by the Uniform Vehicle Code and Model Traffic Ordinance as follows:
 - a. Place the first indicator on the traffic side of the motorhome, directed at the nearest approaching traffic
 - b. Place the second 100 feet behind the motorhome in the center of the lane and toward approaching traffic
 - c. Place the third 100 feet in front of the motorhome in the center of the lane and away from the traffic approaching from behind
5. Always stand off the road

Laws of the Road

It is advisable to contact the Department of Motor Vehicles in each respective state for up-to-date information regarding operation and licensing requirements for your motorhome.

The State of California requires operators of motorhomes over 40 feet in length to obtain a non-commercial class B license. California has also enacted legislation limiting use of motorhomes in excess of 40 feet, to approved roadways.

You may contact Caltrans at www.dot.ca.gov or by calling (916) 654-5741 for current information regarding these California statutes.

Condensation

Tips for Controlling Condensation

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

- Allow excess moisture to escape to the outside when bathing, washing dishes, hair drying, laundering, and using appliances and non-vented gas burners.
- Always use the vent hood when cooking.
- Keep the bathroom door closed and the vent or window open when bathing (and for a period of time after you have finished).
- Do not hang wet clothes in the motorhome to dry.
- In hot weather, start the air conditioner early as it removes excess humidity from the air while lowering the temperature.
- Keep the temperature as reasonably cool during cold weather as possible. The warmer the motorhome, the more cold exterior temperatures and warm interior temperatures will collide on wall surfaces, thus creating condensation.

- Use a fan to keep air circulating inside the motorhome so condensation and mildew cannot form in dead air spaces. Allow air to circulate inside closets and cabinets (leave doors partially open). Please keep in mind that a closed cabinet full of stored goods prevents circulation and allows the exterior temperature to cause condensation.
- A natural tendency would be to close the motrorhome tightly during cold weather. This will actually compound the problem. Simply put, you need to remove some of the warm air and allow some cool outside air to get inside the motorhome, so the furnace will not recycle the humid interior air.
- Use fluorescent or LED ceiling lights and minimize prolonged use of incandescent lights, which produce heat and contribute to condensation in the roof area above the ceiling lights.

Chemical Sensitivity

⚠ WARNING

THIS VEHICLE LIKE OTHER VEHICLES MAY CONTAIN SMALL AMOUNTS OF ONE OR MORE SUBSTANCES THAT ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

⚠ WARNING

This product, including its component parts, may contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Examples of chemical sensitivity safety labels, California (USA)

<p>This vehicle may include mercury-containing devices installed by the manufacturer:</p> <p>Remove devices before vehicle disposal. Upon removal of devices, please reuse, recycle, or dispose as hazardous waste.</p>	<div><input type="checkbox"/> High Intensity Discharge Headlamps</div> <div><input type="checkbox"/> Backlit Instruments</div> <div><input type="checkbox"/> Automatic Leveling Jacks</div> <div><input type="checkbox"/> T.V. Antenna Switch</div> <div><input type="checkbox"/> Fluorescent Lamps in Appliances and Fixtures</div> <div><input type="checkbox"/> Flame sensors in gas appliances such as hot water heaters & ovens</div>	<div><input type="checkbox"/> Smoke alarms</div> <div><input type="checkbox"/> <u>Other</u></div> <div><input type="checkbox"/> _____</div> <div><input type="checkbox"/> _____</div> <div><input type="checkbox"/> _____</div>
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Example of safe disposal of hazardous materials label, Vermont (USA)

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

Formaldehyde

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

Ventilation

To reduce or lessen exposure to chemicals from off-gassing it is of utmost importance that you ventilate your motorhome. Ventilation should occur frequently after purchase and at times when the temperatures and humidity are elevated. Remember off-gassing is accelerated by heat and humidity. Open windows, exhaust vents, and doors. Operate ceiling and/or other fans, roof air conditioners, and furnaces. Use a fan to force stale air out and bring fresh air in. Decreasing the flow of air by sealing the recreational vehicle increases the formaldehyde level in the indoor air. Please also follow the recommendations contained in this section regarding tips to avoid condensation problems. Many of the recommendations contained here will assist in avoiding exposure to chemicals that off-gas.

NOTE: Chemical off-gassing is not a "defect" in your motorhome and is not covered by the Thor Motor Coach Limited Product Warranty or the Thor Motor Coach Structural Limited Warranty. Please follow the recommendations in this section to address this concern.

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

Do Not Smoke

Finally, we recommend that you do not smoke inside your motorhome. In addition to causing damage to your motorhome, tobacco smoke releases formaldehyde and other toxic chemicals.

Medical Advice

If you have any questions regarding your health, please consult your doctor or local health department immediately.

Mold

What are molds?

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

What factors contribute to mold growth?

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

How can mold growth be inhibited?

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

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

*For more information of controlling moisture in your motorhome, please read, "Tips to Controlling Condensation," located in this manual.

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Tires and Wheels

Uniform Tire Quality Grade Standards (UTQGS)

This section of your owner's manual contains tire safety information as required by the U.S. Department of Transportation (DOT) National Highway Transportation Safety Administration's (NHTSA) 49 CFR 575.6 Uniform Tire Quality Grade Standards (UTQGS). The UTQGS is intended to aid consumers in making informed choices in the purchase of passenger car tires.

Tire ratings are located on the sidewall of passenger tires sold in the United States (except deep tread, winter-type snow tires; space-saver or temporary use spares; tires with normal rim diameters of 12 inches or less; or limited production tires).

The UTQGS rates tires by treadwear, traction performance, and temperature resistance.

Treadwear

The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course. For example, a tire graded 150 would under one and a half (1-1/2) times as well on the government course as a tire graded 100. The relative performance of tires depends upon the actual conditions of their use, however, and may depart significantly from the norm due to variations in driving habits, service practices and differences in road characteristics and climate.

Traction – AA, A, B, and C

⚠ WARNING

The traction grade assigned to a tire is based on braking (straight ahead) traction tests and does not include cornering (turning) traction.

The traction grades from highest to lowest are AA, A, B, and C, and they represent the tire's ability to stop on wet pavement as measured under controlled conditions on specified government test surfaces of asphalt and concrete. A tire marked C may have poor traction performance.

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NOTE: Always pay close attention to the condition of your motorhome's tires

NOTE: NHTSA's tire rating listings are located online at <https://www.safercar.gov/Vehicle-Shoppers/Tires-Rating>.

NHTSA also has more tire information located online at <https://www.safercar.gov/tires/index.html>.

Traction Grades	Asphalt g-Force	Concrete g-Force
AA	Above 0.54	0.41
A	Above 0.47	0.35
B	Above 0.38	0.26
C	Less Than 0.38	0.26

Temperature – A, B, and C

WARNING

The temperature grade is established for a tire that is properly inflated and not overloaded. Excessive speed, under inflation, or excessive loading, either separately or in combination, can cause heat buildup and possible tire failure.

The temperature grades are A (the highest), B, and C, representing the tire's resistance to the generation of heat and its ability to dissipate heat when tested under controlled conditions on a specified indoor laboratory test wheel. Sustained high temperature can cause the material of the tire to degenerate and reduce tire life, and excessive temperature can lead to sudden tire failure. The grade C corresponds to a level of performance which all passenger car tires must meet under the Federal Motor Vehicle Safety Standard No. 109. Grades A and B represent higher levels of performance on the laboratory test wheel than the minimum required by law.

Temperature Grades	Speed in Miles per Hour
A	Over 115 MPH
B	Between 100 and 115 MPH
C	Between 85 and 100 MPH

Tire Safety

DANGER

Failure to follow proper inflation guidelines may result in tire failure, which, under certain circumstances can cause loss of vehicle control or accidents that may result in property damage, bodily injury, and/or death.

WARNING

It is recommended that the tire pressure be checked at the beginning of each trip to obtain the maximum life of the tire. Follow the instructions listed on the Federal Certification label to determine the correct tire pressure.

Read and follow the instructions listed below before taking your first trip in your new motorhome!

- Proper care and maintenance of your motorhome tires is essential to ensure your safety, as well as the safety of others, as you travel.
- Routine maintenance on your motorhome is important, but it cannot be overstated just how critical proper tire maintenance is to the safety, operation and durability of your new vehicle.
- You must follow the manufacturer's inflation guidelines for maximum load capacity; under-inflation is just as dangerous as over-inflation.
- To insure your motorhome tires are operating safely, regular inspection of your tires and checking tire pressures is absolutely mandatory.
- Examine your motorhome tires frequently for unusual wear. Alignment, balance and bearing wear will affect tire wear. Make sure to look for cracking, bulging, uneven tread wear, etc.

NOTE: State of California (USA) Tire chain notice: YOUR MOTORHOME CAN NOT BE OPERATED WITH TIRE CHAINS.

NOTE: Do not bleed air from hot tires or your tires may then become under-inflated.







IF YOUR FRONT TIRES LOOK LIKE THIS						
TIRE PATTERN	TOE	CAMBER	CENTER	EDGE	CUPPING	PATCHY
COMMON CAUSE	VEHICLE WHEEL ALIGNMENT	VEHICLE WHEEL ALIGNMENT	TIRE OVER INFLATION	TIRE UNDER INFLATION	VEHICLE WORN SUSPENSION	TIRE OUT OF BALANCE

Illustration of common tire wear patterns

When you are using your motorhome, check the inflation pressure of each tire weekly to insure maximum tire life and travel wear. Tire pressure should only be checked when the tires are cold. During travel, your tires heat up and the air pressure inside the tire increases.

Lug Nut Torque

Being sure wheel mounting nuts (lug nuts) on the wheels are tight and properly torqued is an important responsibility that you need to be familiar with, and practice. Inadequate and/or inappropriate wheel nut torque (tightness) is a major reason that lug nuts loosen in service. Loose lug nuts can rapidly lead to a wheel separation with potentially serious safety consequences.

Refer to the chassis manufacturer's information for proper lug-nut torque and tightening sequence.

Tire Inflation

Your tires and wheels support the entire weight of your motorhome and its contents. Your tires are also the only contact your motorhome has with the road surface. Determining and maintaining proper inflation is the most important factor in maximizing the life of your tires.

Driving on a tire that does not have the correct inflation pressure for the vehicle load is dangerous and may cause premature wear, tire damage, tread delamination and/or loss of control of your motorhome.

Underinflated tires can lead to disaster. Avoiding this is quick and easy:

- **FIND YOUR PSI.** Your PSI is the pounds per square inch of air pressure that's right for your tires. The correct PSI for your tires is located on your motorhome's tire information label – not on the sidewall of your tire.
- **CHECK IT MONTHLY.** At least once a month, check all your motorhome tires air pressures (including the spare tire) using an accurate pressure gauge. Bottom line: you cannot tell if your tires are underinflated just by looking.

Alignment

NOTICE

The front suspension and steering system of this motorhome was factory aligned prior to it being dispatched to the dealership. The alignment is however, greatly affected by the way the unit is loaded prior to travel. This loading includes how much cargo, water, and LP are carried as well as the distribution of said cargo. Thor Motor Coach advises to have the alignment checked in the fully loaded condition (the way you would normally load the unit to travel). Not having the alignment checked and reset can result in abnormal tire wear.



Tire pressure under-inflation can cause serious tire failure

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NOTE: Toe-in and toe-out (only) are inspected by TMC prior to shipment to your selling dealer.

Changing a Spare Tire (if so equipped)

⚠ WARNING

Do not use the leveling jack system to support the motorhome while under the vehicle or changing tires. The leveling system is designed as a leveling system only. Do not use the leveling jack system as a jack or in conjunction with a jack. If a tire change is required, it is highly recommended the work be performed by a knowledgeable trained professional. Attempts to change a tire while supporting the motorhome with the leveling jack system could result in damage to the motorhome and risk causing serious injury or death.

⚠ WARNING

When replacing a tire, make sure to replace it with a tire of the same size and specifications listed on your motorhome's Federal Weight label.

⚠ WARNING

The motorhome is very heavy. Raising the motorhome to replace the spare tire should only be done with extreme caution by a qualified technician. The vehicle could slip, causing personal injury or death. **DO NOT ATTEMPT TO DO THIS YOURSELF.**

If you experience a flat tire while driving your motorhome, gradually decrease your vehicle speed (if possible). Hold the steering wheel firmly and direct the motorhome to a safe place on the side of the road. Please contact a road service provider, a qualified RV service repair center, or 911 in the U.S. for assistance. It is highly recommended you do not attempt to change a spare tire or jack the motorhome yourself; this is why a jack handle has not been included with your motorhome.

Make sure the road service technician reads and is familiar with the Chassis Packet tire changing information. Make sure the wheel nuts have been tightened to the proper torque as outlined in your Chassis Packet.

Tire Identification Information

To maintain the load capacity of your motorhome, it is vitally important to only replace worn or damaged tires with tires with ratings equal to or higher than what was originally equipped on your vehicle. The illustration, located on the next page, describes important tire information that is embossed on every tire by the manufacturer.

The Load Index may be indicated with two numbers separated with a forward slash. The first number is the load index of the tire configured as a single tire on a single wheel. The second number indicates the load index of the tire as a dual-wheel configuration. Multiplying the second number by 2 will give you the total Load Index for the dual wheel configuration.

The load index per tire configured as dual wheel is less than a single tire to provide a margin of safety for the load-carrying capacity of the tire in the event that one of the dual tires is punctured or otherwise fails.

NOTE: The tires supplied on your Class C motorhome carry a "Light Truck" rating.

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R: The “R” stands for radial. Radial tires have been the industry standard for the past 20 years.

P or LT: The “P” indicates the tire is for passenger vehicles. “LT” indicates the tire is for light trucks.

NOMINAL WIDTH: This three-digit number gives the width of the tire in millimeters from sidewall edge to sidewall edge. The larger the number, the wider the tire.

MAXIMUM LOAD RATING: This number indicates the maximum load the tire can carry.

MAXIMUM PERMISSIBLE INFLATION PRESSURE: This number is the greatest amount of air pressure that should ever be put in the tire. This is NOT the same as the vehicle manufacturer’s recommended tire pressure.

TEMPERATURE: The temperature rating indicates how well the tire resists heat.

ASPECT RATIO: This two-digit number gives the tire’s ratio of height to width. A number of 50 or lower indicates a short sidewall for improved steering response and better overall handling.

TRACTION: The traction rating indicates the tire’s ability to allow a car to stop on wet pavement in a shorter distance.

TREADWEAR: The treadwear rating indicates how long the tire should last. The higher the number, the longer it should take for the tires to wear down.

RIM DIAMETER CODE: This two-digit number is the wheel or rim diameter in inches.

LOAD INDEX: This two- or three-digit number is the tire’s load index. It is an indicator of how much weight each tire can support. Note: You may not find this information on all tires because it is not required by law.

SPEED RATING: The speed rating tells you the maximum speed capability of a tire. The speed ratings include speeds from 99 mph to above 186 mph. Note: You may not find this information on all tires because it is not required by law.

M+S: This indicates that the tire has some mud and snow capability.

U.S. DOT TIRE IDENTIFICATION NUMBER: This number begins with the letters “DOT” and indicates that the tire meets all Federal standards. The next two or three numbers or letters are the plant code where the tire was manufactured. The last four numbers represent the week and year the tire was built. For example, the numbers 3107 means the 31st week of 2007. The other numbers are marketing codes used at the manufacturer’s discretion. This information is for contacting consumers if a tire defect requires a recall.

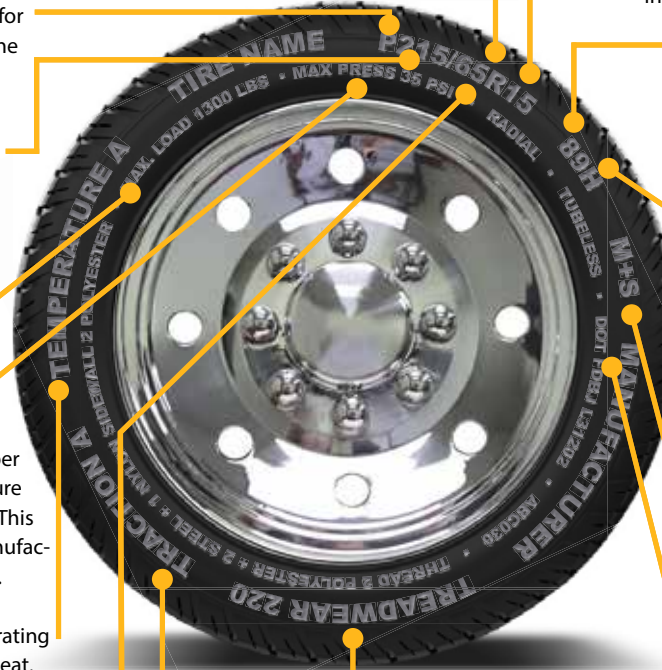


Illustration courtesy of NHTSA, www.safercar.gov

Weighing, Loading, and Towing

⚠ WARNING

Do not exceed any applicable motorhome weight ratings. Doing so could damage your motorhome or affect handling and braking characteristics.

Your motorhome's braking system is designed and rated for operation at the gross vehicle weight rating (GVWR) listed on the unit's weight labels, not the gross combined weight rating (GCWR).

Proper loading is one of the most important considerations when traveling in a motorhome. Your motorhome is built to withstand a set maximum load (GVWR). Read and follow the information listed on your motorhome's Federal Certification Label (located in the driver's area) to determine safe load limits. For safety's sake, **NEVER OVERLOAD YOUR MOTORHOME.**

Federal Weight Label

MANUFACTURED BY: THOR MOTOR COACH, INC.			OFFLINE: MM/YY		
GVWR: XXXX KG (XXXXX LB)			SERIAL: XXXXXXXXXXXXXXXX		
INC. VEH. MFG. BY: <Insert Chassis Manufacturer>			MODEL: XXXX		
GAWR KG(LB)	TIRES	RIMS	COLD INFLATION PRESSURE	SINGLE	DUAL
FRONT: XXXX (XXXX)	LT215/85R16	5.5 J X 16	XXX KPA(XX PSI)	<input type="checkbox"/>	<input type="checkbox"/>
REAR: XXXX (XXXX)	LT215/85R16	5.5 J X 16	XXX KPA(XX PSI)	<input type="checkbox"/>	<input type="checkbox"/>
TAG:				<input type="checkbox"/>	<input type="checkbox"/>
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT IN MM/DD/YYYY					
V.I.N.: XXXXXXXXXXXXXXXXXX			TYPE: MULTIPURPOSE PASSENGER VEHICLE		

Typical Federal Weight Label, including GVWR, GAWR, and tire pressure information

The TMC Motorhome Weight Specifications label concisely states the occupant and cargo carrying capacity of your motorhome and meets the requirements of 49 CFR part 571.120 as issued by the National Highway Traffic Safety Administration (NHTSA).

NOTE: If a boat, trailer, or other vehicle is being towed, it should be weighed and combined with the motorhome's weight to ensure the total weight does not exceed the gross combined weight rating (GCWR).

Motorhome Occupant and Cargo Carrying Capacity Weight Label

MOTORHOME OCCUPANT AND CARGO CARRYING CAPACITY
VIN# 1XXXXXXXXXXXXXXXXX
THE COMBINED WEIGHT OF OCCUPANTS AND CARGO SHOULD NEVER EXCEED:
XXX kg or XXX lbs
Safety belt equipped seating capacity: X
CAUTION:
A full load of water equals XXX kg or XXX lbs of cargo @ 1kg/L (8.3 lb/gal) and the
tongue weight of a towed trailer counts as cargo
 (Serial #: XXXXXXXXXXXXXXXX)

Typical Motorhome Occupant and Cargo Carrying Capacity Label

The Motorhome Occupant and Cargo Carrying Capacity weight label is affixed to the interior side of the forward-most door of your motorhome on the passenger side, directly below the window screen for Class A motorhomes, or on the front door jamb for Class C motorhomes. This label indicates how much weight you can safely carry within the motorhome. The total weight of passengers, cargo, trailer tongue weight, and water should never exceed the value shown on this label.

Weight Terminology

GROSS VEHICLE WEIGHT RATING (GVWR)

the maximum permissible weight of this motorhome.

UNLOADED VEHICLE WEIGHT (UVW)

the weight of this motorhome as manufactured at the factory with full fuel, engine oil, and coolants.

OCCUPANT AND CARGO CARRYING CAPACITY (OCCC)

equal to the GVWR minus UVW and LP. In other words, OCCC is how much weight in occupants, cargo, water, and trailer tongue weight that can be added to the motorhome without exceeding the GVWR.

GROSS COMBINED WEIGHT RATING (GCWR)

the maximum allowable loaded weight of this recreation vehicle with its towed trailer or towed vehicle.

GROSS AXLE WEIGHT RATING (GAWR)

the value specified as the load carrying capacity of a single axle system, as measured at the tire ground interfaces.

Weighing Your Motorhome

When loading your cargo, be sure it is distributed evenly to prevent overloading front to back and side to side. Heavy items should be placed low and as close to the axle positions as reasonable. Too many items stored on one side of your motorhome may overload a tire. Periodically weigh your motorhome at a public scale to determine axle loads.

To weigh your motorhome correctly, measure the fully loaded vehicle axle by axle and wheel position by wheel position. You can find certified public or commercial vehicle scales at moving and storage lots, farm suppliers with grain elevators, gravel pits, recycling companies, and large commercial truck stops. You can also look in the telephone book under “weighers” or “weighing”.

Allow adequate time, since the entire weighing process can take around 30 minutes. There may be a small fee for each weight taken, but the expense is a worthwhile investment toward the safe and economical operation of your motorhome.

Your motorhome must be weighed fully loaded. That is with passengers, food, clothing, fuel, water, propane, supplies etc. Any towed vehicle (car/pickup, boat, or trailer) or item loaded on brackets on the back of the motorhome should also be included in the weighing.

The following procedure is suggested when using a long platform scale, although any method recommended by the scale operator which correctly determines weight value is acceptable. During all measurements, it is important to keep the vehicle as level as possible.

1. Pull onto the scale so that only the front axle is on the platform with the end of the scale midway between the front and rear axles and record the weight (**Reading A**).
2. Pull forward until the full unit is on the scale and record the weight (**Reading B**).
3. Pull forward so that only the rear axle is on the scale and record the weight (**Reading C**).
4. To determine the weight of individual wheel positions, repeat the previous three steps, but this time, use only one side of the motorhome on the scale. Record the weight readings. To calculate the wheel position weight for the opposite side of the motorhome, subtract these weight readings from weight readings A, B, and C recorded in steps 1, 2, and 3.

Your motorhome must remain as level as possible on the scale, even though an axle or side



Reading A: Front



Reading B: Total Coach



Reading C: Back

NOTE: Thick Black Lines in the illustrations above represent a vehicle weighing scale.

NOTE: Additional cargo carrying capacity can be obtained by reducing the amount of fresh water carried while driving.

is not physically on the scale. To obtain the side-to-side weights, there must be enough space on either side of the scale to allow the motorhome to be partially off the scale.

For improved accuracy, Thor Motor Coach recommends using a segmented 4-pad scale, when possible, to determine individual wheel weights. The corner weights should not exceed half of the respective Gross Axle Weight Rating (GAWR) or the maximum load rating for the tire or set of dual tires at the rear, whichever is less.

Individual wheel position weights must not exceed the maximum tire load capacity. The maximum load rating for the tire can be found embossed on the tire's sidewall.

If any of the corner weights exceed half of the listed GAWR or tire ratings, relocate the passengers and redistribute or remove a portion of the cargo until the weight is within the proper limits for all four corners of the vehicle.

Check your motorhome vehicle weight periodically to obtain optimum mileage from your tires, and to improve vehicle handling. Tires should always be inflated as recommended in the chassis manufacturer's instructions or on the tire sidewall (refer to your Chassis Packet).

Weight Distribution

Improper weight distribution or too much weight on your motorhome's suspension system can cause spring, shock absorber, or brake failure, handling or steering problems, irregular tire wear, tire failure, or other damage. An overloaded motorhome is hard to drive and hard to stop. In cases of serious overloading, brakes can fail completely, particularly on steep hills. The load a tire will carry safely is a combination of the size of tire, its load range, and corresponding inflation pressure.

Loading Tips

Store and secure all loose items inside the motorhome before traveling. Overlooked items such as canned goods, or small appliances on the countertop, cooking pans on the range or free-standing furniture items can become dangerous projectiles during a sudden stop. Distribute cargo side-to-side so the weight on each tire does not exceed one-half of the GAWR for either axle. For traveling safety, it is important to make sure any tie down straps (if so equipped) on appliances or furniture are secured.

Packing for Travel

Pay careful attention to where and what type of flammable materials you store. Certain storage areas are clearly labeled DO NOT STORE COMBUSTIBLE MATERIALS. Examples of spark producing areas, depending on the motorhome model, are: base kitchen cabinets, front dinette base, exterior refrigerator service compartment, as well as refrigerator cabinet. Please use discretion as to what potentially dangerous products your motorhome contains while traveling. Be sure all canisters and bottle tops are secure and leak free.

The following checklist will assist your preparing the living quarters for a trip:

- In winter, make sure that the fresh water system is freeze protected.
- Make sure that all storage items are secured, and heavy items are stored low so they do not fall.
- Make sure all of your motorhome appliances work (if so equipped: stove, oven, microwave, refrigerator, water heater, water pump, furnace, etc.).
- Check that you have up-to-date and correct paperwork such as an owner's registration card, vehicle registration, proof of insurance, valid driver's license, etc.
- When preparing for your trip, always consider vehicle weight when loading the motorhome.
- When traveling, you may want to drain the fresh water tank, or keep the quantity of water in it to a minimum. This reduces the total weight of the motorhome. A full tank of fresh water can affect the handling and CCC of the motorhome.

Towing With Your Motorhome

⚠ WARNING

- An auxiliary braking system may be required for control of a towed vehicle behind the motorhome. Do not assume the braking capabilities of the motorhome cover the towed vehicle.
- The designated hitch rating may exceed the GCWR or other towing capacity limits of the motorhome. It is your responsibility to properly load the motorhome, while staying within the tow ratings, GCWR, GVWR, and GAWRs of the motorhome.
- Do not tow loads that cause the motorhome to exceed the Gross Combined Vehicle Weight Rating (GCWR).
- Do not exceed the vertical hitch load rating (tongue weight) as listed on the hitch label.
- Consult your owner's manual for additional information regarding towing guidelines for this motorhome.
- Failure to comply can result in loss of vehicle control resulting in death or serious injury.

⚠ WARNING

A SEPARATE FUNCTIONING BRAKE SYSTEM IS REQUIRED FOR ANY TOWED VEHICLES OR TRAILERS WEIGHING MORE THAN 1000 LBS WHEN FULLY LOADED. NEVER EXCEED THE GVWR, OR THE GAWR SPECIFIED ON THE Motorhome CERTIFICATION LABEL. Also never exceed the weight ratings of the trailer hitch installed on the motorhome. Failure to heed any part of this warning could result in loss of control of the motorhome and towed vehicle or trailer and may cause an accident and serious injury. For specific towed vehicle braking requirements, consult your chassis owner's manual.

⚠ WARNING

THE Motorhome FULLY LOADED AND THE TRAILER, OR TOWED VEHICLE, MUST NOT EXCEED THE Motorhome CHASSIS' GROSS COMBINED WEIGHT RATING (GCWR). Consult with your selling dealer to determine the GCWR of the motorhome. Do not exceed the motorhome gross combined weight rating (GCWR) or the hitch rating. The tongue weight, the weight pushing down on the hitch, must not exceed 10% of the hitch capacity.

⚠ WARNING

DO NOT TOW LOADS THAT EXCEED THE GROSS COMBINED VEHICLE WEIGHT RATING OR OTHER TOW RATINGS OF THIS MOTORHOME.

⚠ WARNING

THE DESIGNATED HITCH RATING MAY EXCEED THE GCWR OR OTHER TOWING CAPACITY LIMITS OF THE MOTORHOME. It is your responsibility to properly load the motorhome, while staying within the tow ratings, gross combined and gross vehicle weight ratings.

NOTE: Thor Motor Coach accepts no responsibility for damage to the chassis and other components resulting from towing loads greater than its designated class specifications. Also consider the gross combined weight rating (GCWR) of the motorhome before towing a trailer or vehicle. Towing an object such as a boat, trailer, or vehicle behind the motorhome results in added driving considerations that you must contend with.

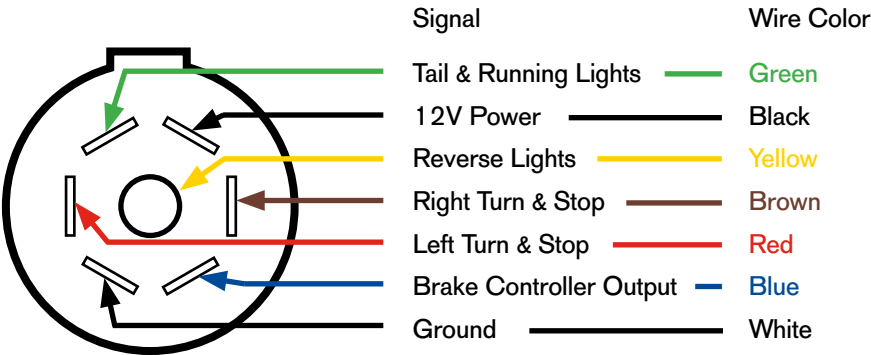
Always use safety chains between your motorhome and the towed trailer or vehicle. Cross the chains under the trailer tongue and allow slack for turning corners. Connect the safety chains to the trailer or vehicle frame or hook retainers. Never attach safety chains to the bumper of a vehicle.

Tow bars or car dollies generally are made to travel in a forward direction only. Most towing equipment of this type is not designed for backing. Never attempt short back up distances with a tow bar or tow dolly. Damage to the motorhome, towed vehicle or towing device will result.

NOTE: Aftermarket adapters are available to convert the wiring of a 7-way towing vehicle connector to a 4-way trailer plug.

Electrical Connections to a Towed Vehicle

A 4-way or 7-way trailer plug, supplied by the chassis manufacturer, is prewired to the chassis electrical system. This plug provides electrical power for running lights, turn signals, stop lights, and electric trailer brakes. Before connecting your motorhome to any towed vehicle, verify that the wiring of the towed vehicle plug conforms to your motorhome connector wiring. Refer to your Chassis Packet for additional information regarding vehicle towing.



Typical 7-way trailer connection

4-way connectors (towing vehicle side) are typically wired as follows:



Signal	Wire Color
Right Turn and Brake	Green
Left Turn and Brake	Yellow
Running Lights	Brown
Ground	White

Typical 4-way trailer connection

Chassis

For information regarding proper maintenance and other important chassis details, refer to the Chassis Packet information. You, as the owner, are responsible for taking proper precautions when attempting any repair or maintenance for your motorhome. If you are not sure what action to take, or are uncomfortable with performing a maintenance or repair function, contact your selling dealer, or a designated chassis manufacturer servicing dealer for assistance. Contact your chassis manufacturer for a service dealer near you.

NOTE: All issues regarding the chassis warranty, parts and service should be directed to the chassis manufacturer. Make sure to follow the recommendations as outlined in the Chassis Packet information to ensure proper future performance and economy.

Class A Motorhome Engine Access

⚠ WARNING

IF THE ENGINE COVER IS NOT SEATED CORRECTLY, EXHAUST GASES MAY LEAK INTO THE MOTORHOME, CREATING A DANGEROUS AND POTENTIALLY LETHAL SITUATION.

Your Class A motorhome's engine can be accessed for service from inside the motorhome. If you cannot locate the engine cover, please contact your selling dealer or TMC Customer Care for assistance. When reinstalling the engine cover, make sure that it is seated correctly without obstruction from carpet, floor mats, etc.

Chassis Alternator

The 12 volts DC chassis alternator supplies power to both the automotive systems as well as any auxiliary battery if equipped, and directly to the motorhome living quarters while the vehicle motor is running. The alternator compensates for electrical usage in the vehicle, the power drawn by lights, fans, and other 12 volt powered items as well as the charging of the automotive and auxiliary batteries.



Typical battery isolation manager. This device is usually located in the battery compartment of the motorhome.

If the alternator is not keeping pace with the draw on your motorhome's electrical system while driving down the road, it means it is working in a negative mode: more power is being used than the alternator is putting out. This means that you are taking power out of the batteries. If you draw too much power from your batteries there may not be enough power left to start the motorhome or run any of the 12 volts DC appliances when you stop for a break or for the night.

The alternator will charge at a higher rate right after the motorhome has been started, replacing the power used to start the vehicle, but the charging should quickly go back to "normal" and hold its own even when you turn on lights or appliances.

If the alternator shows a discharge while the motor is running, turn OFF appliances and lights to see if a charge comes on or if the alternator indicates "neutral". Then apply a drain on the system to see if a discharge returns. If a discharge persists, contact your dealer.

When stopped at a campsite that allows you use of the shoreline, the 120 volts AC electrical system will recharge your auxiliary battery. Under heavy usage in warm weather, check the fluid level of those batteries that require attention to fluids quite often. Low battery fluid level is very harmful to the battery's longevity.

Battery Isolation Manager

⚠ CAUTION

Unless you intend to run the vehicle engine, keep the ignition switch in the OFF position. Doing so will:

- 1. Reduce the risk of unnecessary chassis battery drain.**
- 2. Allow the Battery Isolation Manager to connect the chassis battery to the house battery charging system.**

When the motorhome engine is not running, the chassis and house battery(ies) are electrically isolated by the use of a battery isolation manager. This controller prevents house power consumption from discharging the chassis battery while the motorhome is parked.

Some additional characteristics of the battery isolation manager include:

1. The isolator electrically delays connecting the house batteries to the vehicle charging system for approximately 15 seconds, to allow the alternator time to reach full charging ability.
2. After this initial time delay, the isolator senses the voltage of the vehicle charging system. The isolator connects the house battery to the vehicle's charging system only when the chassis charging system reaches the correct voltage.
3. If the vehicle's charging voltage drops below 13.2 volts for a period of 4 seconds, due to low idle speed and/or excessive load, the isolator will disconnect the house batteries until the vehicle's charging voltage returns to a level of 13.2 volts or above. For this feature, there is a built-in delay period of approximately 10 seconds.
4. The isolator allows the chassis battery to be charged by the house charging device (usually the converter or inverter) when 120 VAC is in use (shore power or generator power).
5. The isolator allows vehicle starting from the house battery(ies) via the Emergency (Auxiliary) Start Switch.

Emergency (Auxiliary) Start Switch (if so equipped)

Your motorhome may be equipped with an Emergency (auxiliary or Aux) start switch. Located in the vehicle's cockpit, near the drivers seating area, this switch connects the house battery to the vehicle's starting circuit. This feature is used for situations when the chassis battery is too depleted to start the vehicle on its own. Connecting the house battery to the chassis battery may provide the needed energy to start the vehicle's engine.

To operate: Depress the 'EMER START' switch, located on the front driver's dash, and hold. Next, use the ignition key to start chassis engine. Release the 'EMER START' switch after the engine has started.

It is strongly advised to turn off all 12 volt DC devices before using the emergency start feature. This will help ensure that all available energy stored in the house battery can be used for vehicle starting.

NOTE: Do not hold the ignition key in the start position for more than 30 seconds. Be careful not to run down the auxiliary battery as this could leave you without 12 volts DC power.

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Typical emergency start switch

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Electrical Systems

ELECTRICAL SYSTEMS

Shore Line Power Cord

⚠ WARNING

THIS CONNECTION IS FOR 208Y/120-VOLT or 120/240-VOLT AC, 3-POLE, 4-WIRE, 60 HZ, 50 AMPERE SUPPLY. DO NOT EXCEED CIRCUIT RATING. EXCEEDING THE CIRCUIT RATING MAY CAUSE A FIRE AND RESULT IN DEATH OR SERIOUS INJURY.

Typical 50 amp electrical service label

⚠ WARNING

THIS CONNECTION IS FOR 110-125-VOLT AC, 60 HZ, 30 AMPERE SUPPLY. DO NOT EXCEED CIRCUIT RATING. EXCEEDING THE CIRCUIT RATING MAY CAUSE A FIRE AND RESULT IN DEATH OR SERIOUS INJURY.

Typical 30 amp electrical service label

⚠ WARNING

The campsite 120 volt power receptacle(s) should always be tested for proper functionality prior to connecting your motorhome's shore line power cord to it. Do not hook up the shore line power cord to any receptacle until you have verified proper polarity and grounding.

DO NOT plug the shore line power cord into a campsite receptacle:

- That has reverse polarity
- With non-functioning ground circuits
- That shows outward signs of heat damage

Doing so may result in property damage or serious injury. Damage or injury resulting from a connection to a malfunctioning or improperly wired power source is not covered by warranty.

It is the responsibility of the owner of the electrical receptacle to ensure that the receptacle is properly wired and grounded. Reverse polarity and/or improper grounding of your motorhome can cause personal injury or death.



Typical 50 amp shore line power cord connection port

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NOTE: The shore line power cord should be unplugged when the motorhome is left unattended. If something would happen to the electrical system, this may help limit potential damage.

⚠ WARNING

Do not use any cheater plug, adapter, or extension cord to reconfigure incoming alternating current (AC) power or break the continuity of the circuit connected to the grounding pin.

- **Do not connect the shore line 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 shock and electrocution hazards.**
- **Do not connect the shore line 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.**

⚠ WARNING

Make sure the breakers at the electrical power source are in the OFF position before connecting or disconnecting your shore line power cord.

⚠ WARNING

The shore line power cord must be fully extended when in use, and not left coiled in the electrical compartment or on the ground. If the shore line power cord is left coiled, it may potentially create enough heat to melt its protective casing.

A 30 amp or 50 amp shore line power cord is provided to connect the motorhome to a grounded 120 volts AC power source. Depending upon your brand and model, the shore line power cord will either be permanently mounted to a motorhome interior compartment or detachable. When hooking up to the external power source:

1. Turn OFF the load center main 120 volts AC circuit breaker
2. Carefully extend the entire length of the shore line power cord (approximately 25'-35') from the electric cable hatch to the external power source
3. Plug the shore line power cord into the receptacle. Be sure all the prongs are properly plugged into the receptacle
4. Turn the load center main circuit breaker back ON

When you are ready to leave, reverse the shore line power cord connection process. Use care to prevent damaging the electrical connection pins when connecting or disconnecting the shore line power cord. Grasp the plug to remove the shore line power cord from the outlet; do not unplug it by pulling on the cord.

Maintenance

Inspect the shore line power cord for cuts, cracks, and worn insulation; replace it immediately if these symptoms are noticed.

Monitor Panel

Items that may typically be found on the monitor panel include (inclusion and location will vary by model year, brand and model):

- Lighted holding tank level indicators and switch(es)
- Lighted battery level switch and indicator
- Lighted water heater switches (electric & propane gas)
- Lighted water pump switch
- Generator start / stop switch

NOTE: Monitor panel design, features, and functions vary depending on model year, make, and model. Motorhomes equipped with multiplex systems have other features integrated into the controller. For further assistance, contact your selling dealer or TMC Customer Care at (877) 855-2867.



Typical Class A motorhome auxiliary battery compartment

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Typical Class C motorhome auxiliary battery location (under entrance step)

- Fuel tank gauge and hour meter with switches for fuel pump and fuel levels
- Tank heater switches
- Light switches for some interior and exterior lights
- Lighted cargo bed master control switch
- Slideout control switches (press and hold to extend or retract)
- Awning control switches (press and hold to extend or retract)

Auxiliary Battery

Whether factory installed or customer purchased, your auxiliary (house) batteries are typically located in a separately vented compartment or storage box. Be sure you know the location of your batteries before leaving your selling dealership. It is important to keep your motorhome batteries fully charged at all times. We recommend turning OFF lights and other 12 volts DC (VDC) components when they are not being used. To prevent draining your motorhome batteries, connect the motorhome to a 120 volts AC power source whenever possible.

Testing the Batteries

⚠ WARNING

Keep sparks, cigarettes and flames away from the batteries as the hydrogen gas they create may explode.

Do not connect a booster battery or other power source that outputs more than 14.2-volts DC to the motorhome batteries.

Use adequate ventilation when charging or using batteries in an enclosed space.

Remove metal jewelry and always wear eye protection when working around batteries.

⚠ WARNING

Do not allow battery electrolyte (acid) to come into contact with skin, eyes, fabric or painted surfaces. Electrolyte is a sulfuric acid solution that could cause serious personal injury or property damage.

If your hands, eyes, clothes or the painted surface of your motorhome are exposed to electrolyte, flush the exposed area thoroughly with water.

If electrolyte gets in your eyes, immediately flush them thoroughly with water and get prompt medical attention.

Storing the Batteries

To prevent auxiliary battery discharge when your motorhome is not connected to an external power source for an extended period of time, it is recommended you turn OFF the 12 volt battery DISCONNECT SWITCH, or MAIN POWER SWITCH and disconnect each battery at the negative battery cable.

During storage, it is important to check battery voltage at least every two weeks and to recharge them as needed. If you remove the batteries from your motorhome, protect them from accidental shorting and keep them in a cool, dry, well ventilated area.

Master Battery Disconnect Switch

The 12 volts DC master battery disconnect switch is used to disconnect the motorhome from auxiliary or “house” battery power during periods of storage or during service. The 12 volt master battery disconnect switch must be in the ON position in order to maintain charge in the chassis and auxiliary (“house”) batteries, and for the 12 volts DC house electrical system to operate.



Typical master battery disconnect switches

NOTE: When traveling, the master battery disconnect switch must be turned ON to operate the backup camera system and dash radio (if so equipped).



Typical converter: model, features, and installation location varies, depending on motorhome model and floorplan.

6



Typical inverter: model, features, and installation location varies, depending on motorhome model and floorplan.

Converter

The power converter turns 120 volts AC power to useable 12 volts DC power when the shore line power cord is connected to an external power source. The converter has a built-in protective thermal breaker that will shut it down should overheating occur. Overheating can be caused by operating the converter above its maximum power output for an extended period of time, or by an obstruction to its ventilation air flow.

Inspection and Maintenance

If the power converter is not working check the fuse(s) located on the outer case. There are no customer serviceable parts inside the converter case and the manufacturer's warranty will be voided if the case has been opened. If you have further concerns please contact your selling dealer.

Inverter

⚠ WARNING

The factory-installed inverter is not intended for use with medical device(s).

Your motorhome may be equipped with a factory installed inverter that converts 12 volts DC to useable 120 volts AC. It also supplies continuous AC power to the appliance plugged into it. It is important that you familiarize yourself with the inverter function and operation. The inverter should be turned OFF when the motorhome is in storage.

Inspection and Maintenance

If the inverter is not functioning check both the circuit breaker protecting the inverter input, and the fuse located on the inverter. There are no customer serviceable parts inside the inverter case and the manufacturer's warranty will be void if the case has been opened. The inverter cooling fins and the cooling fan should be kept clear of any obstructions. If you have further concerns contact your dealer.

Circuit Breakers

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 motorhome wiring.

120 volts AC circuit breakers protect the 120 volt wiring and components in your motorhome from circuit overloads and short circuits. Should a circuit overload or short circuit occur, the circuit breaker protecting the affected circuit will "trip," preventing the flow of electricity through that circuit.

If a circuit breaker trips, turn OFF the electrical appliance on that circuit and allow the circuit breaker to cool down. After the cool down period, reset the circuit breaker by moving the switch to the OFF position and then back to the ON position. If the circuit breaker re-trips or frequently trips, contact your selling dealer's service department to have the electrical problem diagnosed and repaired.

A circuit breaker identification label is permanently attached to the inside surface of the 120-volt Load Center. The circuit breakers will not offer complete protection of the motorhome electrical system in the event of a power surge or spike.

Maintenance

Before using your motorhome, inspect the circuit breakers and replace them as needed. Test each circuit breaker by moving the individual switches to the OFF position, and then back to the ON position. Circuit breakers may degrade over time and, as part of your motorhome's maintenance, must be replaced as needed.



Typical ATC blade-type fuse

NOTE: Refer to the Chassis Packet for information regarding the chassis fuses and circuit breakers.

Fuses

⚠ WARNING

Replacement fuses must be of the same voltage, amperage rating, and type. Never use a higher rated replacement fuse as it may cause a fire by overheating your motorhome wiring.

The 12 volts DC fuse panel label indicates fuse sizes, positions, and the electrical components powered. At the beginning of camping season, inspect all the 12 volt fuses and replace them as needed. Before replacing a fuse always shut OFF the engine, generator, and all motorhome electrical systems completely, including making sure the electrical components listed on the fuse label are in the OFF position:

1. Shut OFF the chassis engine
2. Disconnect the shore line power cord
3. Shut the generator OFF (if so equipped)
4. Turn the inverter OFF (if so equipped)
5. Disconnect the auxiliary battery main negative battery cable
6. Remove the fuse panel cover
7. Make sure the electrical component located on the fuse label is turned OFF
8. Pull the fuse straight out of the fuse block. If inspection of the fuse confirms that it is not blown, some other electrical problem may exist. Please contact your selling dealer's Service Department for further repair assistance.

9. Insert a new fuse of the same specified voltage, amperage rating, and type in the original location. Never use a higher rated replacement fuse

The fuse panel label should be kept permanently affixed to your motorhome. The fuses will not offer complete protection of the motorhome electrical system in the event of a power surge or spike. Fuses are maintenance components and must be replaced as as needed.

Ground Fault Circuit Interrupter (GFCI)

The ground fault circuit interrupter (GFCI) receptacle is designed to reduce possible injury caused by electric shock. The GFCI receptacle(s) will not protect against short circuits or circuit overloads.

Inspection

Test all GFCI receptacles monthly:

- Make sure the circuit breaker is in the ON position (it must be connected to 120 volt power to reset the GFCI, as needed).
- Push in the GFCI TEST button. The GFCI RESET button should pop out indicating the GFCI receptacle has been “tripped” and the 120 volts AC power is interrupted.
- Then push in the GFCI RESET button to restore 120 volts AC power.

Contact your selling dealer’s service department for repair assistance if the GFCI RESET button does not restore 120 volt power when it pops back out. All ground faults must be repaired before using your motorhome.



Typical GFCI receptacle



Typical Cummins Onan generator

6

Generator

⚠ DANGER

Operating the generator creates exhaust gases that contain carbon monoxide. CARBON MONOXIDE IS POISONOUS AND CAN CAUSE UNCONSCIOUSNESS AND DEATH.

Never operate the generator in an enclosed building or structure where carbon monoxide gas could accumulate. Always keep the exhaust system of the generator clear from obstructions.

1. DO NOT operate the generator while sleeping. You would not be aware of exhaust entering the motorhome, or alert to symptoms of carbon monoxide poisoning.
2. Never store anything in generator compartment. Always keep compartment clean and dry.
3. DO NOT operate the generator in an enclosed building or in a partly enclosed area such as a garage.
4. Review the safety precautions for fuel and exhaust fumes elsewhere in this manual.
5. DO NOT operate the generator when the motorhome is parked in high grass or brush. Heat from the exhaust could cause a fire in dry conditions.
6. Never operate your chassis or generator engine, or the engine of any vehicle, longer than necessary when the vehicle is parked.
7. DO NOT simultaneously operate generator and a ventilator which could result in the entry of exhaust gas. When exhaust ventilators are used, we recommend that a window on the opposite side of the unit “upwind” of exhaust gases be opened to provide cross ventilation.
8. When parked, orient the vehicle so that the wind will carry the exhaust away from the vehicle. DO NOT open nearby windows, ventilators, or doors into the passenger compartment, particularly those which can be “down wind”, even part of the time.

9. DO NOT operate the generator when parked in close proximity to vegetation, snow, buildings, vehicles, or any other object could deflect the exhaust under or into the vehicle.
10. DO NOT touch the generator when running, or immediately after shutting OFF. Heat from the generator can cause burns. Allow the generator to cool before attempting maintenance or service.

IMPORTANT: MAKE SURE TO READ AND UNDERSTAND THE GENERATOR OWNER'S MANUAL BEFORE OPERATING THE GENERATOR. Observe all operating instructions and warnings as well as all recommended maintenance schedules and procedures.

The onboard generator makes your motorhome fully self-contained. It allows you access to 120 volts AC when there is no shore power available, but keep in mind that carbon monoxide is deadly! NEVER sleep in the motorhome with the generator running! Before you start and use the generator, inspect the exhaust system. Do not use it if the exhaust system is damaged. Test the carbon monoxide alarm every time you use the motorhome. Know that the symptoms of carbon monoxide poisoning are:

- Dizziness
- Vomiting
- Nausea
- Muscular twitching
- Intense headache
- Throbbing in the temples
- Weakness and sleepiness
- Inability to think coherently

If you or anyone else experience any of these symptoms get to fresh air immediately. Shut the generator OFF, and do not operate it until it has been inspected and repaired by an RV certified technician. If the symptoms persist seek immediate medical attention.

NOTE: The diesel generator requires 12 volt DC power from the house auxiliary batteries to start, and draws diesel fuel to operator from the chassis fuel tank. If the fuel level to the chassis fuel tank drops to or below $\frac{1}{4}$ full, the generator will automatically shut OFF and cannot be restarted until the fuel tank is filled to above $\frac{1}{4}$ full.

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⚠ DANGER

Potentially explosive fuel vapor may be present at fuel filling stations and during refueling of equipment with the fuel transfer system. Never enter a fuel filling station or refuel equipment if your furnace or water heater is operating or if your refrigerator is operating on propane. Both the flame and the ignitors in the burners of these appliances are sources of ignition, and could cause an explosion. These appliances must be turned OFF before entering a fuel filling station or refueling equipment. Turning OFF the propane main tank valve only is not sufficient. The appliances must be OFF at their electrical operating switches.

⚠ WARNING

Fuel-soaked rags or other materials contain flammable and/or explosive fuel vapors and other hazardous substances. Clean up materials should be temporarily stored in a nonflammable, vapor-tight container until proper disposal facilities are available. Do not store flammable clean up rags or materials inside the motorhome, inside any other vehicle or near any source of flame or ignition.

Be extremely careful when fueling your motorhome. Always shut OFF the engine, do not smoke, do not use cellular phones, and shut OFF all pilot lights before adding fuel. Fuel spills represent a serious fire hazard, and should be cleaned up immediately. Never restart the engine or relight pilot lights while raw fuel is present. When the weather gets cold or your motorhome has not been used for a while, a fuel additive (customer supplied) may be needed.

Fuel Cap (if so equipped)

If you should lose your fuel cap, it should be replaced as soon as possible, with a cap of the same type. Always remove the fuel cap slowly and pay close attention to the fuel recommendations outlined in the Chassis Packet.

⚠ DANGER

NO SMOKING

Before dispensing fuel, turn off all engines, fuel-burning appliances, and their igniters (see operating instructions).

Do not dispense fuel within 20ft (6.1m) of an ignition source.

Can cause ignition of flammable vapors, which can lead to a fire or explosion and result in death or serious injury.

⚠ DANGER

All pilot lights, appliances, and their igniters (see operating instructions) shall be turned off before refueling of motor fuel tanks and/or propane containers.

Can cause ignition of flammable vapors, which can lead to a fire or explosion and result in death or serious injury.

Fuel Pump Collision Shut-Off Switch (if so equipped)

If your motorhome is involved in a collision, it is possible that an inertia switch in the fuel pump circuit will open, shutting down the flow of fuel to the engine. This is a safety feature designed to help keep raw fuel from spilling out and creating additional danger. When this inertia switch has been tripped, it is necessary to manually reset it before the motorhome can be restarted and moved. Review your Chassis Packet information for the location of the switch and instructions for resetting.

Fuel Transfer System (if so equipped)

DANGER

Vehicles and equipment powered by internal combustion engines and placed in recreation vehicles may cause carbon monoxide poisoning or asphyxiation, which could result in death or serious injury.

The flammable liquids used to power these items can cause a fire or explosion, which can result in death or serious injury.

TO REDUCE RISK:

- 1. Do not ride in the vehicle storage area when vehicles are present.**
- 2. Do not sleep in the vehicle storage area when vehicles are present.**
- 3. Close doors and windows in walls of separation (if installed) when any vehicle is present.**
- 4. Run fuel out of engines or stored vehicles after shutting off fuel at the tank.**
- 5. Do not store, transport, or dispense fuel inside this vehicle.**
- 6. Open the windows, openings, or air ventilation systems provided for venting the transportation area when vehicles are present.**
- 7. Do not operate propane appliances, pilot lights, or electrical equipment when motorized vehicles are present.**

⚠ DANGER

Any motorized equipment powered with flammable liquid can cause fire and explosion or asphyxiation if stored or transported inside the garage. To reduce the risk of fire, explosion, or asphyxiation:

- 1. Do not allow passengers to ride inside the storage area at any time.**
- 2. Prior to storing vehicles in the garage, run fuel out of the engine after shutting OFF fuel at the vehicle fuel tank.**
- 3. Do not store or transport any motor fuel inside the garage.**
- 4. Ventilate the interior of the garage to reduce the risk of fire, explosion or asphyxiation. Open the ventilation panels on either side of the cargo area.**
- 5. Do not operate propane appliances, pilot lights, or electrical equipment when motorized vehicles or motorized equipment are inside the garage. Set the cargo electrical disconnect switch to OFF.**

A fuel transfer system allows you to store gasoline for use in motorcycles, snowmobiles, ATVs, or other vehicles and equipment while at a campsite. This system consists of a fuel tank, fuel tank filler, fuel gauge, fuel transfer pump, fuel transfer valve and hose with fill nozzle. A master pump switch is located on the inside control panel and an emergency shutoff switch is located on the frame rail near the fuel transfer pump. A metal ground clip reduces the possibility of static electricity discharge between the fuel station and the equipment being fueled.

To fill the tank, remove the fuel filler cap and fill the tank with the grade of gasoline required by your equipment. When replacing the fuel fill cap, be sure it seats squarely and turn it firmly to lock it on the fill pipe neck.

Fuel Transfer System Safety

Static electricity-related incidents when refueling are extremely unusual. They appear to happen most often during cool or cold and dry climate conditions. In rare circumstances, these static related incidents have resulted in a brief flash fire occurring at the fill point. You can minimize these and other potential fueling hazards by following safe refueling procedures.

NOTE: The diesel generator requires 12 volts DC power from the house auxiliary batteries to start, and draws diesel fuel to operator from the chassis fuel tank. If the fuel level to the chassis fuel tank drops to or below ¼ full, the generator will automatically shut OFF and cannot be restarted until the fuel tank is filled to above ¼ full.

A build-up of static electricity can be caused by reentering a vehicle during fueling. If you return to the fuel fill pump during refueling, the static may discharge at the fill point, causing a flash fire or small sustained fire with fuel vapors.

Here are some additional refueling safety guidelines when refueling a vehicle or filling up fuel storage containers:

- Turn OFF vehicle engine. Disable or turn OFF any auxiliary sources of ignition: the furnace, water heater, stove, oven, and any pilot lights, etc. Turn OFF the main propane valve.
- Do not smoke, light matches or lighters while operating the refueling system, or when using fuel anywhere else.
- Use only the refueling latch provided on the fuel dispenser nozzle.
- Never jam or otherwise try to lock the refueling latch on the fuel fill.
- Do not re-enter your motorhome during refueling. If you cannot avoid re-entering your vehicle, discharge any static build-up BEFORE reaching for the nozzle, by touching something metal with a bare hand, such as the vehicle body or frame that is located away from the nozzle.
- In the unlikely event a static-caused fire occurs when refueling, leave the nozzle in the fill pipe and back away from the vehicle. Turn OFF the fuel pump master switch immediately.
- Do not over-fill or top-off your vehicle tank, which can cause fuel spillage.
- Never allow children under licensed driving age to operate the pump.
- Avoid prolonged breathing of gasoline vapors. Use fuel only in open areas that get plenty of fresh air.
- Keep your face away from the nozzle or container opening.
- Never siphon fuel by mouth. Never put fuel in your mouth for any reason. Fuel can be harmful or fatal if swallowed. If someone swallows fuel, do not induce vomiting. Contact an emergency medical service provider immediately.
- Keep fuel away from your eyes and skin; it may cause irritation.
- Remove fuel-soaked clothing immediately.
- Use gasoline as a motor fuel only. Never use gasoline to wash your hands or as a cleaning solvent.

Propane System

Propane or liquefied petroleum (LP) gas is a clean and efficient form of energy when proper handling and safety precautions are observed. The propane system in your motorhome furnishes the fuel for cooking, heating, hot water and propane generator (if so equipped). Propane can also be used as an alternative energy source for refrigeration.

The propane system is comprised of numerous components such as the propane container, hoses, propane gas regulator, and piping and copper tubing lines to each appliance. Propane is heavier than air; the gas tends to flow to lower areas and will sometimes pocket in these low areas, such as the floor.

Propane Gas Safety

⚠ DANGER

IF YOU SMELL PROPANE GAS

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

Ignition of flammable vapors could lead to a fire or explosion and result in death or serious injury.

⚠ DANGER

Do not use gas cooking appliances for comfort heating. Can lead to carbon monoxide poisoning, which can lead to death or serious injury.

⚠ DANGER

Do not use gas cooking appliances for comfort heating.

Can lead to carbon monoxide poisoning, which can lead to death or serious injury.

⚠ DANGER

All pilot lights, appliances, and their igniters (see operating instructions) shall be turned off before refueling of motor fuel tanks and/or propane containers.

Can cause ignition of flammable vapors, which can lead to a fire or explosion and result in death or serious injury.

⚠ DANGER

Fuel spills represent a serious fire hazard, and should be cleaned up immediately. Never restart an engine or re-light any pilot lights while raw fuel is present.

⚠ WARNING

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 to test for leaks. These substances may weaken piping components and cause gas leaks, leading to fire or explosion, which could result in death or serious injury.

⚠ WARNING

Gas cooking appliances need fresh air for safe operation. Before operating:

- Open vents or windows slightly or turn on exhaust fan prior to using cooking appliance.
- Gas flames consume oxygen, which should be replaced to ensure proper combustion.
- Improper use can result in death or serious injury.

Propane is a colorless and odorless gas that, in the liquefied state, resembles water. An odorant (usually a sulfur compound) is added as a warning agent. If you smell propane within your motorhome, quickly and carefully perform the procedure listed on the label to the right.

Continued periodic checks of the propane system periodically (or at least once a year), by a qualified propane service representative as part of your normal maintenance is recommended. Hand tighten the propane gas system valves only, do not use a wrench or pliers as over tightening may damage the valve seals and cause them to leak.

Propane Leak Test

Leaks may be found easily with a soapy water solution. Do not 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.

Apply the soapy solution to the outside of the gas piping fittings. If a leak is present, the soapy solution will “bubble” at the leak point. If a leak is indicated, shut OFF the propane system valve(s) and contact a your selling dealer’s service department or qualified propane service representative immediately.

Propane Gas Tank

WARNING

Do not fill propane container(s) to more than 80 percent of capacity. A properly filled container contains approximately 80 percent of its volume as liquid propane.

Overfilling the propane container(s) can result in uncontrolled propane flow, which could lead to a fire or explosion and result in death or serious injury.

WARNING

If you suspect your propane container has been overfilled, contact your selling dealer or a qualified propane technician for assistance immediately. Do not attempt to service a propane container overfill yourself.

NOTE: Propane tanks are to be installed, fueled, and maintained in accordance to country, federal, state, and local codes, rules, regulations, laws, or guidelines.



Typical propane gas tank

⚠ WARNING

Always shut OFF the engine while refueling propane tank. Do not smoke and do not operate other ignition sources while refueling.

A permanently mounted A.S.M.E. (American Society of Mechanical Engineers) approved propane container is located under the floor of your motorhome. Propane expands 1½ percent for every ten degrees of increase in temperature. It is imperative to leave sufficient space inside the container to allow for natural expansion of gas during warmer weather.

Servicing or Filling

Because the propane tank is not removable, the motorhome will need to be driven to a qualified propane facility for servicing or filling. Only the authorized gas service technician(s) should be near the motorhome while the propane tank is being filled. The new propane container must be carefully purged for proper appliance performance and operation. The propane tank must NEVER BE OVERFILLED.

Never allow your propane tank to be filled above the maximum safe level as indicated by the fixed liquid level gauge. Do not allow the visible gauge to be used for filling. Overfilling the propane container above the liquid capacity indicated on the container, could allow liquid propane to enter the system that is designed for vapor only creating a hazardous condition.

The following warning label has been placed on the propane tank:

Using the Propane System

After your motorhome is completely set up, to operate the propane system:

1. Close ALL burner valves, controls and pilot light valves.
2. Open the main valve in the propane tank slowly to avoid a fast rush of propane vapor through the excess flow valve causing propane “freeze-up.” If you experience propane “freeze-up,” 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 selling dealer’s Service Department to have the propane system tested.
4. Light the appliances as needed and directed in the appropriate appliance manufacturer instructions.

Make sure that you read and fully understand ALL safety requirements for handling and operation of the propane system.

Traveling With Propane

Some states prohibit propane appliances to be operated during travel, especially in underground tunnels. Make sure you are familiar with the laws for the areas where you travel.

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Water Systems

WATER SYSTEMS

Fresh Water System

Potable (drinking) water is supplied throughout your motorhome from the fresh water tank or from a connection to an outside water source attached to the city water fill. When using the fresh water tank, water is pressurized and travels through the water lines by means of the water pump. When utilizing an exterior water source, such as a campsite water spigot, the water pump is not needed as the campsite water source is already pressurized and will flow through the water supply lines.

Potable Water Hose

We recommend purchasing and keeping sanitized a water hose whose sole function is for use with your potable water system. We do not recommend using the same water hose for potable water, maintenance, or sewer system cleanup, etc.

Connecting to an Exterior Water Fill

1. Set your water heater bypass valves to the correct position listed on your water system label.
2. Remove the cap from the fresh water inlet on the side of the motorhome.
3. Attach one end of your potable (drinking) water hose to the outside source of water.
4. Connect the other end of the hose to the motorhome's city water inlet.
5. Turn ON the outside source of water. Gradually open the hot and cold water at the sinks and tub to clear air from the lines. Close the faucets when the water is flowing freely.

To Disconnect From the Outside Water Source

1. Turn OFF the outside source of water.
2. Disconnect your potable water hose from the supply valve and the fresh water inlet.
3. Remove the water hose and store.
4. Reinstall the cap on the fresh water inlet.



Typical city water fill

NOTE: Disconnect from the fresh water inlet or city water fill if leaving your motorhome for an extended period longer than a few hours.



Typical fresh water gravity fill

NOTE: It is normal to lose water from the fresh water tank via the overflow tube while traveling.

Filling the Fresh Water Tank

NOTICE

Do not leave the motorhome unattended while filling the fresh water tank. Although the fresh water tank has an overfill vent, incoming water volume may exceed the capacity of the overfill vent, creating excessive pressure within the water tank and possible damage to seals and fittings.

When an outside source of water is unavailable, water can be drawn from the fresh water storage tank in the motorhome. This can be referred to as dry-camping.

1. Set your water heater bypass valves to the correct position listed on your water system label
2. If your fresh water tank overflow valves are shut OFF or capped:
 - a. Open the fresh water tank overflow shut-off valves, or
 - b. Unscrew and remove the fresh water tank overflow valve caps
3. Remove the water fill cap
4. Water can now be added directly to the fresh water tank through the fill spout by use of a clean potable water hose or a bucket that used only for this purpose. We do not recommend using the same bucket to fill your potable (drinking) water tank and perform maintenance tasks, etc.
5. When the tank is full and water is coming out of the fresh water overflow tubes located under your motorhome:
 - a. Stop filling the fresh water tank
 - b. Replace the water fill cap
 - c. Allow water to continue to flow from the fresh water tank overflow tubes until the water pressure equalizes and there is no more water coming from the overflow tubes

To use water from the fresh water tank, turn the water pump ON to pressurize the water in the

lines and to the water heater. When ready, gradually open the hot and cold water at the sinks and tub to clear air from the lines (it can be normal to see water "spit" from the faucets until the system is pressurized). Close the faucets when the water is flowing freely.

Water Pump

When you are not connected to city water (e.g., campsite water) and want to use water in your motorhome you will need sufficient 12 volts DC power to run the water pump. Once turned ON at the monitor panel, the water pump (also known as an on-demand pump) will self-prime and provide water.

OPERATION

The water pump is designed for use on an as needed basis. Using the water pump continuously or with high pressure will shorten its operational life and is not covered by warranty. The water pump has a check valve that prevents water from back flowing into the fresh water tank. Before operating the water pump:

1. Make sure there is adequate water in the fresh water tank.
2. Be sure the water heater bypass valves are set correctly according to your water system label.
3. Open all the faucets (first hot, then cold) including your interior and exterior shower faucets.
4. Turn the pump switch ON, and allow the water pump to fill the water lines and hot water tank. After water is flowing in a steady stream from all your faucets, turn the faucets OFF. The water pump should stop operation automatically when all faucets are closed. The pump should now run "on-demand" when a faucet is opened, and stop when the faucet is closed.

WATER PUMP STRAINER

If so equipped, periodically check the in-line water pump strainer for accumulated debris. To clean the water pump strainer shut OFF the water pump, unscrew the clear cap, remove the reusable metal cartridge, clear any debris, and reinstall the strainer and cap.

NOTE: Do not turn the water pump ON if the fresh water tank is empty. Doing so could cause damage to the water pump, or blow a fuse.

NOTE: Do not turn ON the water pump when using water from an external source. Only run the water pump if using potable water stored in your fresh water tank.

NOTE: The water pump should be turned OFF when the motorhome is left unattended for any amount of time. This may help limit potential damage should something fail within the water system.

Water pump strainer



Typical water pump installation

For additional information on the care and operation of the water pump, refer to the water pump manufacturer's information.

Sanitizing the Fresh Water System

Sanitize the fresh water system before initial RVing use each year, after extended periods of motorhome storage, at least once a year during continuous use, or if you think the fresh water system has been compromised or contaminated.

1. Remove or by-pass your potable (drinking) water filter (if so equipped).
2. Disconnect and cap (or by-pass) your refrigerator ice maker inlet water line (if so equipped).
3. Disconnect and cap (or by-pass) your dishwasher inlet line (if so equipped).
4. Disconnect and cap (or by-pass) your washer inlet line (if so equipped).
5. If you have a dishwasher, ice maker, or washer follow the appropriate appliance manufacturer's instructions pertaining to sanitization.
6. Prepare a solution using a gallon of water and ¼ cup of liquid household bleach (5% sodium hypo-chlorinate solution). Use one gallon of solution for each 15 gallons of tank capacity.
7. Open your fresh water tank bypass tube shut off valves, or uncap them.
8. With an empty tank and all faucets and drains closed, pump the solution into the fresh water tank, via the water fill cap using the water pump. Or carefully pour 1/2 cup of bleach (1/4 cup per 15 gallons of capacity) into your potable (drinking) water hose before connecting it to the water source. The water source pressure will push the chlorine and water into the fresh water tank, making the correct solution when the fresh water tank is full.
9. Completely fill the fresh water tank with fresh water.
10. Switch ON the water pump. Open all the faucets one at a time until all air is purged, and the water flows freely.
11. Add fresh water to the fresh water tank again, until the water level reaches the fill spout.
12. Allow the solution to stand in the fresh water tank for at least three (3) hours.
13. Drain the fresh water system by opening all faucets and the fresh water tank drain valve while flushing the system with fresh potable (drinking) water.

14. Continue flushing the system, allowing the water to flow for several minutes.
15. Close the fresh water tank drain valve and the faucets. Refill the system with potable (drinking) water.

Waste Water System

Depending on your motorhome model year, make, and model, the water and debris from the sinks and shower (or tub) flow into the gray water (or waste water) holding tank. Water and debris from the toilet flow into the black water (or sewage) holding tank. Some brands and models may also have the lavatory, shower, or tub draining into the black water (waste water) holding tank.

Drain Pipes

Drain pipes have P-traps and/or waterless traps (HEPVOs) installed to help prevent drain odors from escaping into the motorhome. During travel, water within P-traps may displace and permit odors into the motorhome. Drain-related odors come from decomposing materials in the holding tank. If odors are detected, place a few cups of water down each drain and use a RV approved deodorizing agent, which will reduce drain odors and help keep the drain lines and tanks clean and free flowing. Drain chemicals are available at RV supply stores.

Vents

Vent pipes and vents release air from the grey and black water holding tanks. The exterior vent cap is attached to the roof, and must be kept clear of debris and obstructions to perform as intended. On some brands and models, the vent pipe may be part of the drainage system referred to as a “wet vent” (water flows downward as air flows upward in the same pipe).

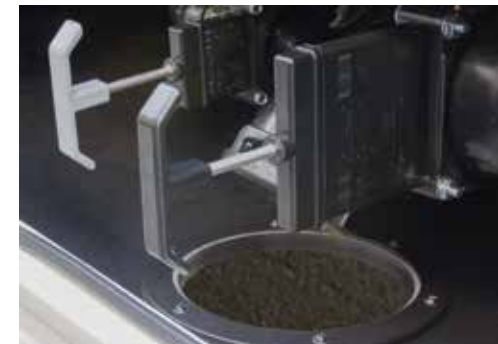
Emptying the Holding Tanks

1. Remove the cap from the sewer drain and connect your flexible sewer drain line.
2. Attach the other end of the flexible sewer drain line to the dump station inlet. Be sure both ends of the flexible sewer drain line are securely attached.

NOTICE

Remove the waterless trap before using mechanical drain-rooting devices. Otherwise, the waterless trap can be damaged.

Typical HEPVO valve label (if so equipped)



Typical termination valves

NOTE: We recommend wearing gloves and other protective gear when emptying the holding tanks.

NOTE: It is important to familiarize yourself with your motorhome's waste drainage system, as some models have two gate valves on a single black tank.



Typical black tank flush

3. Drain the black water holding tank first by pulling the termination valve handle away from the valve body. Be sure to allow sufficient time for the black water holding tank to completely drain, then rinse the black water holding tank with several gallons of water by depressing the toilet stool pedal, hand flush handle, or use the black tank flush (if so equipped).
4. Drain the gray water holding tank by pulling the termination valve handle away from the valve body. Draining the gray water holding tank last allows the soapy water in the gray water holding tank to rinse the sewer drain and flexible sewer drain line.
5. When both the black water and gray water tanks are emptied, close the termination valves by pushing the handles back to the closed positions.
6. Remove the flexible sewer drain hose, and wash it thoroughly with clean water. Remove the other end from the dump station inlet, and replace it in its storage compartment.
7. Replace the sewer drain caps on both the motorhome outlet and the dump station inlet.

Black Tank Flush

⚠ CAUTION

Do not use the tank flush valve unless the fullway termination valve is in the open position.

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

Winterizing the Water Systems

⚠ WARNING

Automotive antifreeze (ethylene glycol) and windshield washer antifreeze (methanol) are poisonous. Never use these products in your fresh water system. These products are harmful and may be fatal if swallowed.

Preparing for colder weather or storage is very important. The motorhome should be winterized at the end of the camping season, or when exposed to temperatures that will fall at or below 32°F (0°C). Repairs due to freezing are not covered by warranty. Add only RV antifreeze to the fresh water system to ensure freeze protection. It may be easier to winterize the motorhome with another person assisting you.

1. Level the motorhome and drain the fresh water plumbing system.
2. Remove or by-pass your potable (drinking) water filter (if so equipped).
3. Disconnect and cap (or by-pass) your refrigerator ice maker inlet water line (if so equipped).
4. Disconnect and cap (or by-pass) your dishwasher inlet line (if so equipped).
5. Disconnect and cap (or by-pass) your washer inlet line (if so equipped).
6. If you have a dishwasher, ice maker, or washer follow the appropriate appliance manufacturer's instructions pertaining to winterization (and de-winterization).
7. Turn OFF both the 12 volt gas and 120 volt electric water heater switches on the monitor panel.
8. Turn OFF the gas valve at the water heater or shut the tankless water heater switch OFF.
9. Turn the water heater bypass valves (if so equipped) to the BYPASS position. (A tankless water heater may not have bypass valves).
10. Move the valves to the WINTERIZE position, as shown on your water system label.
11. Close the low point drains.
12. Attach a hose to the city water fill and insert the other end of the hose into a gallon container of RV antifreeze (this quantity should be enough to winterize the motorhome). To assist the siphoning process, put the container on a surface approximately two feet above ground level.
13. Turn the water pump ON. If the water pump fails to self-prime, temporarily open the low point drains. Close the low point drains as soon as the water pump primes (RV antifreeze will begin draining out), and before continuing to the next step.
14. Open the hot water side on all faucets (kitchen, lavatory, shower, and exterior shower) until RV antifreeze begins to flow continuously.

NOTE: Do not operate the water heater or use the motorhome plumbing system after the water system has been winterized.

15. Close the faucet hot water lines and repeat with the cold water lines on all the faucets.
16. Flush the toilet a couple of times until you see antifreeze in the bowl.

When you are done adding RV antifreeze:

17. Remove the water hose from the container of RV antifreeze.
18. To prevent staining, wipe the RV antifreeze out of the sinks, shower (or tub) and toilet using a soft, dry cloth.

De-winterizing Your Motorhome

1. Drain the holding tanks (fresh water, waste water, and sewage).
2. Attach a garden hose to the fresh water fill, and fill the fresh water tank.
3. Turn ON the water pump switch and open the cold water side of all faucets and shower fixtures. Shut OFF the faucet and shower fixtures after the water runs clear (no pink residue), and repeat for the hot water side.
4. Flush the toilet until clear water runs into bowl.
5. Dump the holding tanks again.
6. Sanitize the water system (refer to Sanitization).
7. If a potable (drinking) water filter has been installed: drain the water lines, remove the assembly, clean and reinstall using a new potable (drinking) water filter.
8. When ready to use the water heater, open the bypass valve allow water to enter and fill the water heater tank (remember to shut OFF the water heater bypass mixer valve, if so equipped).

Leveling Jacks and Slideout Systems

LEVELING JACKS AND SLIDEOUT SYSTEMS

DANGER

FAILURE TO ACT IN ACCORDANCE WITH THE FOLLOWING INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

READ THE ENTIRE OPERATORS MANUAL AND ALL PRECAUTIONS PRIOR TO OPERATING THIS EQUIPMENT.

DANGER

Do not attempt to operate the system while the motorhome is in motion. If the “jacks down” alarm sounds while driving the motorhome, immediately find a safe place to pull over and stop. Set the parking brake and when it is safe, inspect the leveling system.

WARNING

DO NOT OPERATE ANY SYSTEM FUNCTIONS WHILE ANYONE IS UNDER THE MOTORHOME. IF WORK UNDERNEATH YOUR MOTORHOME IS REQUIRED, SUPPORT BOTH FRONT AND REAR AXLES WITH JACK STANDS. DO NOT RELY ON THE SUPPORT OF THE LEVELING SYSTEM! FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY OR DEATH.

WARNING

DO NOT USE THE JACKS TO CHANGE THE TIRES. THE SYSTEM IS DESIGNED FOR LEVELING AND STABILIZING, AND IS NOT MEANT TO LIFT ALL THE WHEELS OFF THE GROUND! LIFTING THE WHEELS OFF THE GROUND MAY RESULT IN AN UNSTABLE VEHICLE CONDITION, WHICH MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

10

⚠ WARNING

MAKE SURE THERE ARE NO OBSTRUCTIONS IN THE “EXTEND” OR “RETRACT” PATHS OF THE JACKS. KEEP ALL PEOPLE AND PETS CLEAR OF THE MOTORHOME WHILE OPERATING THE LEVELING SYSTEM. ALWAYS VISUALLY CONFIRM THE JACKS HAVE FULLY RETRACTED BEFORE MOVING THE MOTORHOME. MOVING THE MOTORHOME WHILE THE JACKS ARE EXTENDED COULD CAUSE DAMAGE TO THE JACK SYSTEM AND THE MOTORHOME.

⚠ WARNING

NEVER EXPOSE HANDS OR OTHER PARTS OF THE BODY NEAR HYDRAULIC LEAKS. HIGH-PRESSURE OIL LEAKS MAY CUT AND/OR PENETRATE THE SKIN CAUSING SERIOUS INJURY.

⚠ CAUTION

The motorhome must be level with the leveling jacks in the down position before operating slideouts.

Leveling Jacks (if so equipped)

Operate the leveling system **ONLY** under the following conditions:

1. Park the motorhome on a reasonably level surface.
 - a. Use (customer supplied) jack pads if parked on a soft surface.

2. Put the chassis transmission in the:
 - a. NEUTRAL position for rear mount diesel engine vehicles.
 - b. PARK position for all front mount gasoline or diesel engine vehicles.
3. Engage the motorhome PARKING BRAKE.
4. Start the chassis engine and keep it running while operating the leveling jack system.
5. Be sure all persons, pets, and property are clear of your motorhome while operating the leveling system. If you are operating an automatic system with occupants inside the motorhome, they must stay seated during the leveling process.

NOTE: If you have an automatic leveling system, do not allow people to walk around when attempting to level the motorhome. Doing so could disrupt the leveling jack's sensing mechanism.

Stabilizing Jacks (if so equipped)

If your motorhome is equipped with power rear stabilizing jacks, the operating button is located inside the motorhome by the stepwell. Be sure the rear power stabilizing jacks are retracted in the up (travel) position before driving the motorhome.

NOTE: Stabilizing jacks are not designed or intended to be used to level the motorhome.

Slideout Systems

DANGER

Do not move or drive your motorhome with slideout(s) extended.

TMC motorhomes are equipped with hydraulic or electric slideout systems, or a combination of both. Please refer to the slide mechanism manufacturer's owner's manual and follow their safety, operation, and maintenance instructions. If you feel you are missing this information, please contact your selling dealership, TMC Customer Care, or the slide mechanism manufacturer for assistance. Or for your convenience, many of our suppliers make their manuals available for download from their respective websites.

⚠ CAUTION**BEFORE OPERATING SLIDEOUT ROOMS:**

- **Remove travel bars or slide-locks if equipped**
- **Engage emergency brake**
- **Place driver and front passenger seats in the most forward position and place the seat-backs in the upright position, otherwise slideout may contact and damage these seats**

⚠ CAUTION

The motorhome must be level with the leveling jacks in the down position before operating slideouts.

Before extending the slideout, check around and above the exterior of the motorhome to be sure the slideout will not hit anything outside when it is fully extended; also check the interior of your motorhome to be sure that slideout travel is free from obstructions before operation.

Extending the Slideout

After completing the exterior and interior inspections prior to slideout operation, next:

1. Put the motorhome transmission in PARK and:
 - a. Diesel Class A motorhome: apply PARKING BRAKE (engine must be running).
 - b. Gas Class A motorhome: apply PARKING BRAKE (engine must be OFF, and keys removed from ignition).
 - c. Class C motorhome: apply PARKING BRAKE (engine must be OFF, and keys removed from ignition).

2. Turn the battery disconnect switch ON.
3. Locate the slideout operating switch and:
 - a. Hydraulic slideout: press and hold the slideout operating switch until the slideout room is fully extended. Then release switch.
 - b. Electric slideout: extend the slideout out and hold the switch for an additional 3-5 seconds (this allows the slide motors to amp out).

Note: There is a 30 second delay feature on the tilt a bed rear bed slideout (if so equipped), to allow time to raise the head of the bed.
4. After the room is fully extended, immediately release the button. Failure to do so could cause damage to the slide assembly.

Retracting the Slideout

Use the same safety precautions as previously stated for extending the slideout, and:

1. Be sure there are no obstructions on the floor of the coach or in the path of the room as it is coming in.
2. Ensure there is no visible dirt or debris in the track of the slideout or under it. Trapped dirt or debris could cause damage to your carpet or floor.
3. Locate the slideout operating switch and:
 - a. Hydraulic slideout: press and hold the switch until the room is completely retracted, then immediately release the switch.
 - b. Electric slideout: Fully retract the room, and hold the switch for an additional 3-5 seconds (until the motors amp out). Then immediately release the switch.
4. Install the slideout locking devices (if so equipped.).

NOTE: Always check and remove debris on the roof of the slideout and awnings before retracting.

NOTE: Always perform an interior and exterior visual inspection before leaving the campground or traveling.

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Appliances

⚠ DANGER

Do not use gas cooking appliances for comfort heating.
Can lead to carbon monoxide poisoning, which can lead to death or serious injury.

⚠ WARNING

Gas cooking appliances need fresh air for safe operation. Before operating:

- Open vents or windows slightly or turn on exhaust fan prior to using cooking appliance.
- Gas flames consume oxygen, which should be replaced to ensure proper combustion.
- Improper use can result in death or serious injury.

⚠ WARNING

Range covers must be open when the surface burners are in operation.

⚠ WARNING

WHEN USING THE OUTDOOR COOKING AREA:

- The vehicle must be level and stabilized
- Do not violate manufacturers' instructions on required clearances for cooking appliances during use
- Do not store cooking appliances until cool to the touch
- Can lead to a fire and explosion and result in death or serious injury



Typical range and microwave



Typical stacked washer/dryer

NOTE: Always turn OFF the air conditioner, furnace, and all electrical appliances before disconnecting the shore line power cord from the 120 volts AC power source or shutting OFF the generator.

WHEN INSTALLING CLOTHES DRYER IN THIS CLOSET

REFER TO APPLIANCE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR:

- a) DRYER TO BE LISTED BY THE APPLIANCE MANUFACTURER AS "SUITABLE FOR INSTALLATION" IN CLOSET LOCATIONS.
- b) VENTILATION OPENINGS (FRESH AIR) TO BE SIZED PER INSTALLATION INSTRUCTIONS.
- c) EXHAUST DUCT TO BE INSTALLED AND SIZED PER INSTALLATION INSTRUCTIONS.

NOTE: DUE TO VARIATIONS OF DRYER MANUFACTURERS, NO DRYER VENT FRAMING HAS BEEN INSTALLED. REMOVE THIS PANEL TO COMPLETE THE DRYER VENT INSTALLATION.

DA2182

Typical dryer label (if so equipped)

Please refer to the specific appliance component manufacturer's owner's manual that came with your Owner's Packet. It will detail the product installed in your motorhome. If you feel it is missing please have the brand, model, and serial number of your specific appliance available before contacting your selling dealership for assistance in obtaining a replacement. For your convenience, many appliance manufacturers have their owner's manuals available for download from their respective websites.

Each appliance in your motorhome is warranted by its own manufacturer. It is very important that you review ALL the literature provided in your Owner's Packet. Fill out and mail any warranty registration cards as required by the appliance manufacturers. Please contact your selling dealer, TMC Customer Care, or the appliance manufacturer if you have any questions regarding the operation, maintenance, or safety of the appliances in your motorhome.

Heating/Cooling

Different factors affect the ambient temperature inside your motorhome. The purpose of a thermostat is to keep the air temperature at the level you have selected. Please refer to the air conditioner and furnace manufacturer's instructions for operation, safety, and maintenance instructions.

Entertainment System

Due to the large selection of televisions, DVD's, stereos, sound bars, and other components that may be integrated into your motorhome's entertainment system, it is impossible to list all of them in this manual. For more detailed information regarding a specific component installed in your motorhome please refer to the respective component manufacturer's owner's manuals included in Owner's Packet. Or for your convenience, many component manufacturers make their literature available for download from their respective websites.

NOTE: Turn your TV antenna booster **ON** while watching local television stations; shut the TV antenna booster **OFF** when watching cable or satellite.

Sleeping Areas

⚠ WARNING

The sleeping accommodations in this vehicle are designed for occupancy only while the vehicle is **NOT** in motion. All occupants in this vehicle must be seated at a designated seating position and must wear seat belts at all times while this vehicle is in motion. Failure to do so can result in serious injury.

Front Cab Power Drop Down Overhead Bunks (if so equipped)

⚠ CAUTION

BEFORE OPERATING ELECTRIC BED:

- Remove travel locks and recline driver and front passenger seat backs
- Lower bed completely before use
- **USE TRAVEL LOCKS WHENEVER BED IS IN THE RAISED POSITION.**



Typical keyed bed lift safety switch



Typical safety lock pin for cab bed lift

To lower the front cab powered drop down overhead bunk:

1. Turn the chassis engine OFF
2. Engage the PARKING BRAKE
3. Turn ON the master battery disconnect switch
4. Remove the travel locks (or pins)
5. Fully recline the driver's and passenger's seat backs
6. Some systems (if so equipped), require a secondary master power key be turned ON prior to operation
7. Engage the operating switch to raise or lower the overhead bunk

To raise the front cab powered drop down overhead bunk:

1. Raise overhead bunk until it stops, then press and hold the control switch for 3 additional seconds
2. Install the travel locks (or pins)
3. Lower the overhead bunk down onto travel locks (or pins), and press and hold the control switch for another 3 seconds

The overhead bunk must be completely raised and secured in the travel position before driving the motorhome. Always travel with the driver and passenger seats in the fully upright (non-reclining) position.

Rear Garage Elevated Beds (if so equipped)

⚠ CAUTION

The rear garage elevated bed(s) must be stowed and properly secured in the up position during travel.

⚠ CAUTION**XXX LBS. MAX LOAD CAPACITY FOR THIS TWO PERSON BED**

- **Failure to comply with the load capacity could cause bed failure which can result in injury**
- **Elevated beds can present a fall hazard which may result in injury. Please consult the Owner's Manual for more information regarding elevated beds and the use of bed rails**
- **Beds are not to be occupied during travel**

Some TMC motorhome models are equipped with built-in elevated beds or bed lofts in the garage area. These beds can be upwards of 4' (foot) to 5' (foot) above the floor level and are often enclosed on one, two, or three sides and sometimes even partially on a fourth side. Because there are so many potential occupants and different types of elevated bed designs, elevated beds are not equipped with bed rails.

Electric Bed Lift Systems

Some model year, makes, and models come equipped with electric bed lift systems in the garage. The bottom beds in some models can also be converted to dual sofas. Again, similar to the built-in elevated beds, because of the design and the various uses rear electric beds are not equipped with a bed rail system.

Use of Bed Rails

We feel that you, as the customer, are best equipped to determine if a bed rail system is necessary or best for you based on your intended uses, the actual occupants of the elevated beds, and their comfort level. For those customers who would prefer using an elevated bed with a bed rail, there are numerous bed rail styles, sizes, heights, and designs available, even in the style of bumpers, which can be purchased at various retail locations and/or on the internet.

When installing a bed rail make sure you follow the manufacturer's installation instructions carefully, and take in to account the size and height of the mattress (either originally installed by TMC or later replaced by you) so that the rails are the appropriate height above the top of the mattress. This is important because residential mattresses differ in size from RV mattresses. Make sure the bed rail you select allows for adequate room to get in and out of the elevated bed after installation, especially in the event of an emergency.

TIPS FOR SAFE USAGE:

- Please use sound judgment when allowing children to sleep in any style of elevated bed. Generally, it is not suitable for children under the age of 6 to sleep in an elevated bed or bed loft area.
- Discuss proper usage of any elevated bed/electric bed lift system with your children and make sure they are supervised if playing in the bedroom/sleeping area of the motorhome with elevated beds. Please do not allow horseplay on or under the elevated beds and no items such as hooks, belts, jump ropes, or towels should hang from any part of the elevated bed.
- Place a night light in the bedroom/sleeping area so occupants can see at night when getting in and out of the beds.
- No more than one person should be in an elevated bed at once and make sure you follow the weight restrictions posted on the warning label near the beds.
- Do not allow children to operate the rear cargo area electric bed lift systems in Toy Haulers. The lowering and raising of the electric beds should be only conducted by an adult. No person should be on the electric beds when being lowered or raised.

If you have any questions about elevated beds, Toy Hauler electric bed lift systems, or bed rails please contact TMC Customer Care at: [\(877\) 855-2867](tel:877.855.2867) for assistance.

Storage Compartments

WARNING

CARBON MONOXIDE OR SUFFOCATION DANGER EXISTS

This is a storage area only and not intended for human or animal occupancy. Failure to follow these instructions could lead to injury or death.

Do not allow children to enter or to play in or around this storage area.

This area is not heated or cooled. Do not store perishables or items in this cargo area that may be damaged by heat or by exposure to cold temperatures.

WARNING

LOAD LIMIT XXX LBS. MAXIMUM CAPACITY. Distribute the weight and do not overload.

WARNING

If your motorhome has a side-vented drainage system and you connect to a campground sewage hookup, be sure to keep the drain valve closed. Failure to do so may result in sewer gases being vented outside your motorhome and into the atmosphere.

⚠ WARNING

When closing the compartment storage doors, make sure that hands and fingers are clear of pinch points. Make sure all compartment doors are completely closed and latched, and all contents are properly secured prior to moving the motorhome.

When storing items in the compartment bays, do not overload them with heavy packed items. Remember that any weight added to the motorhome affects the overall weight of the vehicle. Ensure that the side-to-side weights are comparable, and the load distributed evenly. Please refer to Section 4 "Weighing, Loading, and Towing."

Exterior Ladder

⚠ WARNING**LADDER CAPACITY IS 250 lbs. MAXIMUM**

- **Exceeding the maximum capacity can lead to ladder collapse and possible personal injury**
- **Always face ladder and use both hands to climb slowly**
- **Always wear shoes that provide good traction. Failure to comply can result in a fall hazard and result in a personal injury**

Where equipped, the exterior rear ladder provides access to the roof for inspection and maintenance of the roof and roof mounted items only:

- When ascending and descending the ladder, ensure the ladder is clear of debris, such as water, ice, and other slippery substances.
- Always wear shoes that provide good traction, and do not wear sandals or other types of slip-on footwear when ascending or descending the ladder.
- Take the ladder into consideration when backing up or parking your motorhome.

Roof

WARNING

DO NOT CLIMB ON OR WALK ON THE ROOF WHILE WET. THE ROOF COULD BE VERY SLIPPERY CAUSING YOU TO FALL, WHICH CAN RESULT IN SERIOUS INJURY OR DEATH. DO NOT USE THE ROOF AS AN OBSERVATION PLATFORM OR STORAGE AREA, AS IT IS NOT DESIGNED FOR THESE PURPOSES.

TMC motorhomes have plywood reinforced roofs which are strong enough to walk on. Use the exterior ladder to climb up on the roof to inspect and maintain the roof, roofing seals, and roof-mounted components.

Awnings

CAUTION

IF THREATENING WEATHER APPROACHES, YOU NEED TO RETRACT ALL AWNINGS. If the awnings are rolled up wet, open them back up as soon as possible to allow them to dry. Do not drive during periods of high winds. Doing so may cause damage to the awning. Any damage to the awning caused by driving under such conditions will not be covered under warranty.

Patio Awnings

CAUTION

IN THE EVENT OF POWER LOSS OR AWNING MOTOR FAILURE THE AUTOMATIC PATIO AWNING CAN BE RETRACTED (REFER TO THE COMPONENT MANUFACTURER'S OWNER'S MANUAL). If you do not feel comfortable performing this procedure, contact the nearest authorized service center for assistance. Do not drive the motorhome with the awning in the extended position.

NOTE: Do not press more than one awning **EXTEND** or **RETRACT** button at the same time. The awning will not work and doing so may cause control box fuse (if so equipped) to blow.

TO EXTEND THE AWNING

Press and hold the remote switch, located near the entrance door, in the extend position until the awning is fully open. (Or utilize the remote control, if so equipped.)

TO RETRACT THE AWNING

Press and hold the remote switch in the retract position. Release the switch when awning is fully closed.

Ramp Door (if so equipped)

WARNING

Make sure there are no obstructions when raising, lowering or using the ramp door. Keep all people and pets clear of the motorhome while operating the ramp door. Always visually confirm the ramp door is shut and locked in the travel position before moving the motorhome. Moving the motorhome while the ramp door is lowered to the ground or in the patio position could cause damage to the ramp door and the motorhome.

There are several ramp door configurations, depending on your motorhome model year, make, and model. Each ramp door has a load limit weight rating label, set and affixed by the ramp door manufacturer. If you have questions regarding the operation or maintenance of your motorhome ramp door, please contact your selling dealer or TMC Customer Care at [\(877\) 855-2867](tel:877-855-2867).

Sealants

The exterior shell of the motorhome is the primary weather and moisture barrier. Over the life of the motorhome, the shell will require regular care and maintenance. The shell includes the roof, sidewalls, windows, doors, and under carriage of the motorhome. Regular inspections are required to ensure these components are maintained to ensure a tight barrier against bulk water intrusion.

The shell should be inspected periodically for tears, gaps, and condition of sealants. Areas that require maintenance should be resealed utilizing a proven, high quality sealant of similar characteristics as the original sealant.

Particular attention should be devoted to ensure the slideouts are functioning properly. Each time a slideout is used, it should be inspected to ensure proper operation and sealing. The slideout gaskets should also be inspected to ensure proper sealing when the slideout is operated.

Storage of the Motorhome

During those periods when your motorhome is not in use, care must be taken to ensure moisture sources are addressed. The ideal storage of your motorhome would be in an enclosed, climate controlled environment. If this is not possible, the following steps should be taken to help ensure moisture control:

- Turn OFF and disconnect from all water sources
- Turn OFF all combustion appliances
- Drain all holding tanks
- Drain the water heater
- Winterize your motorhome if in winter months
- Open all closets, cabinet doors, and drawers
- Close all windows and interior entrance doors
- Open a roof vent enough to allow for some limited ventilation air flow, but not so far as to allow snow or rain to enter

When storing the motorhome in high humidity climates (where ambient relative humidity is greater than 60% year round) use a (customer supplied) dehumidifier (drained to the exterior) to control humidity inside the motorhome during storage.

NOTE: Damage caused by lack of sealant maintenance is not covered under the Thor Motor Coach Limited Warranty. Refer to Maintenance Schedule.

Maintenance Schedule

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ITEM	EVERY TRIP	EVERY MONTH	EVERY 3 MONTHS	EVERY 6 MONTHS	EVERY YEAR	PRIOR TO STORAGE	AS REQUIRED	PROCEDURE TO BE PERFORMED: Maintenance schedules are minimum requirements. Heavy use, unusual temperatures or humidity, or other extreme conditions may require more frequent maintenance.
Roof & Components				x		x	x	Inspect & reseal roof & exterior attachment areas
			x					Clean roof
					x		x	Lubricate roof vent mechanism with light oil; Clean as needed
Fiberglass Exterior		x						Wash with warm water & mild detergent
					x			Wax with liquid or nonabrasive wax
Windows & Doors		x						Check vinyl seals when washing exterior
			x					Check seals for damage & repair as needed
			x					Lubricate door hinges & step components with spray grease
					x			Adjust & lube with graphite or light oil
					x			Lubricate door locks & strike pockets, exterior components
Seals & Adhesives		x						Inspect and reseal if necessary
Propane System					x		x	Check for leaks and damage
					x			Check line pressure; should be checked by a qualified technician
Water System		x						Check hoses, fittings & connections for leaks
	x							Check drainage system for leaks
					x	x	x	Sanitize & flush system
					x			Winterize system as needed
Electrical System		x						Check GFCI
							x	Perform maintenance procedures per generator owner's manual
							x	Check & service auxiliary and chassis batteries
							x	Add distilled water to auxiliary batteries as needed
Safety Equipment	x							Test smoke alarm, and combination carbon monoxide/propane alarm
	x							Test & check fire extinguisher

Maintenance Schedule

MAINTENANCE

ITEM	EVERY TRIP	EVERY MONTH	EVERY 3 MONTHS	EVERY 6 MONTHS	EVERY YEAR	PRIOR TO STORAGE	AS REQUIRED	PROCEDURE TO BE PERFORMED: Maintenance schedules are minimum requirements. Heavy use, unusual temperatures or humidity, or other extreme conditions may require more frequent maintenance.
Carpet	x							Vacuum after every trip
							x	Shampoo as needed
Fabrics & Upholstry							x	Clean per manufacturer's instructions
Weight & Distribution	x							Check for proper weight distribution per specifications
Chassis & Components							x	Per chassis manufacturer's owner's manual
	x							Check fluid levels including: oil, brake, washer, engine coolant, transmission, battery water, etc.
Tires	x							Inspect for wear & proper inflation
	x							Check all wheel lug nuts and tighten using a properly calibrated torque wrench (per chassis manufacturer's instructions)
Front Wheel Alignment							x	Inspect and align as needed
Seats							x	Lubricate mechanisms & inspect for proper operation
							x	Check all seat belt buckles, webbing & releases
Power Step			x					Clean & lubricate with spray lithium grease
Appliances							x	As required by appliance manufacturer

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Maintenance Log

MAINTENANCE

[illegible][illegible]

Fuel and Oil Log

MAINTENANCE

[illegible][illegible]

[illegible]

Notes

MAINTENANCE

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Glossary

GLOSSARY

AC (ELECTRICITY)

Alternating current also known as shoreline power. For purposes of this manual, it refers to 120 volts AC (abbreviated 120 VAC).

AMP

Short for ampere, the electric current unit of measure. RV sites with electric hookup will specify the maximum amps supported, which generally come in units of 20, 30, or 50 amps. The RV power connector must match the various plugs of the site amp rating.

ANODE ROD

Water heater component that draws corrosion-causing products away from the metal tank inside the heater. Aluminum water heater tanks feature a layer of anode metal and therefore don't require an anode rod.

AUXILIARY BATTERY

Extra RV battery kept on board to power 12 volts DC equipment.

AXLE RATIO

The number of revolutions needed to turn the axle once. Higher ratios mean higher torque and more towing power.

AWNING

A roof-like structure made of canvas or synthetic materials which extends from the RV body to provide shade. Awnings are generally placed over entrances. Some extend and stow manually while others are operated electrically.

BACK-IN SITE

A spot at a campground that requires backing in an RV as opposed to pulling through.

BACKUP MONITOR

A camera in the back of an RV that connects to a digital monitor in the dashboard to give the driver a better view of what's behind them, when reversing or when towing on the road.

BASEMENT

Storage compartments below the floor of an RV that can be accessed from outside.

BACKFLOW CHECK VALVE

A device designed to allow fluids to flow in only one direction.

BLACK WATER

Waste water from the toilet system. Black water stays in a holding tank until it is emptied at a dumping station.

BLACK WATER TANK

Holds toilet system waste water until it's emptied at a dumping station.

BLUE BOY/BUE-BOY

A portable holding tank for storing waste water. The tank is often distinguished by its blue color.

BOON DOCKING/DRY CAMPING/ PRIMITIVE CAMPING

Camping without electrical, water, or sewer hookups. Electricity is provided by batteries and generators, and water comes from the fresh water holding tank.

BRITISH THERMAL UNIT (BTU)

Measures the amount of energy needed to increase the temperature of one pound of water by one degree Fahrenheit. Used as a rating for RV air conditioners and furnaces.

BUMPER-MOUNT HITCH

Type of ball hitch that is either mounted or attached to the bumper of the tow vehicle. Can have limited RV applications.

BYPASS VALVE

Diverts fresh water from passing through the water heater.

CAB-OVER/OVER-CAB

Any portion of an RV that extends above the top of the tow vehicle's cab. Usually includes a sleeping area referred to as over-cab sleeping.

CAMBER (WHEEL ALIGNMENT)

The degree to which each wheel is off of vertical. Positive camber refers to when the tops of the wheels are farther apart than the bottoms. Heavier loads can create negative camber, which makes the bottoms of the wheels farther apart than the tops.

CARAVAN

Any group of RVs and RVers intentionally traveling together. They share the same route and communicate during the trip.

CAMPER

For purposes of this manual, this term refers to your motorhome.

CAMPING

An outdoor recreational activity involving the spending of one or more nights in a tent, primitive structure or RV at a campsite with the purpose of getting away from civilization and enjoying nature.

CAMPSITE

The term usually means an area where an individual or family might go camping.

CARBON MONOXIDE

A colorless, odorless, and poisonous gas.

CARGO CARRYING CAPACITY (CCC)

Equal to GVWR minus each of the following: UVW, full fresh (potable) water weight (including water heater), full propane weight and SCWR.

CARGO WEIGHT

The weight of everything the RV and/or tow vehicle is carrying.

CASTOR

Wheel alignment. If wheel alignment is off, the wheel will not automatically return to center after it is turned.

CHASSIS BATTERY

Battery that operates 12 volts DC components of an motorhome's drivetrain.

CITY WATER

Term associated with the water supply you hook up to at the campsite. It is called city water because water is pulled from a central outside source (like a city) and not the fresh water tank.

CONDENSATION

Moisture build-up that occurs when warm air meets cold window glass. Condensation can be reduced or eliminated by keeping a roof vent open and adding a roof vent cover to keep cold air from coming through the vent while still letting moist air escape.

CONVERTER

A device that converts 120 volts AC Alternating Current (AC) power into 12 volts Direct Current (DC) power.

COUPLER

Attaches the trailer to the ball of the hitch on the tow vehicle.

CURB WEIGHT

Actual weight of the tow vehicle or RV including all equipment and tanks, but excluding passengers and gear.

CURBSIDE

This refers to the side of the camper that faces the curb when parked. Also referred to as the door side or DS.

DC (ELECTRICITY)

Direct current also known as auxiliary battery power. For purposes of this owner's manual, it refers to 12 volts DC.

DEALER

For purposes of this manual, this refers to the independent dealer authorized to sell and/or service your camper by Thor Motor Coach. This term will be used in this context unless specified otherwise.

DIESEL PULLER or PULLER

Motorized RV with a diesel engine located in the front.

DIESEL PUSHER or PUSHER

Motorized RV with a diesel engine located in the back.

DINETTE

Dining booth featured in most RV types. Typically converts into extra seating or sleeping space.

DINGHY/TOAD

A vehicle towed by a motorized RV.

DISPENSING

As applied to gasoline or diesel fuel systems, withdrawing fuel from applicable recreational vehicle fuel tank(s) to other motorized vehicles or approved containers by means of a hose and hose nozzle valve.

DISTRIBUTION

As applied to gasoline or diesel fuel systems, the flow of fuel from the recreational vehicle fuel tank(s) to an onboard fuel-burning generator by means of a closed system of tubing or hoses.

DOUGHNUT/SEWER DOUGHNUT

Rubber ring that seals an RV's dump hose to the campsite sewer hookup so gases and odors don't escape. Doughnut seals are required at most campsites and hookup locations.

DRAIN TRAP

This is the curve that is in all drains. Water is trapped in the curve and creates a barrier so tank odors cannot escape through the drain.

DRY CAMPING

Camping when there is no city water hookup or shore power (i.e., using only the water and power available in the camper and not from any other source).

DRY WEIGHT

The weight of an RV without fuel, water, propane, passengers, or gear.

DSI (Direct Spark Ignition)

Method of lighting the burner of a propane-fueled appliance such as a refrigerator, furnace, stove, or water heater. An electric spark lights the burner and an electronic circuit board monitors the flame.

DUAL ELECTRICAL SYSTEM

Allows RVs to operate on 12 volts DC battery power when boondocking or dry camping, and on 120 volts AC power at campsites or with generators.

DUCTED A/C

A ducted system mounted in the ceiling of an RV that supplies cool air through vents.

DUCTED HEAT

A ducted system mounted in the floor of an RV that supplies warm air through vents.

DUMP/DUMPING STATION

A safe location, usually at a campsite, to empty black water and gray water holding tanks.

DUMP VALVE

Another name for the T-handle valve used to release and drain the black tank (sewage) and gray tank (waste).

EGRESS (EXIT) WINDOW

The formal name for the emergency escape window. Egress windows are identified by their labeling.

FRESH WATER SYSTEM

The fresh water system provides potable water to the fresh water tank, kitchen sink, shower, bathroom lavatory, toilet, water heater, and outside shower.

FRESH WATER TANK

A container that holds gallons of fresh water for use inside the RV (cooking, drinking, cleaning, etc.).

FUEL SYSTEM

Any arrangement of pipe, tubing, fittings, connectors, tanks, controls, valves, and devices designed and intended to supply or control the flow of fuel.

FULL HOOK-UP

Connections (usually at a campground) for electricity, water, and sewer.

FULL TIMERS OR FULL TIMING

People who spend most of their time living in their RV, or live in their RV exclusively.

GALLEY

Kitchen of an RV. Name is borrowed from the boating industry.

GENERATOR

An engine powered device that provides extra 120 volts AC power using gasoline, diesel fuel, or propane.

GENSET

Abbreviation for generator set.

GRAY WATER

Waste water from sinks and showers. Gray water is stored in a specific holding tank separate from fresh water and black water.

GRAY WATER TANK

Holds gallons of waste water from sinks and showers. Gray water tanks are emptied into larger tanks at campgrounds.

GROSS AXLE WEIGHT RATING (GAWR)

The maximum load weight (in pounds) one axle of the RV can handle.

GROSS COMBINED WEIGHT (GCW)

The combined weight of the tow vehicle and the RV.

GROSS COMBINED WEIGHT RATING (GCWR)

The maximum load weight (in pounds) of an RV and tow vehicle combined. GCWR includes the weight of the RV, tow vehicle, fuel and propane, holding tanks, gear, and passengers.

GROSS VEHICLE WEIGHT RATING (GVWR)

The maximum weight (in pounds) allowed for an RV, including fuel and propane, holding tanks, gear, and passengers.

HARD-SIDED

An RV that features walls constructed of aluminum or fiberglass, as opposed to an RV with soft-sided walls made of vinyl or other foldable materials.

HEAT EXCHANGER

Transforms fuel into heat. Propane flame and ignition devices are included inside the heat exchanger. When air is blown over the exchanger, it is warmed and then blown through the ducts of the heating system. Combustion gases are vented outside the RV.

HEAT STRIP

An electric heating element in the air conditioning system that helps regulate the temperature of the air.

HITCH

The fastening unit that joins a movable vehicle to the vehicle that pulls it.

HITCH RATING

The weight a towing hitch is designed to handle.

HITCH WEIGHT

The weight that is placed on the towing hitch. Ideally, hitch weight should be between 10% and 20% of the total weight of the RV, depending on the RV type.

HOLDING TANKS

Storage for fresh water, gray water, and black water. All types of water are stored and emptied separately from one another.

HOOKUPS

Electricity, water, and sewer systems an RV can draw from/hook into, usually at a campground. Full hookup includes all three systems available.

HOUSE BATTERY

One or more batteries in a RV for operating the 12 volts DC lights, appliances, and systems. House batteries can be 12 volts DC units tied in parallel or pairs of 6 volt batteries tied in series (to double the voltage). The term house battery is of more significance in motorhomes because they contain one or more other batteries for the operation of the engine, referred to as the chassis or starting batteries.

INVERTER

Transforms 12 volts DC battery power into 120 volts AC power. Can be used when boondocking to power certain devices like microwaves.

HULA SKIRT

A guard placed on the back bumper to protect the RV from debris thrown up by the rear wheels.

LAMINATE

A sandwich of structural frame members, wall paneling, insulation, and exterior covering, adhesive-bonded under pressure and/or heat to form the RV's walls, floor, and/or roof.

LANDING GEARS

See Leveling Jack.

LEVELING

Using ramps or jacks to ensure a towable RV is level when parked and/or unhitched at a campsite.

LEVELING JACK

A jack lowered from the underside of motorhomes for the purpose of leveling the vehicle. A leveling jack is designed to bear a significant portion of the RV's weight.

LOW POINT

The lowest point in the plumbing. Drains are placed here so that water will drain out of the lower end of the camper when flushing or winterizing the water system. These drains must be closed when you fill the water tank.

LP GAS or PROPANE

Liquid Petroleum Gas is used to fuel appliances such as stoves, ovens, water heaters, refrigerators, and furnaces.

MOTORCOACH/MOTORHOME (MH)

A motorized RV built on the same type of chassis found on commercial buses.

NET CARRYING CAPACITY (NCC)

The maximum weight of fuel and propane, holding tanks, passengers, and gear an RV can hold without exceeding its Gross Vehicle Weight Rating (GVWR).

NON-POTABLE WATER

Any water not suitable for consumption.

OEM

An acronym referring to the original equipment manufacturer of the individual appliance or component.

OVERFILLING PREVENTION DEVICE (OPD)

A safety device that is designed to provide an automatic means to prevent the filling of a container in excess of the maximum permitted filling limit.

OVERFLOW AREA

Designated portion of a campground used when all the standard RV campsites are taken. Often includes fewer amenities and hookups.

PART TIMERS

People who do not live in an RV full time, but do take extended trips each year.

PERIODICALLY

At least once each camping season, more often if you camp frequently.

PILOT or PILOT LIGHT

The flame used to light the burner of a propane-fueled appliance such as a stove, furnace, refrigerator, or oven.

PLUMBING VENT

Any pipe provided to ventilate a plumbing system, to prevent trap siphonage and back pressure, or to equalize the air pressure within the drainage system.

PORPOISING

The up and down pattern of motion experienced in an RV while on the road.

POWER SOURCE

Also referred to as shore power, this refers to the receptacle outlet you are using to plug in your shore line power cord. This can be a campsite power box or electrical box, a residential receptacle outlet specifically wired for your camper or a generator (customer supplied).

PRIMITIVE SITE

A campsite that may have city water, shore power or sewer hook-ups but not all of them; primitive sites may have no hook-ups or connections at all.

PROPANE

LPG, or liquefied petroleum gas, used in RVs for heating, cooking, and refrigeration. Also called bottle gas, for manner in which it is sold and stored. This is the proper term in the RV industry when referring to “LP Gas.”

PULL-THROUGH SITE

A campground that allows an RV to enter from one side and leave from the other, eliminating the need to back the RV out of the site.

RATING

The maximum limits of a tow vehicle or RV as determined by the manufacturer.

RECEIVER

The part of the hitch into which the hitch bar is inserted.

REEFER

Slang for “refrigerator”. Refrigerators are often found in either a “two-way” or “three-way” operating mode. Two-way: has a gas mode and an AC mode. Three-way: has a gas mode, AC mode, and 12 volts DC mode. The coolant used in RV refrigeration is an ammonia-based compound.

RIDE HEIGHT

Distance between the ground and a specific point on an RV or tow vehicle when the tires are properly inflated.

RIG

Slang many RVers use to refer to their RVs.

Guides, articles, blogs, etc., to help you learn the ins and outs of RV life.

ROADSIDE

This refers to the side of the camper that faces the road when it is parked. Often called the off-door side.

ROOF AIR CONDITIONING

Air conditioning system mounted to the roof of an RV and typically used when the RV is parked.

RV

Short for recreational vehicle. Encompasses many different types, from motorized to towable.

RVDA

Abbreviation for Recreational Vehicle Dealer's Association.

RVIA

Abbreviation for Recreational Vehicle Industry Association.

SAFETY CHAINS

Keep the RV and tow vehicle attached to each other in case of hitch failure.

SANITIZATION

Refers to the camper's fresh water system that has been sanitized with chlorine bleach before use or after storage.

SCREEN ROOM

A screened-in area that attaches to the exterior of an RV that serves as a sort of porch or patio.

SELF CONTAINED

An RV that includes the basic necessities needed for boondocking or dry camping without electrical, water, and sewer hookups for short periods of time. Self-contained RVs usually include fresh water tanks, batteries, and generators.

SEMI-MODERN CAMPING

Camping with some hookups, but not all. Typically means camping with just electricity.

SHORE POWER

Electricity from a source other than the RV's batteries. Can include power from a generator or electricity hookup.

SLIDEOUT

A portion of an RV that can slide outward to provide more interior space when the RV is parked.

SOFT-SIDED

RV walls made of vinyl or other foldable materials as opposed to aluminum or fiberglass. Soft sides are found in pop-up campers and RVs with expandable sections.

SNOWBIRD

Term for someone in a northern climate that heads south in winter months.

STREETSIDE

The part of the vehicle on the street side when parked. (Also referred to as the off door-side or ODS.).

SURGE PROTECTOR

Device (customer supplied) that is installed at the power supply location designed to prevent "surges" or "spikes" in electrical current that may damage the RV's electrical/electronic components.

TAILGUNNER

The last RV in a caravan of RVers.

THERMOCOUPLE

A thermocouple is a device that monitors the pilot flame of a propane-fueled appliance. If the pilot goes out, the thermocouple shuts the gas valve to stop the flow of propane to the pilot and the main burner.

THREE-WAY REFRIGERATOR

An RV refrigerator or freezer that can operate on propane gas, 120 volts AC, or 12 volts DC electricity.

TIP OUT

The term used for an area or room in an RV that tips out for additional living space. The Tip-Out was generally used in older RVs. Newer RVs mainly use a slideout.

TIRE RATINGS

The MAXIMUM LOAD that a tire may carry is engraved on the sidewall, along with a corresponding COLD inflation pressure. A reduction in inflation pressure requires a reduction in load rating. Tire manufacturers publish charts that establish the load capacity at various inflation pressures.

TOE (WHEEL ALIGNMENT)

Toe is the measure of whether the front of the wheels (looking down from the top) are closer (toe-in) or farther (toe-out) than the back of the wheels.

TONGUE WEIGHT, TONGUE LOAD, VERTICAL LOAD (TWR/TLR/VLR)

The downward force the RV coupler exerts on the hitch ball. Ideally, tongue weight is 10% to 15% of Gross Trailer Weight (GTW).

TOW RATING

The maximum weight that a vehicle can tow. Usually related to overall RV weight and not size.

TOW VEHICLE

Used to tow an RV. Some RVs require trucks as tow vehicles, while others can be towed with lighter vehicles.

UNDERBELLY

The exterior floor of the RV, typically protected by weatherproofed material.

UNLOADED VEHICLE WEIGHT (UVW)

The weight of an RV without fuel or propane, water, passengers, and gear.

UTQGL (UNIFORM TIRE QUALITY GRADE LABELING)

A program that is directed by the government to provide consumers with information about three characteristics of the tire: tread wear, traction, and temperature. Following government prescribed test procedures, tire manufacturers perform their own evaluations for these characteristics. Each manufacturer then labels the tire, according to grade.

UV DEGRADATION

A breaking down of material due to the sun's harsh ultraviolet rays.

WASTE WATER TANKS

Holding tanks for gray water and black water, including the waste from sinks, showers, and toilets.

WATER PRESSURE REGULATOR

Device (customer supplied) installed on the water hose attached to city water to limit the water pressure entering the RV. Most regulators limit water pressure to 40 psi.

WEEKENDERS

People who own their RV's for weekend and vacation use.

WEIGHT & LOAD

These terms are generally used interchangeably. For the purposes of understanding RV applications, vehicles have WEIGHT, which impart LOADS to tires, axles, and hitches. Scale measurements taken when weighing are LOADS carried by the tires. These measured loads are used to calculate Gross Vehicle Weight (GVW), Gross Axle Weight (GAW), Gross Combination Weight (GCW), and hitch loads.

WEIGHT-CARRYING HITCH/DEAD WEIGHT HITCH

A hitch that bears the entire hitch weight of the RV.

WET WEIGHT

The weight of an RV when fuel and fresh water tanks are full.

Note:

- Propane weighs 4.25 pounds per gallon
- Water weighs 8.3 pounds per gallon
- Gasoline weighs 6.3 pounds per gallon
- Diesel fuel weighs 6.6 pounds per gallon

WINTERIZED

Preparing an RV for winter/cold weather use or outdoor storage.

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