OWNER'S MANUAL

CLASS B
MOTORHOMES

THOR MOTOR COACH

Made to fit.

⚠ 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

THOR MOTOR COACH

Made to fit.

Congratulations on purchasing your new motorhome! Welcome to the wonderful world of RV'ing and to the Thor Motor Coach family of recreational vehicles.

We sincerely thank you for choosing the Thor Motor Coach brand. Our mission is to produce quality motorized recreational vehicles designed to provide you with carefree, comfortable travel and vacationing for now and for many years to come. We are confident that you will find your new motorhome is 'Made to fit' your recreational aspirations.

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 at the time of manufacture.

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

Happy Travels!

P.O. Box 1486 • Elkhart, Indiana 46515-1486 • 877.855.2867 • thormotorcoach.com

TMC Class B Owner's Manual Part Number 0511662 Revision 12/01/2021

Table of Contents

CLICK ON PAGE NUMBERS

CLICK ON PAGE NUMBERS

CLICK ON PAGE NUMBERS

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Introduction

About This Owner's Manual

This Owner's Manual is intended to introduce you to the basic features of your new motorhome. It is not intended for use as a service manual, nor does it provide complete operational instructions. It is a guide to help you become familiar with the safe operation and use of your motorhome. It is general in nature, so the illustrations and descriptions provided may differ from the components installed in your motorhome. Please read and keep it, along with your TMC Warranty Guide, your Owner's Packet, and your Chassis Packet in your motorhome for future reference.

Information regarding the specific systems and components of your motorhome is provided in other TMC publications, media, and services. These resources include: TMC System Guides, component manufacturers instructional booklets, TMC-produced how-to videos, and through TMC's Customer Care representatives, who are available 24/7 to answer your questions and assist with your concerns.

A list of component suppliers is available through the Thor Motor Coach Owners Resource document service.

TMC Warranty Guide

The Thor Motor Coach Class B Limited Warranty is printed and available in your TMC Class B Warranty Guide. The TMC Class B Warranty Guide also contains your TMC Product Warranty Registration Form.

The TMC Product Warranty Registration Form must be completed by you and your selling dealer, and returned to TMC within 15 days of delivery of your new motorhome to you.

Owner's Packet

For complete instructions regarding warranty, safety, operation, and maintenance of the components installed in your motorhome, please read and follow the information provided by the various component manufacturers included in your Owner's Packet.

TMC Owner's Packet

If you are missing component information, please contact the component manufacturer (using the supplier contact list provided through the TMC Owners Resource), your selling dealer, or TMC Customer Care at:

877-855-2867

Chassis Packet and Chassis Warranty

Supplied by the manufacturer of your motorhome's chassis, the Chassis Packet contains important warranty, safety, operation, and maintenance information pertaining to the motorized vehicle portion of your motorhome. Instructions for registering your applicable warranty using the chassis manufacturer's Delayed Warranty Start Form are printed in the TMC Warranty Guide.

Contact TMC Customer Care

If you are unclear or unfamiliar with any procedure described in this Owner's Manual, your TMC Warranty Guide, Owner's Packet, Chassis Packet, the operation of a component or system of your motorhome, or require service or warranty repairs, please contact your selling dealer or TMC Customer Care at:

877-855-2867

TMC Customer Care representatives are available 24 hours a day, 7 days a week.

If you are contacting TMC's Customer Care by email, response times are within 1 to 2 business days. You must include your name, phone number, a valid email address, along with your 17-digit Vehicle Identification Number (VIN) and a brief description of your inquiry.

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 motorhome ownership. Specific operational and maintenance instructions for the systems and factory-installed components of your motorhome may not be included in this manual, however, specific information associated to your motorhome is available on-line through the TMC website:

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

From the web-page listed above, click on the icons that will direct you to resources such as: TMC Owners Resource, TMC Customer Care, authorized TMC service center locator, TMC factory parts, TMC owner's manuals, and other useful and informative information.

TMC Owners Resource

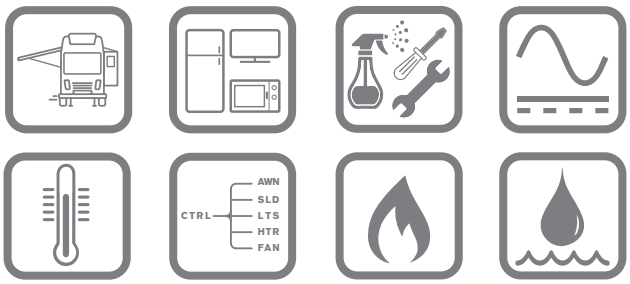
Clicking on the Owners Resource icon will direct you to the TMC Owners Resource document service. This service is complementary to owners of TMC motorhomes. Create a user account by entering your contact information and your motorhome's 17-digit Vehicle Identification Number (VIN). The site will return to you a list of instructional manuals, quick-start guides, and links to instructional videos associated to your motorhome's factory installed systems and components. Documents are provided in a viewable, printable, and downloadable .pdf format. Visit your TMC Owners Resource account often, for updates and new features are continually being introduced.

TMC System Guides

A good source of operational and maintenance information pertaining to TMC motorhomes is available through TMC's System Guides. System Guides are intended to inform TMC motorhome owners about the systems and components installed on their motorhome. System Guides are continuously updated as new features and components are added to the TMC model line-up. System Guides are available as download-able .pdf documents from the TMC website through your TMC Owners Resource account.

To date, guides are available covering these topics:

- Awnings, Leveling and Slideouts
- Appliances and Entertainment
- Care and Maintenance
- Electrical System
- HVAC (heating and air conditioning)
- Multiplex System
- Propane System
- Water System (Fresh and Waste)



NOTE: Available to Class B motorhome owners is the TMC Class B Supplement, which provides component instructions in more detail than what is described in this manual. Download the Class B Supplement through your TMC Owners Resource account.

TMC Instructional Videos

As an added bonus, TMC provides informative 'how-to' videos on the Thor Motor Coach YouTube channel. This video library is constantly being updated and includes helpful information regarding the operation and maintenance of the systems and components installed on your motorhome:

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

For your convenience, instructional videos are also listed and linked from your TMC Owners Resource account.

Consumer 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 pre-delivery inspection (PDI).

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 of your new motorhome's operation, safety features, and maintenance requirements.

At the time of purchase, your selling dealer should discuss this Owner's Manual, the Owner's Packet, the Chassis Packet, the TMC Warranty Guide, including TMC's Limited Warranty. Their presentation should include assisting you with completing all warranty cards and registrations, and reviewing all component information, including warranty, safety, operation, and maintenance information relating to your new motorhome.

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 15 days of delivery of your motorhome to you. The Thor Motor Coach Limited Warranty is activated on the date of delivery of the new motorhome to its new owner(s).

NOTE: Failure to file the Product Warranty Registration Form with TMC will not affect your rights under the applicable TMC limited warranty, as long as you can present proof of purchase and proof of delivery date to TMC, but it can cause delays in obtaining the benefits of the applicable TMC limited warranty, and it may inhibit any servicing facility's ability to provide proper repairs and/or part replacement.

All agreements between your selling dealer and TMC are for the benefit of the selling dealer and TMC only. Third parties, including retail buyers of motorhomes, are not third beneficiaries of the Agreements, nor may they enforce the terms of the Agreements.

Consumer'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, TMC's On-line Customer Support, the Chassis Packet, and all individual component suppliers' information. The Thor Motor Coach Limited Warranty does not cover periodic maintenance.

If you have questions regarding warranty coverage, contact TMC Customer Care at:

877-855-2867

AT THE TIME OF PURCHASE:

1. Inspect the entire motorhome during the test drive and pre-delivery inspection (PDI), and note any issues in writing on the TMC Product Warranty Registration Form. Ask any questions you may have before leaving the selling dealership.
2. At the time of purchase, read and indicate your acceptance of TMC's terms and conditions of the Thor Motor Coach Limited Warranty by signing, along with a representative of the dealership, the TMC Product Warranty Registration Form.
3. At the time of purchase, complete and return all applicable component warranty cards and registrations.
4. Perform regular and proper maintenance (refer to Sections 11 and 12). 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; its systems, features, and safe operational procedures. Follow all TMC, chassis manufacturer, and all individual component suppliers' instructions regarding safety, operation, and maintenance of their respective products.

NOTES:

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

Change of Address or Ownership

The 'National Traffic and Motor Vehicle Safety Act of 1966' for 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 owner, 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 (Attention: Registrations):

574-294-3618, 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 (home and/or cell)
- Your email address
- Your vehicle's 17-digit 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

Vehicle Identification Decals and Plates

The vehicle identification number (VIN) and the TMC serial number is listed on a label affixed to the inside of the driver's doorjamb of a Class B and C motorhome. Please refer to the chassis manufacturer's owner's manual for the location of your 17-digit chassis VIN tag (see Section 5).

How to Obtain Assistance

Should a question or concern arise regarding your motorhome, the first step is to contact your selling dealer. Their sales, service, and parts professionals will be glad to assist you.

You can also contact a TMC Customer Care representative by calling:

877-855-2867

Representatives are available 24 hours a day, 7 days a week.

If you leave a voice-message, please include your name, your telephone number, your VIN, and briefly describe the purpose of your inquiry. You will receive a returned phone call from a TMC Customer Care representative as soon as possible.

Your selling dealer and/or your TMC Customer Care representative should be able to solve any question or concern regarding your motorhome. However, if their combined efforts are not satisfactory, please send a letter describing the circumstances to:

Thor Motor Coach
Attn: Customer Care
P.O. Box 1486
Elkhart IN 46515-1486

INCLUDE THE FOLLOWING:

- Your selling dealer's name, address, and phone number
- Your legal name, current mailing address, phone number, and email address
- Your vehicle's 17-digit 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

The following suggestions will help ensure your selling dealer provides the level of service you expect.

CONTACT YOUR DEALER AT ONCE

Service appointments are made based on each dealer's service schedule, so contact your dealer as soon as possible to have service or repairs performed.

PREPARE FOR THE APPOINTMENT

If warranty-covered service work is being performed, have the following documentation available:

- TMC Warranty Guide
- Applicable component warranties
- Component serial numbers
- Vehicle identification number (VIN)
- Vehicle's TMC serial number

All work to be performed may not be covered by the TMC Limited Warranty or component manufacturer's warranties. Discuss warranties and possible service charges with the dealer's service professionals before authorizing service work.

PREPARE A LIST

Provide your dealer with a written list of specific repairs needed. It is important that you provide the vehicle's repair history to the dealer's service professionals. Keep a maintenance and service log for your vehicle and make it available for your dealer to review.

BE REASONABLE WITH YOUR REQUESTS

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

EXPECT LIMITED OR NO ACCESS TO THE SERVICE AREA

Please don't be offended if you are not allowed in the service area while the service work is being performed. Some insurance requirements forbid admission of customers to the service area.

INSPECT THE WORK PERFORMED

Along with the service manager or representative, inspect the service or repair work when you pick up your motorhome. Notify the dealer's service professionals immediately of any dissatisfaction with the performed service work. If you cannot return the vehicle immediately for repairs or corrections, 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 the policies of the repair facility.

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

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** (available 24/7) for warranty pre-repair authorization, and for emergency weekend or after-business-hours repair assistance (see How To Obtain Assistance, in this section).

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 TMC 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. TMC has a dumping station available for customer use.
- The propane system and all electrical systems must be shut down and turned OFF. TMC is not responsible for discharged batteries or loss of propane.
- During the appropriate season, please ensure your motorhome is winterized.
- You must retake possession of your motorhome within seven (7) business days of TMC notifying you that the repairs have been completed; otherwise, unless a longer storage time has been previously agreed to, in writing by TMC, you may be liable for additional daily storage fees payable to TMC.

Replacement Parts

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

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 its 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.

Thor Motor Coach® Recreational Vehicle Privacy Notice

Your Thor Motor Coach RV contains systems which allow Thor Motor Coach to collect information about your recreational vehicle, how it is used, and where it is located, and your Internet connection established through the RV's embedded equipment. Thor Motor Coach may also collect information about you, your RV, and how and where it is used through devices, applications, and services you use in connection with your Connected RV.

Some data, including location information, may be transmitted to Thor Motor Coach (directly or through its service providers) via the included Winegard modem/router whenever that device is connected to the Internet (via WiFi, cellular connection, or other means). This data may be transmitted regardless if your RV is parked or in motion.

Thor Motor Coach collects, uses, stores, and/or shares this data for a number of reasons, including providing assistance to you, troubleshooting, improving its products, and to offer you products and services which may be of interest to you.

For more information and updates about what information Thor Motor Coach may collect, how we use, store, and share it, and how we protect it, please review the Thor Industries Privacy Policy (www.ThorIndustries.com/privacy-policy/) and the Winegard Company Privacy Policy (www.Winegard.com/about/privacy-policy).

You may prevent sharing by disconnecting the Winegard modem/router from the electrical power source. Note: if you disable or limit information sharing with Thor Motor Coach or its partners certain product features may not work or may have limited functionality.

Thor Motor Coach RVs with connectivity features are intended for use in the United States and Canada only. Data and privacy protection laws where you use the RV may impose certain responsibilities on you with respect to your use of RV and related services. You are responsible for ensuring you comply with such laws when you use the RV and related services. You are responsible for informing those you permit to use or occupy your RV (with or without you, and including anyone to whom you loan, give, or sell the Connected RV) how data related to their use of the RV may be collected and processed.

If your Thor Motor Coach RV is equipped with a Sirius Radio receiver, TMC will forward your vehicle and contact information to Sirius. They will use this information to activate your subscription.

Please contact Thor Motor Coach Customer Service at **877-855-2867** if you have any questions about this privacy notice or our privacy practices.

Chassis Manufacturers Notice

Chassis manufacturers may equip their vehicles with a modem and antenna. This device is used to access important vehicle diagnostic information and may include other useful features. Refer to the manufacturer's owner's manual, or contact a manufacturer's dealership, or visit the manufacturer's website to obtain system information and vehicle privacy policies.

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: **888-327-4236**

TTY: **800-424-9153** or: **202-484-5238**

A NHTSA representative will record your complaint information.

TO CONTACT NHTSA BY MAIL:
Office of Defects Investigations/CRD
NVS-216
1200 New Jersey Ave. SE
Washington, DC 20590

TO CONTACT THOR MOTOR COACH BY PHONE:
Contact TMC Customer Care at: **877-855-2867**

TO CONTACT THOR MOTOR COACH BY MAIL:
Thor Motor Coach
Attn: Customer Care
P.O. Box 1486
Elkhart, IN 46515-1486

In Canada

If you believe your recreation vehicle has an alleged safety defect, you should contact the Department of Transport and Thor Motor Coach. to report your safety concern.

ONLINE:
www.tc.gc.ca/recalls

TELEPHONE:
Call: **800-333-0510** (in Canada) or: **819-994-3328**
(Ottawa-Gatineau area or International)

MAILING ADDRESS:
Transport Canada - ASFAD
330 Sparks Street
Ottawa, Ontario
K1A 0N5

TO CONTACT THOR MOTOR COACH BY PHONE:
Contact TMC Customer Care at: **877-855-2867**

TO CONTACT THOR MOTOR COACH BY MAIL:
Thor Motor Coach
Attn: Customer Care
P.O. Box 1486
Elkhart, IN 46515-1486

Langue Française

INTERNET :
http://www.tc.gc.ca/rappels

TÉLÉPHONE :
Sans frais : **800-333-0510** (au Canada)

ou : **819-994-3328**
(dans la région de Ottawa-Gatineau et à l'extérieur du pays)

ADRESSE POSTALE :
Transports Canada - ASFAD
330, rue Sparks
Ottawa (Ontario)
K1A 0N5

POUR JOINDRE TMC PAR TÉLÉPHONE :
Appelez l'assistance à la clientèle TMC au :

877-855-2867

POUR JOINDRE TMC PAR COURRIER :
Thor Motor Coach
Attn: Customer Care
P.O. Box 1486
Elkhart, IN 46515-1486

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Vehicle Safety

Safety Alerts

Thor Motor Coach uses the following safety symbols and 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 important information and useful tips.

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.

Safety Decals and Information Labels

⚠ WARNING

Do not remove manual or labels from RV. If manual is lost or misplaced or labels are damaged or illegible, contact manufacturer or go to manufacturer's website to obtain replacements. Thor Motor Coach, Inc's website is: http://thormotorcoach.com.

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.

NOTE: Replacement Owner' Manuals and labels can be obtained from your selling dealer's parts department or TMC Customer Care.

Fire Safety

⚠ DANGER

NO SMOKING

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

Do not dispense fuel within 20 feet (6.1 meters) 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.

⚠ 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.

Awareness and adherence to fire safety procedures is an important part of being a responsible motorhome owner/operator. Make sure that everyone traveling in the motorhome is familiar with the location of exits, including emergency exit egress windows (if installed). By following these basic rules of fire prevention, the possibility of a fire can be significantly reduced:

- Never store flammable liquids within the motorhome
- Keep cooking surfaces clean
- Never use a flammable liquid or substance as a cleaning agent or solvent
- Never leave cooking food unattended
- Keep flammable materials away from open flames
- Never smoke in bed; and when smoking, always use an ashtray
- Never allow children to play with propane or electrical equipment
- Never use an open flame as a source of illumination
- Never overload electrical circuits
- Promptly repair faulty or damaged wiring and electrical components
- Locate and repair propane gas leaks immediately
- Do not allow rubbish to accumulate
- Spray fabrics annually with a flame retardant

Basic Rules of Fire Safety

1. Evacuate everyone (including pets) from the motorhome immediately!
2. After everyone is clear, check the fire to determine if it can be easily put out. **If the fire is too large, or the fire is fuel fed, stay clear of the motorhome and have the fire department manage the emergency.**
3. **If it can be safely done, without risking bodily harm or injury:**
    - Turn OFF the main propane gas valve at the propane tank.
    - Switch the 120 volts AC main circuit breaker to the OFF position.
    - Disconnect the shore line power cord from the shore power receptacle.
    - Turn OFF the generator (if equipped).
    - Disconnect the negative battery cable(s) at the auxiliary battery and chassis battery.
4. DO NOT attempt to use water to put out the fire. Water can spread some types of fire (grease or oil), and electrocution is possible with an electrical fire.
5. Always have faulty or damaged wiring, electrical components, propane tanks, valves, pipes, gas, and electrical appliances 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 extinguish:

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 near the side entrance door. It is suitable for extinguishing small fires of the Class B or C type.

Typical Class B-C fire extinguisher

Operation

For information on how to use your fire extinguisher, refer to the fire extinguisher manufacturer's instructions or the label affixed to the fire extinguisher.

Inspection

Inspect the extinguisher at least monthly (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 instructions, and/or expiration date listed on the label affixed to the fire extinguisher.

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

Smoke Alarm

⚠ WARNING

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

Typical RV smoke alarm

The smoke alarm installed in your motorhome is listed for use in recreation vehicles. It only performs as intended if it is maintained in proper operational condition. Smoke alarms have a limited life and over time, will cease to function. 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 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, distracting noises from electronics, appliances, loud outside noises, etc.

Operation

The smoke alarm is operational once the battery(ies) is/are correctly installed. It will not function if the battery is missing, disconnected, dead, the wrong type, or not installed correctly. Refer to the smoke alarm manufacturer's owner's manual for correct battery and installation information.

The LED light indicates the smoke alarm is functioning properly. When smoke or burning material(s) is sensed, the smoke alarm sounds a loud alarm that continues until the air is cleared of smoke. 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) is detected.

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 an undetected faulty smoke alarm, which could lead to death or serious injury.

To test the smoke alarm, stand at arm's length from the smoke alarm, as the alarm horn is loud and may be harmful to your hearing. Actuate the test button, which will activate the alarm. Pressing 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 instructions, and/or the expiration date listed on the device.

Carbon Monoxide (CO)

⚠ DANGER

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

⚠ 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 a poisonous gas that is colorless, orderless, and tasteless. Many cases of reported carbon monoxide poisoning indicate that, 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. Due to their physical size, young children and household pets may be the first to show symptoms of carbon monoxide poisoning.

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.

NOTE: Know the symptoms of carbon monoxide poisoning. If you or your passengers experience symptoms of carbon monoxide poisoning, seek immediate medical attention:

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

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 or operate 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 cause 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

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

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

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 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 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 provided when using gas cooking appliances to help avoid the dangers of asphyxiation.

Combination Carbon Monoxide/ Propane Alarm

⚠ WARNING

THE CO/LP COMBINATION DETECTOR OPERATES ON 12 VOLT HOUSE POWER; IT DOES NOT CONTAIN AN INTERNAL BACK-UP BATTERY. IT WILL BE DISABLED WHEN HOUSE BATTERIES ARE DISCONNECTED, OR SHORE POWER IS REMOVED, OR IF THE HOUSE BATTERY VOLTAGE DROPS BELOW THE OPERATING THRESHOLD VOLTAGE OF THE DETECTOR!

⚠ WARNING

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

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

Do not disconnect the combination carbon monoxide/ propane alarm from its power source.

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 provide its intended protection if it is maintained in operational condition.

Typical combination carbon monoxide/propane alarm

The combination carbon monoxide/propane alarm is wired directly to the motorhome's 12 volt DC electrical system, with continuous power being supplied by the auxiliary battery. There is not a built-in back-up battery 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 toxic carbon monoxide gas that results from incomplete combustion, such as emitted from appliances, furnaces, and auto exhaust, along with propane gas that may be present. A carbon monoxide/propane alarm is **NOT A SUBSTITUTE** for other combustible gas, fire or smoke detection alarms. Please note that there are hazards against which carbon monoxide detection may not be effective, such as detection of natural gas and other harmful substances.

Although this alarm is designed to sense the presence of carbon monoxide/propane gas, 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, 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 service life of the alarm.

What to do if the Alarm Sounds

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

If the alarm reactivates within a 24-hour period, repeat steps 1-4 and call a qualified appliance technician to investigate for sources of carbon monoxide and/or propane gas and inspect for proper operation of this equipment. Make sure that motorized vehicle(s) are not, and have not been operating adjacent to the motorhome and that the motorhome has not been operating in an enclosed space.

Have all identified problems corrected immediately. Note 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.

Failure to do so can result in an undetected faulty CO/ LP alarm, which could lead to death or serious injury.

The TEST switch is located on the front of the alarm. Pressing the switch should activate the alarm horn. If the alarm fails to sound, 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 service life and must be replaced following the alarm manufacturer's instructions and/or the expiration date listed on the device.

Exhaust Fumes and Gases

⚠ WARNING

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

If you are in a parked motorhome with either the engine running or the generator running there is a potential for exhaust fumes entering 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 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 draw outside air into the motorhome (set the blower on high speed).
- Ensure the motorhome's ventilation system and the carbon monoxide alarm are properly maintained. Keep the ventilation inlet grill(s) clear of snow, leaves or other obstructions at all times.
- Ensure the motorhome's engine exhaust and the generator's exhaust systems are properly maintained and functional. Repair any damaged exhaust system components immediately.

Fuel System Safety

⚠ DANGER

NO SMOKING

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

Do not dispense fuel within 20 feet (6.1 meters) 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.

⚠ WARNING

Flammable 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.

NOTICE

Depending upon model and chassis, TMC Class B Motorhomes may be equipped with either gasoline or diesel-fueled engines. Always be sure to fuel your motorhome with the correct petroleum products.

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 fuel vapor is present.

In cold weather conditions or when your motorhome has not been used for a while, a fuel additive (customer supplied) may be needed. Refer to the chassis manufacturer's recommendations for fuel additives.

Fuel Cap

If you should lose your fuel cap it should be replaced as soon as possible with a cap of the same size and type. Always remove the fuel cap slowly and pay close attention to the fuel recommendations outlined in the vehicle manufacturer's owner's manual.

Fuel Cut-Off Switch

If your motorhome is involved in a collision, an inertia switch in the fuel pump circuit may open, shutting down the flow of fuel to the engine. This is a safety feature designed to reduce fuel spillage as a result of an accident or collision. When this inertia switch has been activated, it is necessary to manually reset it before the motorhome can be restarted and moved.

Review the vehicle manufacturer's owner's manual for instructions regarding the fuel cut-off switch, what to do in case of an accident, and when it is safe to reset the switch.

Front Air Bags

⚠ WARNING

Your motorhome may be equipped with an air bag restraint system. Follow all air bag instructions provided by the chassis manufacturer including all warnings regarding the placement and safety of child and infant passengers.

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

If the vehicle is equipped with front passenger air-bags, ensure that the air bag system is appropriately set for the size and weight of the front passenger. Refer to the chassis manufacturer's owner's manual for front air bag operation.

Driver and Front Passenger Seats

⚠ WARNING

All swivel seats located in the cab of the vehicle (driver and front passenger) must be in the locked, upright and forward-facing position while the vehicle is in motion and seats are occupied.

Driver, front passenger and all occupants must always wear seat belts while the vehicle is in motion.

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

For comfort and convenience, your motorhome may be equipped with tilt and swivel seats in the cockpit area. These features are designed to **only be used when the motorhome is parked**. Before travel or moving the motorhome, ensure all front seat backs are returned to an up-right position and swiveled to their forward-facing position.

Some TMC motorhomes include tilt and swivel seating in the coach area. If these seats are equipped with seat belts and intended for passenger occupation while the vehicle is in motion, then these seats must also be returned to an up-right and swivel-locked position before travel.

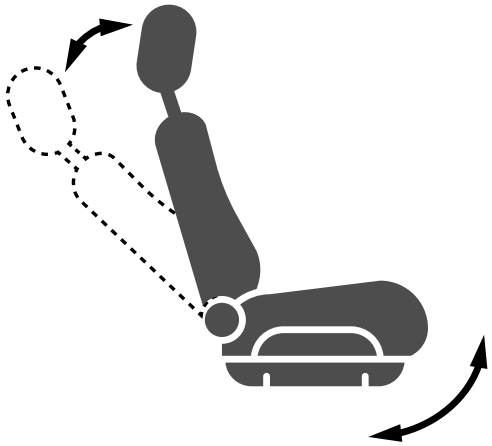


Illustration of driver and front passenger reclining and swivel seats

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.**
- **All swivel and/or reclining seats must be returned to their upright, forward-facing and locked position while the vehicle is in motion.**
- **Seat belts are designed for single occupancy. Do not use a seat belt for more than one person at a time.**
- **The sleeping accommodations in this vehicle are designed for occupancy only while vehicle is NOT in motion. Do not occupy beds or any other seats that are not equipped with seat belts while the motorhome is in motion.**
- **Seat belts installed in areas that convert to beds or bunks may fall between cushions or framework. Be sure beds are in their upright seating position and all seat belts are properly and securely placed and available for use before travel.**

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

Typical passenger seat belts located in a dinette or sofa seating area

All occupants must be furnished with and use seat belts while the motorhome is in motion. 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.

Never allow passengers to lie down while the motorhome is in motion. They would not be properly restrained in the event of a traffic accident or sudden vehicular movement, such as swerving to avoid a road hazard.

Operation

Driver and front passenger 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.

USING SEAT BELTS

- Insert the belt tongue into the proper buckle (usually the buckle closest to the belt tongue) 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 and tension; 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.

If seat belt replacement is necessary, ensure mounting and fastening devices are torqued to manufacturer's specifications.

Inspect the seat belts in your motorhome periodically to ensure they work properly and are not damaged. Make sure there are no nicks, tears, or cuts in the belt material. 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 installed in vehicles involved in a collision be replaced.

Child Passenger Safety

⚠ DANGER

Never allow a passenger to 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.

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

⚠ WARNING

- **Improper installation or failure to properly secure a child restraint can lead to failure of the restraint. The child could be severely injured or killed.**
- **Follow the child restraint manufacturer's directions exactly when installing an infant or child restraint.**

⚠ WARNING

- **Never place a rear-facing child restraint in front of an air bag. A deploying passenger front air bag can cause death or serious injury to a child 12 years or younger, including a child in a rear-facing child restraint.**
- **Never install a child safety restraint in the front seat of a vehicle. Only use child safety restraints in the rear seats. If the vehicle does not have a rear seat that includes a safety restraint belt or anchor that enables securing a child safety seat, do not transport children requiring child safety restraints in that vehicle.**
- **To ensure proper safety belt fit, always use booster seats for children who are size and age appropriate. Check the vehicle's ~~chassis~~ manufacturer's safety information or governmental safety regulations for child sizing charts.**
- **Always follow the vehicle manufacturer's safety instructions, along with state and federal regulations regarding transporting children and small adults.**

Always follow the instructions and warnings that are included with any infant or child safety restraint system:

- 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 safe transport of children in your motorhome.

For additional information, refer to:
http://www.nhtsa.gov/parents-and-caregivers

or call 1-888-327-4236.

In Canada, refer to Transport Canada's website:

https://tc.canada.ca/en/road-transportation/child-car-seat-safety

Transporting Pets

Air bags deploying in the front seat could harm your pet. An unrestrained pet will be thrown about an possibly injured, or injure a passenger during panic braking or in a collision.

Pets should be restrained in the rear seat (if equipped) in pet harnesses or pet carriers that are secured by seat belts.

Laws of the Road

It is advisable to contact the Department of Motor Vehicles in each state or country in which you travel, for up-to-date information regarding operation and licensing requirements for your motorhome and its drivers/operators.

Safely Driving the Motorhome

- Always operate the motorhome at a safe speed, which in some conditions may be less than the posted speed limit.
- All passengers must wear safety belts.
  a. Passengers can dramatically reduce their risk of being killed or seriously injured in a crash by wearing their safety belts.
  b. Drivers should be responsible for ensuring all passengers are properly using safety belts.
  c. Never transport more passengers that there are available safety belts installed in the motorhome.
  d. Ensure infants and children are properly secured in age-and-weight-appropriate safety restraints.
  e. Secure pets in harnesses or other appropriate safety restraints.
- Drivers must be well-rested, alert and maintain a safe speed for weather and road conditions.
- Drivers should keep their eyes on the road and hands on the steering wheel.
- Drivers should not allow themselves to become distracted while operating the motorhome. If something other than operating the vehicle requires driver attention, safely pull off to the side of the road and attend to the situation.
- Drivers must be especially cautious on curved roads and maintain a safe speed to avoid running off the road or losing control of the motorhome.
- If the vehicle's wheels proceed off of the roadway, gradually reduce speed and steer back onto the roadway when it is safe to do so. Avoid abrupt maneuvers to return the vehicle to the roadway.
- Your vehicle may be equipped with advanced driver assist technologies. Remember that even advanced technology cannot overcome the laws of physics. It's always possible to lose control of a vehicle due to inappropriate driver input for the conditions.
- In the event of a flat tire or tread separation, gradually slow down the vehicle, steer to the side of the road while avoiding abrupt maneuvers.
- In that motorhomes are substantially longer, wider, taller, and heavier than cars, they;
  a. require more space and additional reliance on the side-view mirrors for changing lanes, turning corners, and making parking maneuvers;
  b. require additional braking time and distance;
  c. do not respond as quickly to abrupt steering inputs;
  d. are affected by strong winds, which in some conditions, can make driving the motorhome difficult;
  e. have a higher center-of-gravity, which affects the vehicle's handling characteristics.
- Ensure all drivers and co-drivers are practiced with the unique driving and handling characteristics of the motorhome.
- Backing the vehicle can present unique challenges and hazards. Use mirrors, back-up cameras and when necessary, a spotter (person outside the motorhome giving directions to the driver) to ensure safe vehicle movement.
- Do not exceed the vehicle weight limits or axle weight limits specified on the Federal Weight Label (Section 5). Exceeding any vehicle weight rating could result in serious damage to the vehicle, loss of vehicle control, and increases the risk of vehicle rollover and personal injury.
- Towing trailers beyond the maximum recommended gross towing capacity of this vehicle and its towing hitch could result in a loss of vehicle control, vehicle rollover, and personal injury. Refer to Section 5 of this manual and

the chassis manufacturer's owner's manual for important towing information.

- 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.

Emergency Stopping

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

1. Pull off the road as far as possible.
2. Put the motorhome's transmission 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 warning indicator on the traffic side of the motorhome, directed toward traffic approaching the rear of the motorhome, approximately 10 feet from the rear bumper.
   b. Place the second warning indicator 100 feet behind the motorhome, in the center of the lane or shoulder occupied by the motorhome, and directed toward traffic approaching the rear of the motorhome.
   c. Place the third warning indicator 100 feet in front of the motorhome, in the center of the lane or shoulder occupied by the motorhome, and directed towards the traffic approaching the front of the motorhome.
   d. If stopped within 500 feet of a curve, crest of a hill, or other obstruction to view, place a warning indicator in the direction of the obstruction (front and/or back of the motorhome), at a distance of 100 feet to 500 feet from the stopped motorhome so as to afford ample warning to traffic approaching the motorhome.
5. Always stand off the road, out and away from of the lanes of traffic.

NOTE: Curves and/or hills may affect the safe placement of warning indicators, such as safety reflectors, cones, flares, etc. Extinguish flares before leaving the emergency parking site.

Along with other emergency equipment (reflectors, first-aid kit, etc.), it is good safety practice to carry a reflective safety vest and wear it anytime you are stopped or parked along a road or highway.

Reference: Emergency signals, stopped commercial motor vehicles; Code of Federal Regulations: Title 49, Subtitle B, Chapter III, Subchapter B, Part 392, Subpart C, §392.22.

Clearance and Side Marker Lights

For vehicle safety and visibility on the highway, clearance and side marker lights are installed on your motorhome. The location and color of marker lights are regulated by Federal law and must comply with all applicable requirements prescribed for it by FMVSS/CMVSS 108. Please maintain your motorhome's clearance and side marker lights as described in this reference:

https://one.nhtsa.gov/cars/rules/standards/conspicuity/TBMpstr.html

Mirrors and Vision Systems

Typical Rear View Camera

For safe driving and vehicle maneuvering, both on and off the highway, it is imperative that the motorhome driver/operator becomes proficient with using mirrors and vision systems. Vision aids for motorhomes vary, due in part to the variety of motorhome classes and sizes. Optional equipment and driver preferences are also factors that determine the type of vision aids equipped on motorhomes.

Mirrors

The mirrors on your motorhome should always be kept in adjustment and good working order. Always check mirror adjustment before moving the motorhome to ensure an unobstructed rearward view.

Vision Systems

Your TMC motorhome may be equipped with a rear and/or side vision system. If equipped, the installation includes a rearview camera mounted along the top of the motorhome's rear valance and an in-dash camera monitor, usually integrated with the dash radio screen or interior rearview mirror. Some installations may also include side-view cameras. Camera signals are fed to the dash radio/camera monitor and appear when the gear selector is placed in reverse, or with side-view cameras, actuated by the turn signals.

NOTE: In most motorhome installations, the dash radio is powered by the auxiliary (coach) battery(ies). When the back-up camera monitor is integrated into the dash radio display, the Main Battery Switch must be ON in order to activate the back-up camera system.

TO OPERATE

1. For the camera monitor to function, the dash radio must be ON. It is powered by the auxiliary battery(ies), therefore, the master battery switch must also be ON. It is normal to keep the master battery switch in the ON position while traveling. Doing so also allows the vehicle's charging system to charge the auxiliary battery(ies) while the engine is running.
2. When the gear selector is placed in REVERSE, the radio display automatically changes to the rear-view camera monitor, allowing for a rearward view via the camera and monitor system.
3. When the gear selector is moved out of REVERSE, the camera will automatically turn off and the radio display will revert to the previous screen.

Chemical Sensitivity

⚠ 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

When your new motorhome, and for some time afterward, has been closed up for an extended time period, you may notice a strong odor associated with chemical off-gassing (or out-gassing). This is not a defect in your motorhome. There are many materials and products used in the construction of recreational vehicles, such as carpet, linoleum, plywood, insulation, paint, and upholstery, that when new or when exposed to elevated temperatures and/or humidity, may off-gas chemicals, including formaldehyde. Off-gassing, may cause irritation of the eyes, nose, and throat and sometimes headache, nausea, and a variety of asthma-like symptoms. Elderly people 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.

NOTE: Chemical off-gassing is not a defect in your motorhome and is not covered by Thor Motor Coach's Limited Warranties.

Ventilation

To reduce exposure to chemicals from off-gassing, it is of utmost importance that you ventilate your motorhome. Chemical off-gassing is accelerated by heat and humidity, therefore, ventilation should occur frequently after purchase and at times when the temperatures and humidity are elevated. Keeping the motorhome tightly closed has the potential of increasing the formaldehyde level of the interior air. Ventilate the motorhome by opening windows, exhaust vents, and doors. Operating ceiling fans and vents, air conditioners, and the furnace will help dry the air. Also follow the recommendations regarding how to avoid condensation problems contained in Section 11. Many of the recommendations listed there will assist in avoiding exposure to off-gassed chemicals.

Smoking and Medical Advice

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

If you have any questions regarding chemical sensitivity, consult with your physician or local health services provider.

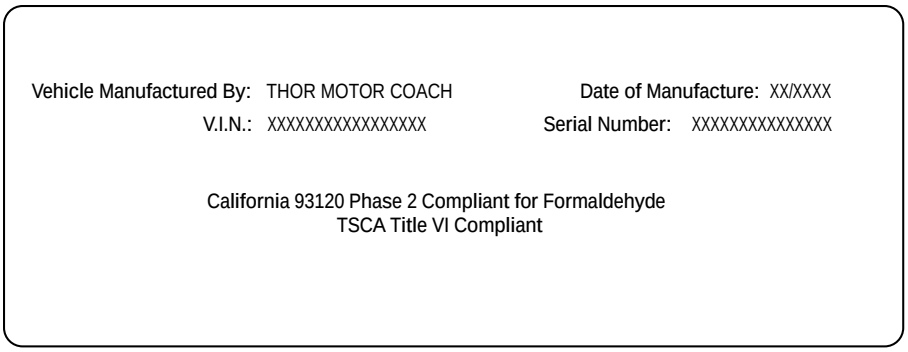
Formaldehyde

Most of the concern regarding chemical off-gassing pertains to the chemical, formaldehyde. Formaldehyde is a naturally occurring substance and is also a key industrial chemical used in the manufacture of the numerous materials and products 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 items. Some people are very sensitive to formaldehyde, while others may not have a reaction to the same level of chemical exposure. For the materials used in the construction of your motorhome, the amount of off-gassed formaldehyde decreases over time.

CALIFORNIA 93120 PHASE 2 FORMALDEHYDE COMPLIANCE

Your motorhome may be compliant to California Formaldehyde Phase 2 Codes. If so, it will be labeled with a compliance identification tag similar to this illustration. If you have questions or concerns regarding formaldehyde and your motorhome, please contact Thor Motor Coach Customer Care:

877-855-2867.



Typical California Formaldehyde Compliance label

Mold Prevention

Molds are microscopic organisms that naturally occur in virtually every environment, both 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 issues. Some people are sensitive to molds. For these people, molds can cause nasal stuffiness, throat irritation, coughing or wheezing, eye irritation, or skin irritation. People with mold allergies may have more severe reactions. Immune-compromised people and those with chronic lung illnesses may develop serious infections in their lungs when they are exposed to molds.

For mold growth to occur, temperatures must be between 40º and 100º Fahrenheit (4.4º to 37.7º Celsius) and there must also be a source of moisture, such as humidity in the air, standing water, damp materials, etc. Indoors, the most rapid mold growth occurs when warm and humid conditions exist.

Inhibiting Mold Growth

The growth of mold and mildew can be inhibited by controlling relative humidity. In warm climates, use of the air conditioner will reduce the relative humidity. Opening vents that are located in the bathing and cooking areas is advised during food preparation and bathing, even during cool or cold weather. Additionally, opening a window during these activities will assist in ventilation. In extremely humid conditions, the use of a dehumidifier (customer supplied) can be helpful in reducing air-borne moisture.

Frequent cleaning of your motorhome is an important preventive measure. Spills should be wiped up quickly and dried as soon as possible. Avoid leaving damp items lying about. On surfaces, use mold or mildew killing cleaning products (test cleaning product to ensure it will not damage surfaces). Check window, door, and joint seals regularly and repair or reseal when necessary to avoid water intrusion. Proper regular and preventive maintenance to the motorhome and its accessories will help prevent the formation of molds.

NOTE: For more information about controlling moisture in your motorhome, refer to Condensation, located in the Care and Maintenance section of this manual.

Tires and Wheels

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

Check tire pressure at the beginning of each trip and frequently throughout the trip to obtain the maximum performance and life from the tires. Follow the instructions listed on the Federal Certification label, located inside your motorhome, to determine the correct tire pressures for your vehicle.

Read and follow the safety instructions listed below before traveling in your motorhome:

- Proper care and maintenance of your motorhome's tires is essential to the safe operation of your motorhome.
- You must follow the tire inflation guidelines, listed on the Federal Weight Label, for correct tire inflation and maximum load capacity (see Section 5).
- Under-inflation of tires is just as dangerous as over-inflation.
- To insure your motorhome tires are operating at their peak performance and safety, regular inspection of tires and checking tire pressures is absolutely mandatory.
- Examine your motorhome tires frequently for unusual wear. Wheel alignment, tire balance and bearing wear will affect tire wear. Inspect tires for cracking, bulging, uneven tread wear, etc.

When traveling in your motorhome, check the inflation pressure of each tire at least weekly to insure maximum tire performance, 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.

Tire Inflation

Your tires and wheels support the entire weight of your motorhome and its contents. The tires are also the only contact your motorhome has with the road surface. Maintaining proper tire inflation is the most important factor in maximizing the performance and safety 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 de-lamination and/or loss of control of your motorhome. Avoid premature tire damage by keeping tires properly inflated.

Tire pressure under and/or over inflation can cause serious tire failure

FIND YOUR PSI

PSI (pounds force per square inch) is a measure of air pressure used to correctly inflate your tires. The correct PSI listing for your tires is located on your motorhome's Federal Weight Label (see Section 5). KPa (kilopascals) is another commonly used air pressure measurement (1 PSI=6.894 kPa).

CHECK IT MONTHLY

At least once a month, check all tire pressures (including the spare tire) using an accurate tire pressure gauge. You cannot determine if your tires are over-inflated or under-inflated by visual inspection only.

Your vehicle may include a Tire Pressure Monitoring System (TPMS), but this is NOT a substitute for manually checking tire pressure. See the chassis manufacturer's owner's manual for additional information.

NOTE: Check and adjust tire pressure when tires are cold. You cannot determine over or under tire inflation by visual inspection alone. Check pressures with an accurate tire pressure gauge.

Common Tire Wear Patterns

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

NOTE: The use of tire traction devices (studded tires or snow chains) may either be prohibited or required in certain travel regions and/or weather conditions. Always check with the state's Department of Transportation for vehicle operating regulations and guidelines.

Lug Nut Torque

⚠ CAUTION

As part of your pre-travel check-list, always check lug nut torque with a properly calibrated torque wrench. Torque lug nuts to the vehicle manufacturer's specifications.

Always properly torque lug nuts as part of a tire changing procedure.

Ensuring wheel mounting nuts (lug nuts) on the wheels are tight and properly torqued is an vitally important responsibility for safe motorhome travel. Inadequate and/or inappropriate wheel nut torque (tightness) is a major reason that lug nuts loosen or fail 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.

Wheel 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.

It is very important to maintain proper wheel alignment for your motorhome. Improper wheel alignment not only contributes to premature tire wear, but severely affects vehicle handling. Toe-in and toe-out (only) are inspected by TMC prior to shipment to your selling dealer.

Tire Replacement

⚠ WARNING

Failure to replace damaged tires with tires of the same size, type, traction, and load rating than the originally equipped tires can significantly affect the weight carrying capacity, handling, and safety of your motorhome.

⚠ WARNING

Ensure the spare tire is the same size and specifications listed on your motorhomes Federal Weight Label.

Tires degrade over time depending on many factors such as weather, storage conditions, and conditions of use (load, speed, inflation pressure, etc.) experienced throughout the life of the tires. In general, tires should be replaced after six years regardless of tread wear. Heat caused by hot climates or frequent high-loading conditions, however, can accelerate the aging process and may require you to replace the tires more frequently.

You should also replace your spare tire when you replace the road tires or after six years due to aging, even if has never been used.

Replacement tires should be exchanged with the same size, type, load rating, traction, and temperature rating of the original equipped tires. Tire specifications are listed on the motorhome's Federal Weight Label or found within the chassis manufacturer's owner's manual.

NOTE: Installing replacement tires with a higher limit than that of the originals DOES NOT increase the payload capacity of the motorhome. Refer to the chassis manufacturer's owner's manual for additional information.

Changing a Damaged Tire

⚠ CAUTION

Always follow the vehicle manufacturer's instructions and procedures for jacking and securing the motorhome when tire changing is necessary.

If you experience a flat tire while driving your motorhome:

- Gradually decrease your vehicle speed; braking lightly if possible.
- Hold the steering wheel firmly, direct the motorhome to a safe place along the side of the road.
- Once safely parked, place warning markers as described in Section 3, Emergency Stopping.
- If you need assistance, contact a road service provider, a qualified RV or tire service repair center, or if an emergency, call 911 (in the U.S.) for assistance.
- Make sure the road service technician reads and is familiar with the tire changing information provided by the chassis manufacturer. Make sure the wheel nuts have been tightened to the proper torque as outlined in the chassis manufacturer's owner's manual.

NOTE: There are factory-installed components attached to the undercarriage of your motorhome. Be sure jacks and jacking devices do not contact and damage undercarriage components.

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 on the next page describes important tire information that is embossed on every tire by the manufacturer.

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

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.

TRACTION: The traction rating indicates the tire's stopping ability on wet pavement.

Illustration courtesy of NHTSA, www.safercar.gov

ASPECT RATIO: This two-digit number gives the tire's ratio of height and width.

R: The "R" stands for radial. Radial tires have been the industry standard for more than 20 years.

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

LOAD INDEX: This two-digit or three-digit number indicates how much weight each tire can support.

SPEED RATING: The speed rating indicates the maximum speed capability of the tire. This rating includes speeds from 99 MPH to above 186 MPH.

M+S: This indicates 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 manufacturer's plant location. The last four numbers represent the week and year the tire was made.

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

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).

Introduction

Proper loading of the vehicle is one of the most important considerations when traveling in a motorhome. Your motorhome is designed to carry a certain safe maximum load. This is the Gross Vehicle Weight Rating, or GVWR. When towing a trailer or vehicle, the added weight calculates towards the total weight of your motorhome (Gross Combined Weight, or GCW). Staying within the weight limits of your motorhome will help to ensure your motorhome performs and operates safely for your journeys.

Both the chassis manufacturer and Thor Motor Coach provide weight ratings and recommendations for loading your motorhome. Read and follow the information provided by the chassis manufacturer in the chassis manufacturer's owner's manual as well as information provided by Thor Motor Coach in this owner's manual. Important weight ratings are listed on labels affixed to your motorhome. Do not remove these important safety labels. For safe operation, **NEVER OVERLOAD YOUR MOTORHOME OR TOW A TRAILER OR VEHICLE THAT IS BEYOND THE SAFE TOWING WEIGHT RESTRICTIONS OF YOUR TOWING HITCH AND MOTORHOME.**

Important Weight Terminology

Listed on the following pages are several important terms that you need to become familiar with in order to safely load and use your motorhome as a towing vehicle. Please consult your chassis (van) owner's manual for additional information provided by the chassis manufacturer.

CURB WEIGHT:

The weight of an unloaded motorhome plus the weight of a full tank of fuel. Does not include propane, water, passengers, cargo, or aftermarket add-ons.

UNLOADED VEHICLE WEIGHT (UVW):

The curb weight of the unloaded motorhome plus a full propane tank.

CARGO WEIGHT:

The total weight of all cargo added to your motorhome, including food, clothing, camping gear, pots and pans, tools, water (fresh and waste), propane, and all aftermarket equipment added to the motorhome. Also includes trailer tongue weight. Keep in mind, carrying unnecessary water quantities (fresh or waste) adds significantly to the total cargo weight:

1 gallon of water = 8.3 pounds

1 gallon of propane = 4.2 pounds

1 gallon of gasoline = 6 pounds

1 gallon of diesel fuel = 7 pounds

OCCUPANT AND CARGO CARRYING CAPACITY (OCCC):

The maximum weight of all cargo and occupants that can be safely carried by the motorhome. The tongue weight of your towed trailer or vehicle must be included in the total cargo weight. **DO NOT EXCEED THE OCCC RATING OF YOUR MOTORHOME.**

OCCC is determined by subtracting the UVW of the motorhome from the GVWR of the chassis, plus the weight of any carried LP fuel. The OCCC of your motorhome is listed on the yellow OCCC label, affixed to the forward, right-side entry or passenger door.

GROSS VEHICLE WEIGHT RATING (GVWR):

The maximum permissible weight of a fully-loaded motorhome. GVWR is determined by the chassis manufacturer and takes into consideration the design of the frame, suspension components, axles, and tires. This rating can be found on the Incomplete Vehicle Identification Data Label affixed to the driver's door jamb.

GROSS VEHICLE WEIGHT (GVW):

The actual measured weight of your loaded vehicle. Gross Vehicle Weight = Curb Weight + Total Cargo Weight + Total Passenger Weight). **THE MEASURED GVW MUST NEVER EXCEED THE GVWR OF THE MOTORHOME.**

GROSS COMBINED WEIGHT RATING (GCWR):

The maximum allowable loaded weight of this recreational vehicle, including the weight of its towed trailer or towed vehicle. This rating is determined by the chassis manufacturer and takes into consideration the design of the chassis, suspension components, tires, engine torque and horsepower, and drivetrain components.

GROSS COMBINED WEIGHT (GCW):

The actual measured combined weight of your loaded motorhome plus the weight of your loaded trailer or towed

vehicle. This weight measurement is found by weighing the motorhome with its towed vehicle on a commercial vehicle scale. **THE MEASURED GCW MUST NEVER EXCEED THE GCWR OF THE MOTORHOME.**

NOTE: The motorhome's braking system is rated for operation at the GVWR, not the GCWR. A supplementary braking system should be used for safe control of towed vehicles and for trailers weighing more than 1,500 pounds when loaded. Supplemental braking systems are required by transportation laws.

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. This rating is determined by the manufacturer of the chassis. This rating can be found on the Federal Weight Label, affixed to the driver's door jamb (Class C and B) or near the driver's seat (Class A).

GROSS AXLE WEIGHT (GAW):

Gross axle weight is the total weight of the fully loaded motorhome on each axle. This weight figure is determined by actually weighing the fully loaded motorhome with a loaded trailer or towed vehicle. See your owner's manual for instructions on weighing your motorhome.

TONGUE WEIGHT:

Weight directly transferred to the hitch of the motorhome by a loaded trailer. The maximum tongue weight is listed on the motorhome's hitch label. Be sure that tongue weight never exceeds the GAWR of the rear axle of the motorhome. **DO NOT EXCEED THE TONGUE WEIGHT RATING OF THE HITCH.**

When loading a trailer, remember to place heavy cargo over the axle(s) of the trailer, however the trailer must have some tongue weight to help stabilize the trailer while being towed.

MAXIMUM LOADED TRAILER WEIGHT:

The highest possible weight of a fully loaded trailer or towed vehicle the motorhome can tow based on a minimally loaded motorhome (GVW).

TOWING CAPACITY:

Towing capacity is determined by subtracting the measured Gross Vehicle Weight (GVW) from the Gross Combined Weight Rating (GCWR). **DO NOT EXCEED THE TOWING CAPACITY RATING OF THE HITCH.**

Federal Weight Label

The Federal Weight Label is typically affixed to the driver's doorjamb for Class B and C motorhomes. This label concisely states the gross vehicle weight rating (GVWR) of your motorhome, along with the gross axle weight rating (GAWR) (both front and rear), tire size, tire weight rating, and proper tire inflation. This information meets the requirements of 49 CFR part 571.120 as issued by the National Highway Traffic Safety Administration (NHTSA).

MANUFACTURED BY: THOR MOTOR COACH, INC.
GVWR: XXXX KG (XXXXX LB)
INC. VEH. MFG. BY: <Insert Chassis Manufacturer>

OFFLINE: MM/YY
SERIAL: XXXXXXXXXXXXX
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)	☐	☐
REAR:	XXXX (XXXX)	LT215/85R16	5.5 J X 16	XXX KPA(XX PSI)	☐	☐
TAG:					☐	☐

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT IN MM/DD/YYYY

V.I.N.:XXXXXXXXXXXXXXXXX

TYPE: MULTIPURPOSE PASSENGER VEHICLE

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

Occupant and Cargo Carrying Capacity Weight Label

The Motorhome Occupant and Cargo Carrying Capacity weight label is affixed to the interior side of the forward-most passenger door of Class B and C motorhomes. This label indicates how much passenger and cargo weight you can safely carry within the motorhome. The total weight of passengers, cargo, water (fresh and waste), and trailer tongue weight should never exceed the weight values shown on this label.

This label also includes important safety belt seating capacity information and the measured overall length of the motorhome.

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 of the motorhome and towed vehicle does not exceed the gross combined weight rating (GCWR) of the motorhome. Contact your dealer or the chassis manufacturer for GCWR ratings.

MOTOR HOME OCCUPANT AND CARGO CARRYING CAPACITY
VIN# XXXXXXXXXXXXXXXXX
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 #: XXXXXXXXXXXXX)
Recreational vehicle overall length XX' XX" (X.XXXm) as manufactured

Typical Motorhome Occupant and Cargo Carrying Capacity Label

5

Weighing Your Motorhome

When loading your cargo, be sure weight 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 possible. Too many items stored on one side of your motorhome may overload tires and cause handling issues.

Periodically weigh your motorhome at a public vehicle scale to determine axle loads. 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.

To weigh your motorhome correctly, measure the fully loaded vehicle axle by axle and wheel position by wheel position. Allow adequate time, since the entire weighing process can take around 30 minutes. There may be a small fee for each weight reading taken, but the expense is a worthwhile investment toward the safe operation of your motorhome.

Your motorhome must be weighed fully loaded, which includes passengers, food, clothing, fuel, water, propane, supplies, etc. Any towed vehicle (boat, or trailer) or items loaded on brackets on the back or roof of the motorhome should also be included in the weighing process.

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.
5. 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.

Reading A: Front

Reading B: Total Coach

Reading C: Back

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

OTHER FACTORS TO CONSIDER:

- Your motorhome must remain as level as possible on the scale, even though an axle or side 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 and whenever possible, use a segmented 4-pad scale 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, redistribute or remove a portion of the cargo until the weight is within the proper limits for all four corners of the vehicle.
- Periodically check and adjust your motorhome's cargo weight to obtain optimum mileage from your tires and to optimize vehicle handling. Tires should always be inflated as recommended on the Federal Weight Label affixed to your motorhome.

Weight Distribution

An overloaded motorhome is hard to drive and hard to stop. In cases of serious overloading, brakes can fail completely, particularly on steep hills. Proper weight distribution also affects tire performance. The load a tire will safely carry is a combination of its size, its construction, its load range, and corresponding inflation pressure.

Improper weight distribution, or too much weight on your motorhome's suspension system, can cause failure or damage to:

- Springs and suspension components
- Shock absorbers
- Brakes
- Tires
- Steering components

NOTE: At approximately 8 pounds per gallon, water can add a considerable amount of weight to your motorhome. Additional cargo carrying capacity for other items can be obtained by reducing the amount of fresh and waste water carried while traveling.

However, it is recommended to always keep a few gallons of water in the black tank to help prevent the build-up of sludge, which can lead to waste water system blockages.

Loading Your Motorhome

Always consider proper vehicle loading when preparing for travel. By not overloading the motorhome and keeping the weight balanced side-to-side and as close to the axles as possible, the drivability and safe handling of the vehicle will be maximized.

- Never overload your motorhome. Always observe and stay under the GVWR and OCCC ratings.
- Distribute cargo side-to-side so the weight on each tire does not exceed one-half of the GAWR for either axle.
- Store and secure all loose items inside the motorhome before traveling. Overlooked items such as canned goods, small appliances on the countertop, cooking pans on the range, or free-standing furniture items can become dangerous projectiles during a sudden stop.
- When traveling, keep the quantity of fresh, gray, and black water within the storage tanks to a minimum. This reduces the total weight of the motorhome, therefore increasing available carrying weight for other items (refer to Occupant Cargo Carrying Capacity (OCCC) of the motorhome).

- Give careful attention to where and what type of flammable materials you store and transport. Certain storage areas are clearly labeled **DO NOT STORE COMBUSTIBLE MATERIALS.** Be sure all canisters are secure and leak free. **DO NOT TRANSPORT LP TANKS OR CANISTERS INSIDE THE VEHICLE** (see Propane Section).
- For traveling safety, it is important to make sure tie down straps on appliances, furniture, and cargo (inside the vehicle) and cargo (outside the vehicle) are secured and remain tight. Check straps regularly to ensure they have not loosened during travel.
- Be sure not to overload roof racks with cargo that is heavier than the load-carrying capacity of the roof rack system.
- If you are towing a trailer or vehicle, be sure to stay under the towing capacity of your motorhome and that the added weight stays under the GCWR for your motorhome.

Towing With Your Motorhome

⚠ WARNING

A SEPARATE FUNCTIONING BRAKE SYSTEM IS REQUIRED FOR ANY TOWED VEHICLES OR TRAILERS WEIGHING MORE THAN 1500 LBS WHEN FULLY LOADED. NEVER EXCEED THE GVWR, OR THE GAWR SPECIFIED ON THE MOTORHOME'S CERTIFICATION LABEL.

- **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.**
- **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 can also adequately stop the combined weight of the motorhome and towed vehicle.**

⚠ 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, 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 the vehicle manufacturer's 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

THE FULLY LOADED MOTORHOME AND THE TRAILER, OR TOWED VEHICLE, MUST NOT EXCEED THE MOTORHOME'S GROSS COMBINED WEIGHT RATING (GCWR).

- **Do not exceed the motorhome gross combined weight rating (GCWR), the hitch rating (in pounds), or the maximum tongue weight rating of the hitch (note: tongue weight is the weight in pounds pushing down on the hitch).**
- **Consult with your selling dealer to determine the GCWR of the motorhome and the towing capacity of the motorhome.**

NOTICE

For safe towing a trailer or vehicle with your motorhome, always stay within the limits of your motorhome's GVWR, GCWR, GAWR and weight ratings of the hitch.

NOTICE

TMC Motorhomes are factory equipped with a towing hitch and wiring harness. However, TMC motorhomes are not factory equipped with supplemental trailer braking systems. Always have trailer braking systems professionally installed and routinely inspected by a qualified technician.

If you are unsure of any aspect of safe towing, seek professional advice from a reputable hitch installer, trailer, or RV dealer.

NOTES:

- Thor Motor Coach accepts no responsibility for damage to the chassis and other components resulting from towing with this vehicle.
- Consult with your dealer or the chassis manufacture regarding the suitability and/or safe use of weight-distributing hitches with this vehicle.

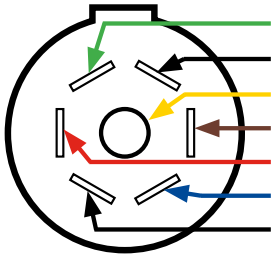
4-WAY CONNECTOR WIRING *(VEHICLE SIDE)*

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

Electrical Connections for Towing

A 4-way or 7-way trailer plug, supplied by the chassis manufacturer, is pre-wired 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 the vehicle manufacturer's owner's manual for additional information regarding vehicle towing.

7-WAY CONNECTOR WIRING *(VEHICLE SIDE)*

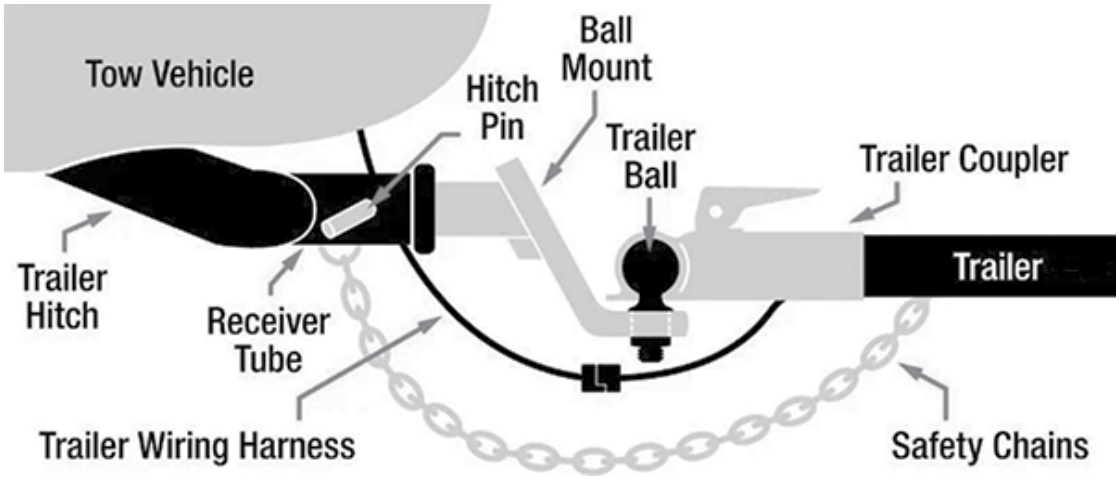


Signal	Wire Color
Tail & Running Lights	Green
12V Power	Black
Reverse Lights	Yellow
Right Turn & Stop	Brown
Left Turn & Stop	Red
Brake Controller Output	Blue
Ground	White

Towing Hitch

Your motorhome is equipped with a **3,500** pound rated, Class III towing hitch receiver and trailer wiring receptacle. Please refer to the chassis manufacturer's owner's manual for towing recommendations and towing limitations for this vehicle.

If you are considering towing a trailer behind your motorhome, consult with your dealer or qualified towing expert about available towing equipment and towing options appropriate for your motorhome and travel needs.



Typical towing components

Safe Towing Tips

- Never exceed the hitch tow rating, the hitch tongue weight rating and the towing capacity of your motorhome. Exceeding the maximum towing capacity can result in dangerous handling, insufficient braking performance, or serious damage to the vehicle's suspension, engine and drive train.
- Make sure your trailer hitch is capable of handling your trailer's loaded weight.
- When loading and towing with your vehicle, do not exceed the GVWR and GCWR of your motorhome.
- There are several sizes of trailer balls available. **BE SURE THE TRAILER BALL MATCHES THE SIZE OF THE TRAILER COUPLER!**
- Always ensure the trailer coupler is properly seated and locked onto the trailer ball (see illustration).
- Always ensure the hitch pin is properly installed, securing the ball mount to the receiver tube (see illustration).
- 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 (see illustration).
- Always check brake lights, running lights, emergency flashers, and turn signals of the motorhome and trailer (or towed vehicle) at the start of the trip and often during the trip.

  Accidents can occur if the tail lights are not working or are improperly connected. Have a partner stand behind the vehicle, **while it is in PARK,** to check that the turn signals, tail lights and brake lights are functioning properly.
- Always pack your trailer so that most of the weight is over the axles, yet allowing sufficient tongue weight for safe control of the trailer.

  Not only do you want roughly 60% of the trailer's load placed over the front half of the trailer, you also should load it in a way that results in a tongue weight that is between 10-15% of the total weight of the loaded trailer. Ensure weight is evenly distributed on the left and right sides of the trailer. Once the load is properly distributed and an ideal tongue weight is achieved, all cargo should be secured to prevent the load from shifting.
- Check both **TRAILER AND MOTORHOME** tires daily for proper inflation and for any unusual wear (check tire pressure with cold tires). Don't forget the inner tires of the dual tire/wheel set-up and spare tires for both the motorhome and trailer.

  Tires that are not properly inflated can negatively affect handling. Further, under-inflated tires can create more rolling resistance, which not only forces the engine to work harder and consume more fuel, but also increases tire temperatures and may contribute to a blow-out. Additionally, check the speed and load rating on the tires for both your motorhome and trailer, and ensure you never exceed that these limits.
- Check your trailer's hub bearings before starting your trip, and often during your travels. Ensure bearings are in good order and properly greased.
- Check trailer brakes at the start of each trip and daily. Smaller, lighter trailers may not need trailer brakes of any kind, but heavier trailers, or those designed to carry heavier loads, will usually incorporate a trailer brake system. If your trailer is equipped with hydraulic or electric surge brakes, make sure the emergency "breakaway" cable is properly attached to your tow vehicle. In case your trailer somehow disconnects from the hitch, this cable is designed to trigger the brakes on the trailer and quickly bring it to a halt.
- Adjust your mirrors. Before taking off, make sure your side view mirrors are adjusted to create a clear view that extends to the end of the trailer.
- Ensure your back-up cameras are in proper working order. Some cameras may be able to be placed in monitor mode, so that the towed vehicle can be observed while traveling.
- 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 back-up maneuvers with a tow bar or tow dolly; doing so could result in damage to the motorhome, towed vehicle or towing device.
- Be mindful of the extra length a trailer or towed vehicle adds to your motorhome. Your motorhome is a long vehicle, and with the added length of a trailer, it can be very long. Be extra careful when merging into traffic or making lane changes. Allow extra time to make these maneuvers. **ALWAYS SIGNAL YOUR INTENTIONS WITH PROPER USE OF TURN SIGNALS.**
- Allow for extra braking distance caused by the added weight of a trailer or towed vehicle.
- Be extra cautious when making turns. Allow for the extra length and large turning radius caused by the added length of the trailer or towed vehicle.
- Use the aid of a spotter when backing the trailer. Be sure the spotter is always in view of your rear view mirrors. **STOP THE VEHICLE IF YOU CANNOT SEE YOUR SPOTTER.**
- Always chock trailer or towed vehicle wheels when disconnected from the towing vehicle (motorhome) or when parking on an incline.

Reference:
https://www.gmc.com/gmc-life/trucks/tips-for-safe-trailering-and-towing

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Exterior

Your Class B motorhome comes equipped with several factory-installed exterior devices with features designed to enhance your RV traveling experience. These features are covered in this section.

Awning (if equipped)

⚠ CAUTION

Keep hands away from awning mechanisms while in operation. Some mechanisms present pinch points that can cause severe injury.

In the event of power loss or awning motor failure, the awning can be retracted manually. Consult the awning manufacturer's instructions for manual awning retraction. Never drive or move the vehicle while the awning is extended.

⚠ CAUTION

- **If threatening weather approaches, retract the awning.**
- **If the awning is retracted while wet, extend it as soon as possible to allow it to dry.**
- **Do not drive during periods of extreme high winds. Doing so may cause damage to the awning; it could possibly unfurl from the stowed position. Any damage to the awning caused by driving under such conditions may not be covered under warranty.**

Awnings can create a pleasant outdoor space that provides shade from the sun and semi-protection from certain weather conditions.

The patio awning operates from the motorhome's 12 volt DC electrical supply. The master battery disconnect switch will need to be ON prior to operating the awning.

TO EXTEND THE AWNING

1. Before extending the awning, ensure there are no obstacles in the path of operation.
2. Provide power to the awning by turning ON the master battery disconnect switch, or operate the generator, or connect to shore power.
3. Press (**do not hold**) the EXTEND switch, located near the entrance door, or on the multiplex touch-screen panel, or remote (see note), until the awning is opened to the desired position.
4. Press the switch again to stop the awning at the desired position.
5. **ALWAYS** Use the adjustable prop rods to support and adjust the angle of the fully-extended awning. Prop rods can be placed vertical to the ground or attached to brackets located on the side of the motorhome. Depending on the awning model, prop rods may be separate or located on the inside edge of the awning fascia.

TO RETRACT THE AWNING

1. Before retracting the awning, ensure there are no obstacles in the path of operation.
2. Collapse and stow the prop rods.
3. Provide power to the awning by turning ON the master battery disconnect switch, or operate the generator, or connect to shore power.
4. Press (**do not hold**) the RETRACT switch, located near the entrance door, or on the multiplex touch-screen panel, or remote (see note). The awning will fully retract, or press the switch to stop at a desired partially-open position.

NOTE: The multiplex system may offer remote control of awnings and other electrical systems via a smart phone or tablet app.

Awning Lights (if equipped)

Your patio awning may be equipped with LED strip lighting or other lighting types. These lights are controlled by a switch located near the Awning EXTEND/RETRACT switch, on your multiplex touch-screen panel, or remote control.

NOTE: For complete awning operation and maintenance information, refer to the manufacturer's owner's guide and/or the TMC Class B Supplement, available through your TMC Owners Resource account.

Lighted Entry Step (if equipped)

Your TMC motorhome may be equipped with a lighted running-board style entry step. The light automatically illuminates when the side sliding door is opened and remains illuminated for a brief time after the door is closed.

Always be sure of solid footing and use hand rails whenever entering or exiting your motorhome.

Roof

⚠ WARNING

The roof of this vehicle is not designed to support people. Do not climb on or walk on the roof. Do not use the roof as an observation platform.

Doing so could result in damage to the vehicle and/or a fall, leading to serious injury or death.

Maintenance of all roof-mounted devices should be done from a ladder or other safe means. Do not climb upon or walk on the roof. Damage to the vehicle's structure and the possibility of an injurious fall exists.

Roof Rack (if equipped)

Your motorhome may be equipped with a factory-installed roof rack system. Cross-members are not included, but are available from the roof rack manufacturer or your dealer. Factory-installed solar panels may be attached on or between the roof rack. Information for the roof rack is included in your TMC Owners' Packet.

Light Bar (optional)

⚠ CAUTION

The light bar installed on this vehicle is for OFF-ROAD use ONLY. DO NOT use the light bar for ON-ROAD illumination. The light bar projects a powerful beam of light, which could be extremely hazardous to oncoming traffic.

Traffic laws may require covering the light bar whenever the vehicle is driven on-road. Always adhere to state and local laws pertaining to the legal use of accessory lighting devices.

Your TMC Class B motorhomes may be equipped with an accessory light bar. This lighting unit consists of powerful flood and spotlights. It is for OFF-ROAD use ONLY. Check state and local laws for regulations that pertain to the legal use of accessory vehicle lighting.

Exterior Ladder (if equipped)

⚠ CAUTION

Never exceed the weight capacity of the ladder. Doing so can lead to ladder collapse and possible personal injury.

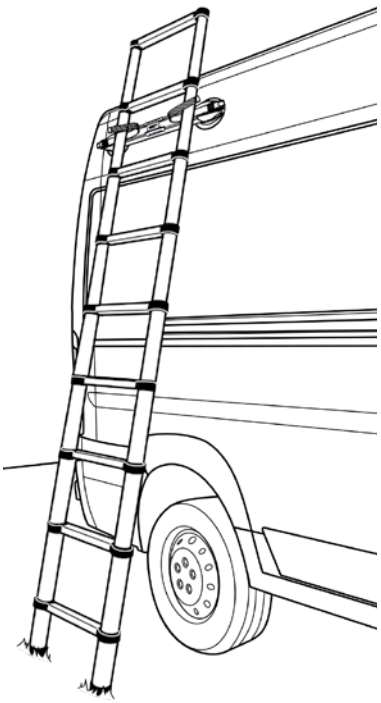
When ascending or descending the ladder, always face the ladder and use a firm two-handed grip.

Always wear shoes that provide good grip. Failure to comply can result in a fall, causing severe personal injury.

Follow the manufacturer's instructions for extending, securing, and collapsing the ladder.

The ladder, if equipped with your vehicle, provides access to the roof for inspection and maintenance of the roof and roof mounted items. Ladder instructions are included in your TMC Owner's Packet.

- Remove the ladder from its storage location and extend the ladder. The ladder has locking mechanisms in each rung. These mechanisms **MUST** be locked in place before using the ladder.
- **ALWAYS** use the magnetic ladder bracket to secure the ladder to the vehicle (see illustration).
- 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.



Ladder and magnetic securing bracket

Collapsible ladder stowed behind rear door. The magnetic ladder bracket is stowed on the inside of the left-side rear door.

- Always use both hands when ascending and descending the ladder.
- Always face the motorhome when ascending and descending the ladder.
- Be careful not to overreach when on the ladder. You could lose your balance, or footing, or fall off the ladder.
- When finished, detach the ladder from the magnetic ladder bracket, then collapse the ladder by pinching the locking mechanisms while sliding the support poles together.
- Stow and secure the ladder and magnetic ladder bracket inside the rear doors.

Side Door Screen (if equipped)

⚠ CAUTION

Do not drive the vehicle while the side sliding door is open.

Do not drive the vehicle while the back door or doors are open. Dangerous exhaust fumes could enter the vehicle.

For convenient ventilation and insect control when parked, your class B motorhome may be equipped with side and rear door screens. Style, actuation, and fastening vary depending on model and floor plan.

TO OPERATE SLIDING SCREEN:

1. From the outside, fully open the right-side sliding door.
2. With even pressure from top-to-bottom, carefully pull the screen from its stowed position across the opening of the right-side sliding door.
3. Reverse this procedure when returning the screen door to its stowed position and when preparing for travel.

Side-door screen. Screens and fastening styles may vary from this illustration

Rear Door Screen (if equipped)

⚠ CAUTION

Do not drive the vehicle while the back door or doors are open. Dangerous exhaust fumes could enter the vehicle.

For convenient ventilation and insect control when parked, a rear door insect screen is available. The screen is held in place with twist fasteners, hooks, or other devices and has a center opening, which is usually held together with magnets.

The screen can be left in place with the back doors closed, or can be easily rolled-up or removed and stowed when not needed.

NOTE: Side and rear door screens may differ from the illustrations here, yet all factory-installed door screens will function as insect control and ventilation devices.

Rear door screen

Bicycle Rack (if equipped)

Your motorhome may be equipped with a bicycle rack attached to the rear door. This rack allows convenient and secure transportation of one or two bicycles. For operational instructions, refer to the manufacturer's owner's guide included in your TMC Owner's Packet.

NOTE: Additional information covering the operation and maintenance of exterior-mounted features and devices of your motorhome may be available through the on-line TMC Owners Resource document service and TMC How-to videos:

www.thormotorcoach.com/owner-resource/

Bicycle rack attached to the rear door

Interior

Your TMC Class B motorhome is well appointed with appliances and entertainment devices that make on-the-road travel convenient and enjoyable. Most floor plans are appointed similar to larger RV's, just on a smaller scale. These features are covered in this section.

Appliances

⚠ DANGER

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

⚠ WARNING

Do not store combustible materials on or near gas appliances.

May cause a fire, 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.**
- **Range covers must be open when the surface burners are in operation.**
- **Improper use can result in death or serious injury.**

⚠ WARNING

IF YOUR MOTORHOME HAS A PRIVACY CURTAIN WITHIN 6 FEET OF THE GAS COOKTOP; do not operate unless the privacy curtain is secured away from the appliance or removed.

May cause a fire, which could result in death or serious injury.

Your Class B motorhome is equipped with a variety of appliances that either operate on electricity, propane gas, or a combination of electric and gas. Due to continuous design updates, complete appliance operational instructions are not included in this manual. Individual component operational manuals are included with your TMC Owner's Packet. Component manuals are also available from the TMC website:

https://www.thormotorcoach.com/owner-resource/

Refer to the specific appliance component manufacturer's owner's manuals for safety, operation and maintenance instructions. If component information is missing from your Owner's Packet, please have the brand, model, and serial number of your specific appliance available before contacting TMC Customer Care or your selling dealership for assistance in obtaining a replacement.

Each appliance in your motorhome is warranted by its manufacturer. It is very important that you review ALL the literature provided in your TMC 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 and Cooling

⚠ DANGER

BE SURE THE FURNACE AND ALL IGNITION SYSTEMS ARE 'OFF' DURING ANY REFUELING AND WHILE VEHICLE IS IN MOTION OR BEING TOWED.

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS APPLIANCE.

⚠ CAUTION

THIS APPLIANCE IS EQUIPPED WITH AN ELECTRONIC IGNITION DEVICE THAT AUTOMATICALLY LIGHTS THE BURNER. DO NOT TRY TO LIGHT THE BURNER BY HAND.

The heating system installed in your motorhome is fueled by propane gas. Please observe all precautions regarding the safe use of LP gas and the LP system installed in your motorhome.

Your motorhome's heating and cooling system consists of equipment sourced from a variety of manufacturers, yet the individual components are designed to function as an integrated system. Depending on floor plan and available features, the furnace installed in your Class B motorhome may provide for room heating only or consist of an appliance that combines room heating and water heating into a single unit. Air conditioners also vary in style, depending on floor plan and available features. Heating and cooling components may have manufacturer's warranties that require product registration. Your dealer can assist you with component registrations.

Detailed information regarding the heating and cooling equipment that is uniquely specific to your motorhome is not covered in this manual. Please review and retain all manufacturer's owner's manuals and documentation that is included with your TMC Owner's Packet. The manufacturers of the heating and cooling equipment installed in your motorhome are the best source for information regarding component features, operation, and maintenance.

Always refer to the manufacturer's documentation if you have questions regarding your heating and cooling system. TMC Customer Care representatives are also available to answer any question you may have; call, toll free at:

877-855-2867.

NOTES:

- State and local laws may restrict the use of propane appliances while the vehicle is in motion. Be sure to follow all regulations regarding the transportation of propane gas.
- For additional information regarding heating and cooling systems installed on your motorhome, please refer to the TMC HVAC System Guide and the HVAC manufacturer's product information available through the TMC on-line Owners Resource Document Service:

https://www.thormotorcoach.com/owner-resource/

Heat-only Furnace (if equipped)

Your Class B motorhome may have a heat-only furnace similar to this illustration. On and off, along with fan and temperature controls are integrated into the multiplex control panel. Be certain not to block the furnace grill with any items, such as luggage, clothing or other cargo.

TO OPERATE:

1. Turn ON the main battery disconnect switch. Doing so provides power for the multiplex system and the furnace controls.
2. Turn ON the main gas valve (see Propane System, Section 9).
3. Locate the furnace controls on the multiplex panel and adjust the temperature to the desired setting. The furnace will cycle on and off as heat demand requires.

Combination Furnace/Water Heater (if equipped)

⚠ WARNING

CARBON-MONOXIDE POISONING HAZARD!

Failure to follow instructions could result in severe personal injury or death due to carbon-monoxide poisoning if combustion gases enter the RV.

Check that all openings in the outside wall around the vent (and air intake) pipe(s) are sealed to prevent combustion gases entering the RV.

Check that furnace vent and air intake are not obstructed in any way.

Never operate the combination furnace/water heater in an enclosed or confined space.

This combination furnace/water heater presents danger of hot surfaces and hot gases. Do not touch the area around the wall cowl and do not lean any objects against the wall cowl (furnace exhaust).

IMPORTANT! Read and follow the manufacturer's instructions regarding safety, operation, maintenance, and winterization of the furnace/water heater.

Your motorhome is equipped with a factory-installed LP-fired combination furnace and water heater, designed specifically for recreational vehicles (also refer to the Water Section of this manual). The furnace/water heater combination unit is a tank design and holds a volume of 2.6 gallons of water. Some models use a combination of LP gas and electric to rapidly heat water and provide warm air.

For complete safety, operational, and maintenance information on the furnace/water heater unit installed in your motorhome, please refer to the manufacturer's instructions contained in your Owner's Packet or visit the water heater manufacturer's website. Product information is also available in the TMC Water System Guide and from the on-line TMC Owners Resource document service. TMC Customer Care representatives are also available to answer any question you may have; call, toll free at:

877-855-2867.

NOTE: DO NOT allow water to freeze within the furnace/water heater unit. When winterizing the water system, the water tank of the unit MUST be drained. DO NOT use compressed air to drain the unit. DO NOT place anti-freeze solutions in the tank of the furnace/water heater unit.

COMBO FURNACE/WATER HEATER CONTROL PANEL

Control settings for the furnace/water heater are integrated into a wall-mounted controller. Refer to the manufacturer's owner's manual or quick start guide for operating instructions.

Furnace/water heater wall-mount controller

For complete operating and maintenance instructions, please refer to the manufacturer's instructions included in your TMC Owner's Packet, or available through the complementary TMC Owners Resource document service.

NOTE: Air conditioners are designed to cool approximately 20 degrees Fahrenheit lower than the outside ambient air. On extremely hot days, the air conditioner may not be able to cool the motorhome to the desired temperature.

During warm weather, it is best to start the air conditioner early in the day, allowing it to cool-down and keep the interior of the motorhome at a comfortable temperature before the outside temperature becomes too warm.

Air Conditioning

ROOF MOUNT

Most Class B motorhome models are equipped with a 120 volt AC roof-mounted air conditioning unit that is controlled from the multiplex touch-screen panel. To operate the air conditioner, the motorhome must either be connected to shore power, powered by the on-board generator, or powered by the optional Li-ion battery system (through that system's special inverter, see Electrical Section). Due to the electrical load of an air conditioner, they are not powered by the standard inverter that is supplied with a generator system.

To set the desired interior temperature, locate the temperature menu on the multiplex panel, select Air Conditioning, and set the desired temperature. The air conditioner will cycle on and off to maintain the desired inside temperature.

ROOM

Due to limited roof space, some Class B models are equipped with portable-style air conditioning unit. Operational controls are NOT integrated with the multiplex system. On/Off and temperature controls are located on the top panel of the unit. For convenience, the unit also is supplied with a hand-held remote control. The room-style air conditioner is powered by 120 volt AC, either by shore power, generator or the optional Li-ion battery system, through an inverter.

Typical room-style air conditioner

Ceiling and Ventilation Fans

Your vehicle may be equipped with high-volume ceiling and ventilation fan(s). If equipped, the fan(s) can be operated as a powered vent; to draw in cool outside air, or as a ceiling fan to circulate the inside air of the motorhome. The fan is equipped with a translucent rain cover.

Refer to the TMC HVAC System Guide for complete operational and maintenance instructions pertaining to motorhome ventilation and fan operation. Also refer to the Care and Maintenance Section of this manual for important condensation information.

Entertainment Systems

TMC motorhomes are factory-equipped with many different entertainment devices, depending on motorhome model, floor plan, and available optional equipment.

For more detailed information regarding a specific component installed in your motorhome please refer to the respective component manufacturer's owner's manuals included your TMC Owner's Packet or download from the Owners Resource section of the TMC website.

Dash Radio

Your motorhome may be equipped with an infotainment dash radio, and depending on model and options, may include Sirius Satellite receiver (subscription required) and navigation, along with Apple CarPlay compatibility (the radio unit, along with included features installed in your vehicle may differ). Refer to your TMC Owner's Packet or TMC's on-line Owners Resource for dash radio information.

NOTE: The dash radio is typically powered by the auxiliary (coach) battery(ies). This is so it can be used as an entertainment device while the vehicle is parked.

While traveling and while parked, the master battery switch must be ON to power the dash radio, along with navigation and camera monitor features.

Cable TV Hook-up

A cable TV hook-up is provided on your motorhome. The connection is located on the road side and is used to connect to an external cable TV signal. Check with the campground management for cable TV hook-up details.

NOTE: If equipped, turn your TV antenna booster ON while watching local television stations (OTA); turn OFF the TV antenna booster when watching cable or satellite.

Television

NOTICE

The television is attached to an adjustable swing/tilt mounting bracket. Ensure the television mounting bracket is securely stowed and locked before travel.

Your motorhome is factory-equipped with a high-definition LED television, which includes HDMI and other media inputs (models and size may vary). Please refer to your TMC Owner's Packet or the on-line TMC Owners Resource for important operational and warranty information associated with your television.

Typical HDTV with swivel mount

WiFi Connectivity (if equipped)

Winegard® ConnecT™ 2.0+ WiFi and 4G LTE extender

Your motorhome may be factory-equipped with a Winegard WiFi extender. Designed specifically for the mobile environment, the ConnecT™ 2.0 is a long-range, high performance WiFi extender that increases the range of existing WiFi hotspots. It maximizes speed and range from both WiFi and 4G LTE networks to keep users connected in all but the most remote areas. The ConnecT™ 2.0 will also accommodate WiFi calling mode in the absence of cell signal inside the RV.

To become operational, the WiFi extender requires set-up procedures that are unique to each unit. Refer to the manufacturer's set-up and operational guide, provided by the manufacturer and included with your TMC Owner's Packet. Contact the manufacturer for technical support.

Beds, Bunks, and Dinettes

⚠ 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.

⚠ WARNING

All swivel seats located in the cab of the vehicle (driver and front passenger) must be in the locked, upright and forward-facing position while the vehicle is in motion and seats are occupied.

Driver, front passenger and all occupants must always wear seat belts while the vehicle is in motion.

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

⚠ WARNING

Beds and bunks that convert to passenger seating for travel must be converted fully to upright seating and have the occupant seat belts properly routed and worn by traveling passengers.

Failure to do so could lead to serious injury or death.

Motorized bench seat and actuation switch

An example of a typical dinette and bed conversion

The non-cab seating of your motorhome is designed to conveniently convert into bunks and beds. Each floor plan offers unique bed arrangements and conversions. **NEVER OCCUPY BEDS OR SEATS IN THE RECLINING POSITION WHILE THE VEHICLE IS IN MOTION.**

Conversion of seating to beds varies depending on floor plan and features. Some seating is motorized, which requires that the main battery switch be in the ON position for operation. Be sure that whenever converting seating to beds that fingers and other bodily parts remain away from potential pinch points and that support bars and slats are securely in place.

TMC Class B models offer a wide variety of passenger seating and bed conversions. Bed conversion instructions, along with dinette and other interior details are provided in through the Thor Motor Coach Owners Resource.

SkyBunk® (optional)

Available on several models of TMC Class B motorhomes is the SkyBunk that provides additional sleeping and lounging space for traveling convenience. The top is constructed of durable GRP material and is lined to provide excellent thermal insulation and soundproofing qualities.

The roof can be easily raised and lowered, due to the pneumatic cylinder-assisted scissor lift mechanism. For comfort, the SkyBunk includes a full-sized mattress. The high-quality side fabric is flame-retardant and includes windows which have zippered covers and fly screens.

SkyBunk®

The front window can be fully zipped-open, offering an unencumbered view and emergency escape path. The side curtains can be zip-opened for ventilation. A folding mechanism automatically pulls the fabric inward when the roof top is closed–keeping the fabric from getting caught between the bodywork and the top.

NOTE: Before raising the SkyBunk, ensure there is adequate space above the vehicle to fully raise the top.

Ladder access to SkyBunk®

Raising the top

⚠ CAUTION

Elevated beds can present a fall hazard which may result in severe injury.

The sleeping and lounging area is accessed via a ladder. Never exceed the weight limits of the ladder and sleeping/lounging area.

Failure to comply with the load capacity of the access ladder could result in severe injury.

Using entry and exit devices other than the access ladder could result in a fall or severe injury.

This bunk area should never be occupied by more than two people at a time.

This bunk area is not equipped with safety netting or safety rails. Use extreme caution when children occupy this area. Installing safety netting is strongly advised.

Do not allow adults, children, or pets in the bunk area if the top is not in the fully open position.

NEVER OCCUPY THE BUNK AREA DURING TRAVEL OR ANYTIME THE VEHICLE IS IN MOTION.

⚠ CAUTION

Only open the SkyBunk top when the vehicle is parked on solid and level ground. Always close the SkyBunk top before moving the vehicle. Never drive the vehicle with the top raised.

Always use the locking mechanisms to secure the top before moving the vehicle; if not, severe damage to the top and the vehicle is possible.

1. Locate the latch mechanism and insert the key. Turn the key and press the key-cylinder to release the latch.
2. Push the forward portion of the top upward to open and continue pushing upward until the top is fully extended. The careful placement of a broom handle can be used as an aid in pushing open the top. **BE CAREFUL NOT TO PUSH ON THE SKYLIGHT OR SKYLIGHT FRAME.** or;
3. Carefully secure the ladder hooks into the brackets located along the back edge of the access hatch. While ascending and keeping a firm grip on the ladder, push the top open with a free hand. **DO NOT TO PUSH ON THE SKYLIGHT OR SKYLIGHT FRAME.**

Latch mechanism with keyed lock

NOTE: Latching mechanisms and operational instructions may vary due to product and/or supplier changes.

Lowering the Top

NOTICE

Ensure the soft sides of the top are dry before closing.

If it is necessary to close the top while the sides are still wet, open the top at your earliest convenience to allow the sides to air-dry.

1. Ensure all bedding, clothing, and devices are removed from the bunk area. The mattress can remain in the bunk area.
2. Zip close the soft window openings.
3. Pull down equally on both left-side and right-side pull-down straps. If you cannot reach the pull-down straps from the floor, carefully ascend the ladder in order to reach the straps.

   As you pull the top closed, the soft sides will automatically fold inward.
4. Continue pulling down on the straps until the top latches, then lock in the closed position for travel.

NOTE: It may be necessary to tuck the side fabric towards the outside edges of the closed top.

Illustration of the side window and black pull-down straps

Canvas Care

VERY IMPORTANT-The fabric must be completely dry before storage! Storing a wet or damp tent, even for a short time, can ruin it and void the warranty.

TO CLEAN THE CANVAS

- Hose down with water and wipe with a cloth. Soaps and detergents can damage the water-repellent treatment of the canvas.
- Do not spray insecticides or bug repellent directly on the canvas. This may damage the water-repellent treatment.
- For long-term storage, store in a cool dry location that is not exposed to direct sunlight.
- The SkyBunk is made with quality zippers. To prolong zipper life, do not "grind" zippers around corners. If needed pull the canvas, windows or doors to help zippers glide smoothly. Keep them clean from dirt.
- The canvas on your SkyBunk has a special Hydra-Shield™ treatment that is watertight yet breathable. You should rarely, if ever have to retreat the canvas. If you do need to spot treat the canvas for water repellency, use a silicone based repellent such as Camp Dry® by Kiwi®. Other treatments will clog the tiny holes in the canvas eliminating its breathability.

Other Notes

- Condensation inside the SkyBunk is affected by the difference between inside and outside temperatures, and humidity. Condensation can be reduced by opening a vent.
- Some slight irregularities are normal with cotton canvas and will not affect the performance of your SkyBunk.

NOTE: Winter camping can be an enjoyable experience. Simply follow all previously listed care and precaution instructions.

7

Skylight

⚠ CAUTION

The skylight is NOT designed to be an emergency escape hatch.

Skylight and built-in sun shade

Figure 1

Figure 2

Figure 3

Most Class B models feature a large, easy-to-open skylight. The skylight is opened by pulling and rotating the bar-lever. Returning the lever to its stowed position will close and latch the window.

OPENING THE SKYLIGHT

1. While pressing the latch-lock, pull the bar-lever in a downward direction (Figure 1).
2. Continue to rotate the bar-lever in a downward and backward arc, which opens the skylight (Figure 2).
3. Place the bar-lever end in a fully open or in one of the partially-open positions (Figure 3).

CLOSING THE SKYLIGHT

Move the bar-lever in a downward arc, then upward until past the lock-latch.

SUN SHADE

The Skylight has a built-in sunshade. To close, simply pull the shade across the opening.

Convenience Tables

Included with some floor plans and located just inside the motorhome's sliding door is a convenience table stand and grab handle. The tabletop creates a stow-able work surface and the base contains electrical outlets for operating electronic devices. Both front driver and passenger seats rotate to the rear and recline, creating a comfortable seating area.

OPENING AND STOWING THE TABLE

1. Flip open the top panel of the table stand. It hinges towards the outside.
2. Reach in and pull up the tabletop vertically to the end of travel.
3. Rotate the tabletop to its horizontal position.
4. Close the table stand top panel.
5. Reverse this procedure to stow the table.

NOTE: The table top is not supported by props or brackets. Do not exert excessive pressure or weight on the table top.

Flip-up convenience table

Convenience table offered on some models. To open, simply press on the top edge to unlatch. Gently lower the table. To close, lift the table to the stowed position and press the top edge to latch.

Storage

⚠ CAUTION

- **When traveling, items stowed in overhead cabinets can shift. To avoid injury from falling objects always open overhead cabinet doors cautiously.**
- **Do not allow children to play within storage compartments. They could become entrapped and suffer severe physical harm.**
- **It is not recommended to stow items or gear near electrical, heating, or water-system equipment. Ensure all electrical and heating devices are surrounded by free-flowing ventilation.**

Ensure that stowed items do not interfere with ventilating space required for items such as electrical and electronic devices, furnaces, water heaters and other components.

Over-cab Storage

There is an over-cab storage bin available, directly above the front driver and passenger seating. Only stow light-weight items, such as jackets, blankets, and pillows in this storage bin.

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Electrical System

⚠ WARNING

Whether a device or appliance operates on 120 volts AC or 12 volts DC, great care must be observed while using any electrical device and working with electrical wires and connections. Although all electrical circuits of your motorhome are protected by either fuses or circuit breakers, the electrical system has the potential of delivering dangerous electrical shock or the possibility of fatal electrocution. A qualified electrical technician should perform all maintenance and repairs to the wiring, devices, or components of the electrical system.

NOTICE

During very cold or very hot weather conditions, the image on touch-screen control panels (radio, multiplex, and other liquid crystal display (LCD) panels may appear unclear or react slowly. Once the interior temperature of the motorhome stabilizes, normal LCD panel display and operations will resume.

Introduction

Your motorhome's electrical system is designed to provide safe, reliable energy to power the mobile features that enhance the RV'ing experience. The electrical system is a blend of two distinct electrical platforms, consisting of an 120 volt alternating current (VAC) system, and a 12 volt direct current (VDC) system. The 12 volt DC system is further segregated into the coach and the vehicle segments. Both the AC and DC power systems are required in order for your motorhome to function as intended.

Most of the electrical components of your motorhome are designed to operate on 12 volts DC. This includes lights, furnace and water heater control, water pump, powered ventilation fans, awnings, and some appliances. While other features, like the microwave oven, air conditioner, TV's, and DVD players operate on 120 volts AC. Provided with your motorhome are power outlets for both 120 volts AC and 12 volts DC; so that you can conveniently power portable appliances you bring along while traveling.

NOTE: Due to model variations, options, and continuous production changes offered by TMC, wiring diagrams are not included in this manual. Any specific questions you may have regarding the electrical system of your motorhome should be directed to your Dealer or to TMC's Customer Care.

12 Volt Power System

Power for the 12 volt DC electrical devices installed in your motorhome is supplied either by the on-board battery(ies) or by the converter when connected to shore power or when the generator is operating.

There are several devices of the electrical system that are designed to control 12 volt power to and from the motorhome's auxiliary (coach) and chassis batteries. Battery power management is important in order to:

- Turn the 12 volt electrical power ON and OFF
- Charge the auxiliary and chassis batteries
- Manage battery power output
- Monitor battery charge condition
- Control 12 volt devices

Following, is a brief description of the electrical devices used to control the 12 volt power system of your motorhome.

Master Battery Disconnect Switch

NOTICE

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

The master battery disconnect switch is typically located just inside the motorhome's main entrance. It is used to connect power from the auxiliary battery(ies) to the motorhome's 12 volt DC electrical system, hereby providing power to the motorhome's interior lighting and other 12 volt DC devices.

Master battery disconnect switch

USING THE MASTER BATTERY DISCONNECT SWITCH

It is good practice to turn the master battery disconnect switch ON when first entering the motorhome and leave the switch ON whenever the motorhome is occupied, whether parked or traveling.

- This will energize the 12 volt electrical system, so that interior lights, appliance control circuits, and other 12 volt devices can be used.

- This provides charging voltage to the auxiliary battery(ies) via the vehicle's alternator (when traveling) or by the converter when connected to shore power or using the on-board generator.
- This will provide power to the dash radio, which is powered by the auxiliary battery(ies). Therefore, keeping the master battery disconnect switch ON while the motorhome is in motion, will allow the use of the dash radio and driving cameras, which in most installations, use the dash radio display for rear view and side view camera monitoring.
- When leaving the motorhome unattended for a few hours or more and not connected to shore power, turn the master battery disconnect switch OFF to conserve battery power, unless you need to keep an appliance, like your refrigerator, operating.
- When connected to 120 volt shore power or the on-board generator is being used, the 12 volt system is powered through the converter, therefore, the master battery switch is not controlling 12 volt system power. However, when connected to shore power or operating the on-board generator, charging voltage is provided to the auxiliary battery(ies) whenever the master battery disconnect switch is ON. Similarly, the master battery disconnect switch must be ON in order for charging energy from the solar charging system to connect to the auxiliary battery(ies).

Rapid Camp+® Multiplex Control System

Your motorhome is equipped with multiplex wiring systems. A multiplex system uses low-voltage, digital signals to control the electrical and electro-mechanical devices within your motorhome via a main system controller and an intuitive, user-friendly touch-pad.

Multiplex main control panel. Panels and features vary depending upon model, floor plan, and options.

Control functions vary from motorhome to motorhome, depending upon the standard and optional equipment available. However, in its typical configuration, a multiplex system will allow the user to monitor and operate these features from the main touch screen panel:

- Awning
- Lighting
- Fans and ventilation
- Climate (HVAC) controls
- Holding tank monitoring
- Water pump on/off
- Electrical system monitoring; both AC and DC
- Battery monitoring and charge status
- Generator on/off
- AGS settings and controls
- Shore Power Fault Warning

Basic Multiplex Operation

Depending on the model and floor plan of your motorhome, it may be supplied with a multiplex control system from a variety of manufacturers. However, every multiplex system is designed to be intuitive to operate. Basic operation involves these steps:

1. Ensure power is ON, either from 12 volts DC (main battery switch) or 120 volts AC (shore or generator power). With a power source ON, locate the main system panel. Some system panels will automatically 'turn on' when power is present, while other panels will require the user to press a button on the panel, or touch the display.
2. Select the feature or feature menu you want to control. Some panels will have feature icons along one edge of the panel, while other panels will have feature icons displayed on the panel's touch-screen.
3. With the feature menu selected, operate the control. For example, turn on or off the lights, raise or lower the temperature, turn on or turn off the generator, etc.
4. Return to the main menu by either pressing the 'Home' icon, located along the bottom edge of the panel, on the touch screen, or on some panels, press a return arrow on the display.

Most multiplex systems include individual wall switch panels located in the bathroom for control of lights, fans, etc. Remote switches are usually linked to the main system controller by wireless Bluetooth signals.

BLUE TOOTH PAIRING

From time to time, it may be necessary to re-pair the touch screen panel with the system control board. The pairing

operation is different depending whether the installed touch screen panel has physical switch buttons on its front or not. For touch panels without front switch buttons, pairing is accomplished by pressing and holding the bathroom fan switch. Some systems may have a separate pairing switch located in an overhead compartment near the touch panel.

For pairing and additional multiplex information and operational details, refer to the TMC Class B Supplement or the multiplex system manufacturer's owner's manuals available on-line through your TMC Owners Resource account. Additional information is also included with your TMC Owner's Packet and through how-to videos, available on TMC's YouTube site:

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

NOTE: Most multiplex systems offer remote control via a smart phone app. Refer to the manufacturer's information included in your Owner's Packet.

Monitoring Battery Condition

The charge condition of the auxiliary and chassis batteries can be checked with the Battery Condition Monitor, located on the Energy Center menu of the Multiplex Panel.

TO OPERATE:

1. Turn ON the Multiplex Panel.
2. Select the Energy Center menu (along the left side of the screen).
3. The condition of the auxiliary and chassis batteries is displayed in DC voltage.

NOTE: This battery condition monitor is designed for standard chassis and house batteries (lead-acid, AGM type). Refer to the Re(li)ableTM Battery System section for lithium battery monitoring.

Auxiliary Battery(ies)

⚠ WARNING

- **Do not store items in the battery compartment or near the battery(ies) that might come in contact with the battery terminals. This could cause an electrical short circuit, drain the battery, cause a spark, or ignite combustible materials.**
- **Keep sparks, cigarettes and flames away from the batteries as the hydrogen gas they create may ignite.**
- **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.**
- **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.**

Unless your motorhome is equipped with the optional Re(li) able Lithium Battery Power System, your motorhome is supplied with lead-acid, deep-cycle type storage battery(ies), similar to the batteries found in recreational boats and golf carts. Deep cycle batteries are designed to be less susceptible to internal damage when operated in cycles of near depletion (discharge) and full recharge. Depending upon the features installed, the motorhome may be supplied with more than one auxiliary battery. Auxiliary batteries are typically located underneath the motorhome, secured and protected by brackets.

NOTES:

- Use the multiplex display panel to check the condition of the auxiliary battery(ies). A fully charged lead-acid battery will read 12.7 volts DC. A lead-acid battery is considered discharged at 11.8 volts DC by electronic standards.
- When voltage drops below these levels, permanent damage may occur. Due to their large energy storage capacity and depending on the rate of depletion, it may take up to 24 hours for a lead-acid battery to fully recharge.

Emergency (Auxiliary) Start Switch

NOTICE

Turn off all 12 volt DC devices before using the emergency start feature. This will help ensure that all available energy stored in the coach battery(ies) can be used for vehicle starting.

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 coach battery(ies) to the vehicle's starting circuit to provide additional starting power.

This feature is used for situations when the chassis battery is too depleted to start the vehicle on its own. Connecting the coach battery(ies) to the engine starting circuit may provide the needed energy to start the motorhome's engine. When the Emergency Start Switch is released, the coach battery(ies) are disconnected from the engine starting circuit.

This feature is available on ProMaster-based Class B motorhomes with either standard AGM batteries or the optional Li-ion battery power system.

TO OPERATE:

1. Ensure the master battery switch is ON.
2. Depress and HOLD the 'EMER START' switch, located on the front driver's dash.
3. Use the ignition switch (key or start button) to start chassis engine.
4. Release the 'EMER START' switch after the engine has started.

NOTE: When using the Emergency Start feature, do not hold the ignition key in the start position for more than 30 seconds.

OTHER EMERGENCY STARTING TIPS: If your vehicle battery is too depleted to start the engine, and the coach battery(ies) is also too depleted, try operating the generator for a short period. This might provide enough charging energy to allow the vehicle to be started via the Emergency Start feature.

NOTE: The Emergency Start feature is not available on Sprinter-based Class B motorhomes.

Battery Isolation Relay

⚠ CAUTION

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

- **Reduce the risk of unnecessary chassis battery drain.**
- **Allows the battery isolation relay to connect the auxiliary battery to the coach charging system.**

When the motorhome's engine is running and the master battery disconnect switch is ON, the vehicle's charging system is connected to the auxiliary (coach) battery(ies) through the Battery Isolation Relay. This connection provides charging energy to the auxiliary battery(ies) when traveling.

When the motorhome's engine is not running, the chassis and auxiliary battery(ies) are electrically isolated by the use of a battery isolation relay. This device prevents coach power consumption from discharging the chassis battery while the motorhome is parked.

ADDITIONAL CHARACTERISTICS OF THE BATTERY ISOLATION RELAY:

1. The battery isolation relay electrically delays connecting the auxiliary batteries to the vehicle charging system for approximately 15 seconds; this allows the alternator time to reach full charging ability.
2. After this initial time delay, the battery isolation relay senses the voltage of the vehicle charging system. The isolator connects the auxiliary 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 battery isolation relay will disconnect the auxiliary batteries from the vehicle's charging system 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 battery isolation relay allows vehicle starting from the auxiliary battery(ies) via the Emergency (Auxiliary) Start Switch.

Chassis Alternator

The 12 volts DC chassis alternator supplies power to both the automotive systems as well as the auxiliary batteries while the motorhome's engine 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 charging of the automotive and auxiliary batteries.

When driving, if the alternator is not keeping pace with the draw on your motorhome's electrical system, it means it is working in a negative mode; more power is being used than the alternator is capable of supplying. If you draw too much power from your batteries there may not be enough power left to start the motorhome or run 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 drop back to 'normal' and hold its own even when you turn on lights or appliances.

If the alternator shows a discharge while the vehicle's engine is running, turn OFF appliances and lights to see if a charge comes on or if the alternator indicates 'neutral.' Then apply a load (turn ON a 12 volt DC appliance) on the system to see if a discharge returns. If a discharge persists, your alternator may not be working correctly; contact your dealer.

NOTE: If your motorhome is equipped with the optional Re(li)able Battery Power System, there is an additional alternator installed on your vehicle that is specifically designed to charge the lithium-ion battery system.

Battery Access

⚠ CAUTION

Due to the mounting position of the auxiliary batteries, they may be subject to damage due to road hazards or other travel-related issues.

Regularly inspect the batteries for damage. Be extremely cautious of leaking batteries and loose or damaged electrical connections.

Do not use the 12 volt battery system if any battery damage is detected and until proper repairs are performed.

The auxiliary batteries are located underneath the vehicle, secured by mounting brackets. The vehicle must be raised to access the batteries. Always secure a raised vehicle with jack stands or other devices. Refer to the vehicle manufacturer's owner's manual for proper jacking procedures.

For long battery life, it is important to keep your motorhome batteries fully charged as much as possible. Turn OFF lights and other 12 volts DC components when they are not being used. Connect the motorhome to a 120/220 volts AC power source (shore power) whenever possible.

Battery Charging

It is important to keep the auxiliary battery(ies) in a condition of full or near-full charge. Doing so will ensure you will have enough stored 12 volt DC energy when needed. Battery charging is accomplished by:

- Automatic charging through the converter (shore power or generator);
- With the vehicle engine running, auxiliary battery(ies) are charged via the chassis alternator (when Master Battery Disconnect Switch is ON);
- Auxiliary battery charging via solar charging system (equipped as standard, optional, or customer installed).

Take time to turn off all lights or other 12 volt accessories when not in use. Connect the motorhome to a 120 volt AC external source or run the generator whenever possible. Doing so will keep the auxiliary batteries charged.

The auxiliary batteries are a deep-cycle type and are capable of being deeply discharged and rebound to full capacity when recharged. Due to their large energy storage capacity, the auxiliary battery(ies) may take up to 24 hours to completely recharge.

If for any reason, you recharge a auxiliary battery with a charger or power source other than what was supplied as part of the motorhome's original electrical system, make sure to follow all battery maintenance and safety instructions from the battery and battery charger manufacturers.

NOTE: The Master Battery Disconnect Switch must be ON in order to charge the battery(ies) by any on-board method described in the following sections.

Charging by the Vehicle's Alternator

The motorhome's electrical system is wired so that when the vehicle's engine is running, and the chassis alternator is properly operating, charging voltage is supplied to both the chassis and coach battery(ies). The master battery disconnect switch must be ON in order for the coach battery to be charged by the chassis alternator (see Chassis Alternator and Battery Isolation Relay Sections).

Charging by the Converter

The Converter is a 12 volt power supply, which operates on 120 volts AC (see Converter section) and is designed to power the 12 volt system when the motorhome is connected to shore power or when the generator is running. The Converter also provides charging energy for the auxiliary (coach) battery(ies).

If the battery condition is below its full charge, the charger will begin recharging the auxiliary battery at a rate that reflects the level of discharge. When the battery is fully charged, the charger drops its charging level back to a maintenance or trickle level to keep the battery fully charged.

Charging by Solar Energy

Your Thor Motor Coach motorhome may be factory-equipped with a solar battery charging system. Consisting of a solar charge controller, along with a roof-mounted solar panel. This system is designed to provide an alternate battery charging method for your auxiliary (coach) battery(ies).

The solar charging system seamlessly integrates with your motorhomes 12 volt DC power system. **The auxiliary batteries are automatically charged when the solar charge controller is ON. The master batter disconnect switch must also be ON.** The solar charge controller provides monitoring of battery condition, monitoring of the charge energy being supplied by the solar panel(s), and regulation of the charging energy.

When the controller senses that the auxiliary battery(ies) require a rapid-charge, the controller allows the full energy from the solar panel to charge the battery. When the battery(ies) reach 100% state of charge, the controller reduces charge energy to a trickle charge level, thus protecting the battery(ies) from damage caused by overcharging.

The maximum input current rating of the solar controller is 10 amps (energy supplied by the solar panel(s). The typical factory-installed solar panel is rated for 100 watts (peak), with some installed solar panels having a rating of 190 watts (peak power). The output charge voltage is up to 14 volts DC. Solar panel(s) installed on your motorhome may vary from these specifications; refer to your Owner's Packet for details.

NOTES:

- The factory-installed solar charging system is designed and programmed to work with the factory installed battery system, whether the batteries are lead-acid, AGM, or lithium. If you replace the factory-installed batteries with another type, be sure to re-program the controller so that the charging operation matches the batteries.
- The solar charge controller and associated solar panel is not designed to directly power the appliances and/or electric components installed in your motorhome.
- All 12 volt systems and components are either powered directly from the auxiliary batteries or through the converter, which receives input power from either the on-board generator or external shore power service.
- Peak solar panel power is obtained with full and direct exposure of sunlight. Atmospheric conditions determine the available power from the solar panel(s).
- For details regarding your solar panel and solar charge controller, refer to the manufacturers owner's manuals included with TMC Owner's Packet or available through the in-line TMC Owners Resource service.

Solar Charging, 10 amp Controller

⚠ CAUTION

Battery type selection on the controller determines charging parameters that best suit the battery type. Incorrect battery type selection settings may damage the battery.

When installed, a 10 amp solar charging system includes 1 - 10 amp solar controller and 1 - 100-190 watt solar panel. This factory-installation is wired with 10 gauge wire from the solar panel to the solar controller and to the auxiliary battery(ies). Due to controller capacity, it is not recommended to add additional solar panels to this system.

Operating Instructions

1. Turn ON the solar charge controller. Check the battery manufacturer's specification to select correct battery type. The controller provides 4 battery types for selection: Gel, AGM, WET (conventional lead acid), and Calcium. Check the label on the battery to determine the type.

2. Press **BATTERY TYPE** button and hold for 3 seconds to enter the battery type selection mode. The battery type selected will display on the LCD panel. This setting is placed in the controller's memory.

3. With the battery type selected, the solar charger is ready to use. The LCD displays the charging states as below. Pressing the **AMP/VOLT** button sequences through these displays:
   - Battery Voltage;
   - Charging Current;
   - Charged capacity (amp-hour); and,
   - Battery Temperature (if an external temperature sensor is connected).

4. Turn ON the master battery disconnect switch to connect the solar charger to the auxiliary battery(ies).

Once the battery type is entered into the controller's memory, it does not need re-setting, unless the auxiliary battery(ies) are replaced with a different type.

Typical 10 Amp Solar Charge Controller

Solar Prep

If your Class B motorhome is not equipped with a factory-installed solar charging controller, it may be pre-wired for a dealer or owner-installed solar charging system. If so, there will be a Solar Prep Label affixed to the panel where a factory-installed solar controller is to be mounted.

Solar Panels

⚠ CAUTION

Due to the solar panel mounting position, which is usually between the roof-rack rails, be extremely cautious when carrying cargo on the roof rack. Never place items directly on top of the solar panel. Any amount of cargo weight that is in direct contact with the solar panel could easily and permanently damage the solar panel.

NOTICE

When installing a roof-mounted solar panel(s), ensure they are securely attached to mounting brackets and to structural components of the motorhome's roof. All mounting points and wiring ports need to be well sealed from moisture intrusion.

Your motorhome may be equipped with a 100 watt or 190 watt solar panel as a standard factory-installed feature. When installed, a solar panel and associated power controller becomes part of the auxiliary (coach) battery charging system.

The wattage rating of your solar panel was derived by a standard test method that all solar panel manufacturers use. This rating represents the solar panel's peak output under ideal conditions of sunlight intensity, direction, cleanliness of the surface and temperature of the panel. There are many atmospheric factors and physical conditions that will affect the output of your solar panel. On average, however, you should expect the output of your solar panel to be approximately 75-80 percent of its peak rating.

Typical solar panel installation

Battery Maintenance: Lead Acid Type

⚠ 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.**
- **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 SHORT ACROSS THE BATTERY TERMINALS. The spark could ignite the gases. Do not wear metal jewelry, such as rings, watches, or metal wrist bands when working on a battery.**
- **Before doing ANY work on electrical system, disconnect battery cable and the 120 volt power cord. Do not reconnect the cables until all work has been completed. This will avoid the possibility of shorting or causing damage to electrical components or shock to the servicing person.**
- **Battery electrolyte is a corrosive, poisonous, sulfuric acid. Avoid contact with skin, eyes, clothing, or any painted surface.**

⚠ WARNING

ALWAYS WEAR SPLASH PROOF SAFETY GLASSES OR FACE SHIELD AND USE ACID-PROOF RUBBER GLOVES WHEN HANDLING AND WORKING WITH LEAD-ACID BATTERIES.

Proper battery maintenance is important in order to ensure the battery retains its power delivery capacity while prolonging its useful life. Listed here are a few instructions for maintaining and servicing batteries. These instructions apply only to batteries which are NOT maintenance-free, or sealed batteries. The coach batteries supplied with your motorhome may not be the sealed type, however, the chassis battery may be a maintenance-free, sealed type battery. Do not open or break seals on maintenance-free batteries.

1. Keep the battery mounted securely. Routinely check the battery terminals for loose battery clamps. Tighten when necessary.

2. Keep battery hold downs and trays clean and free of debris and corrosion.

3. Check the electrolyte level of the coach batteries at regular intervals. Keep each cell filled to just above the plates with DISTILLED water only. Once the plates have dried out, they cannot be reactivated, and the capacity of the battery is reduced in direct proportion to the area of plate surface that has become dry. This kind of damage can occur quickly. If the fluid level is low, simply add distilled water.

4. Be cautious when removing battery fill caps. Pry off caps carefully. Forcing caps off can cause the electrolyte solution to splash. Electrolyte solution can burn, and even small amounts can damage eyes and skin. Always use proper personal protective equipment when working with batteries.

5. Keep the battery terminals clean. Corroded terminals make poor electrical contact and will prevent normal operation of the 12 volt system. Battery terminal corrosion occurs when the battery has been standing in a discharged condition over a long period of time, or when the battery has been operated continually in a state of partial discharge. Use a baking soda solution to neutralize the corrosion on the battery terminals and cable clamps. Do not allow the soda solution to enter the battery. Make sure the vent caps are secure. Flush with water. Thoroughly dry all cables clamps and terminals, reinstall, and use a battery terminal protecting spray or compound, available at automotive parts or auto service centers.

6. Check the outside condition of the battery. Look for cracks in the case or vent plugs. If the case is cracked, the battery must be replaced. If the vent plugs are cracked, they must be replaced.

7. Keep the battery in a full-charged condition. This will help prolong its useful life and help maintain its charge-holding capacity.

8. Watch for overcharging. Three indications of overcharging are:

   a. Active material on the vent cap (heavy deposit of black lead-like material on the underside of the vent cap)

   b. Excessive use of water or water escaping at vent caps

   c. Abnormal voltage regulator output

9. When removing a battery, disconnect the ground battery clamp first. When installing a battery, always connect the grounded battery clamp last.

10. When replacing batteries, make sure the new battery is the same type and rating of the battery that was originally equipped with your motorhome. If in doubt, consult your RV dealer for advice on battery replacement.

NOTES:

- Only use distilled water when filling battery cavities. Be careful not to overfill battery cavities and never move or travel with a battery that is uncapped.
- Use a battery terminal conditioning spray (available at auto parts stores) to prevent battery terminal corrosion.

Battery Storage

To prevent coach battery discharge when the motorhome is not connected to power through the shore line power cord, turn OFF the main battery switch and disconnect the negative battery cable at the terminal.

If the motorhome is connected to power through the shore line power cord, it is recommended the main battery switch be left ON (do not disconnect the battery(ies). This will allow the converter, inverter (if so equipped), or solar panel (if so equipped) to trickle charge the coach battery(ies).

Battery Replacement

⚠ WARNING

TO PREVENT HAZARDS FROM DANGEROUS BATTERY GASES:

If replacing or adding additional batteries to the 12 volt electrical system, ensure batteries are always located in a well-ventilated area and separated from the living space of the motorhome.

When replacing batteries, make sure the new battery is the same type and rating of the battery that was originally equipped with your motorhome. If in doubt, consult your selling dealer or a qualified RV technician for assistance. Always re-connect the battery cables in the original factory-installed positions.

- Do not replace a deep cycle battery with a starting battery. Only use deep cycle batteries for your motorhome's coach application.
- Do not replace your chassis, or starting battery with a deep cycle battery. A starting battery is designed to deliver higher instant amperage, needed to start the vehicle's engine.
- Check to be sure the replacement battery will fit the battery tray of your motorhome. Group 24 batteries are physically smaller than Group 27 batteries.

Inverter (standard)

⚠ CAUTION

The standard inverter installed in your motorhome is not rated to supply the electrical energy for the roof air conditioner. Use shore power or generated power (from the generator) to power the roof air conditioner.

NOTICE

Inverters are rated in wattage, which is the maximum electrical energy they can deliver. Do not attempt to operate higher electrical loads than the inverter is designed to supply.

Your motorhome is equipped with a factory installed inverter that converts 12 volts DC, supplied by the auxiliary battery(ies), to usable 120 volts AC. It provides continuous AC power to appliances, entertainment devices, and select circuits. Use the inverter to power small 120 volt AC appliances when shore power is not available and when operating the generator is not permitted or feasible.

A remote panel may be installed that duplicates the ON/OFF power switch and other functions located on the front panel of the main unit. In addition to the power switch, the remote panel features a green power status LED. The inverter should be turned OFF when the motorhome is in storage.

NOTE: Inverters that are factory supplied with the optional Re(li)able Battery Power System have a higher output wattage rating as compared to the standard inverter. This higher wattage unit is capable of supplying enough energy to operate the coach air conditioner and other 120 volt AC appliances.

Inspection and Maintenance

If the inverter is not functioning check both the circuit breakers protecting the inverter input, and 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's cooling fins and the cooling fan should be kept clear of any obstructions. If you have further concerns contact your dealer or TMC Customer Care.

Re(li)able™ Battery Power Systems

⚠ DANGER

WHEN REPLACING AND TRANSPORTING BATTERIES, MAKE SURE THAT:

- The battery remains in its original housing or container
- The battery remains in an upright position
- Soft straps are used to avoid damage
- Avoid being underneath the battery during removal and replacement
- Only lift the battery by its handles
- Always handle the battery with care

⚠ WARNING

Read and follow all manufacturer's safety precautions and operational instructions for the Li-ion battery power system; including the battery pack, system control panel, inverter/charger, and auto-start module.

Ensure all users are fully familiar with the battery power system's operation and safety instructions.

Serious injury, fire, or system damage could occur.

⚠ WARNING

The battery(ies) contain hazardous materials that are contained safely during normal use. Do not crush, open, or drop the battery. Do not touch or ingest any of the released material or inhale released gasses when accidental leakage of the battery occurs.

Should skin contact, eye contact, or inhalation occur, perform the necessary first aid measures immediately. Refer to the Material Safety Data Sheet for Mastervolt Lithium-ion batteries, which is available on the web: www.mastervolt.com.

⚠ WARNING

Simultaneous contact of the positive terminal and negative terminal with a metal object will cause a short-circuit of the battery. Short-circuit may result in fire, explosion, electric shock, or release of toxic gas.

Use insulated tools only and keep metal objects away from the battery. Do not wear watches, bracelets, necklaces, or other metal objects when working on the battery. In case of fire, take necessary firefighting measures immediately. Refer to the Material Safety Data Sheet for Mastervolt Lithium-ion batteries, which is available on the website: www.mastervolt.com.

⚠ WARNING

The battery area/compartment for the system's Li-Ion battery(ies) is designed for the use of non-vented batteries only.

Do not place a battery that requires venting into this area/compartment. Vented batteries can release poisonous and flammable gasses.

Can lead to a fire or explosion and result in death or serious injury.

⚠ WARNING

Short circuits, too deep discharges, and too high charge currents will damage the battery and may result in fire, explosion, electric shock, or release of toxic gas. Always install an external safety relay!

NEVER CHARGE A BATTERY:

- When the safety relay(s) have tripped
- After it was discharged below the Discharge Cut-off Voltage
- When the battery is damaged
- When the battery was overcharged

If in doubt, contact the manufacturer, Mastervolt: www.mastervolt.com.

⚠ WARNING

Never open the connector lid on top of the battery. Doing so may cause damage to the printed circuit board.

⚠ CAUTION

Due to the mounting position of the auxiliary batteries, they may be subject to damage due to road hazards or other travel-related issues.

Regularly inspect the batteries for damage. Be extremely cautious of leaking batteries and loose or damaged electrical connections.

Do not use the 12 volt battery system if any battery damage is detected and until proper repairs are performed.

NOTICE

The voltage range (12.0-14.6V or 24.0-29.2V is larger than you may expect from other battery types, such as lead-acid batteries. Be aware that these voltage could exceed the permitted voltages of the connected electrical devices (load(s)).

NOTICE

The components of the Re(li)able Battery Power System are designed and manufactured with high quality materials and components, which can be recycled and reused. Follow local safe disposal practices—never dispose battery system components with normal household waste. Always dispose components through an authorized waste management facility.

Lithium-ion battery power systems are available as either standard or optional equipment on select TMC Class B motorhomes. When installed, this power system replaces the traditional on-board generator, converter, and AGM batteries; providing a clean and reliable off-the-grid energy source for all 12 volt DC and 120 volt AC (through an upgraded inverter/charger) electrical devices of the motorhome.

The lithium-ion battery pack delivers twice the power at 1/3rd the volume and 1/6th the weight as compared to standard lead acid batteries. The battery packs are designed for long life, outlasting traditional batteries by up to 5 times.

The system consists of these major components:

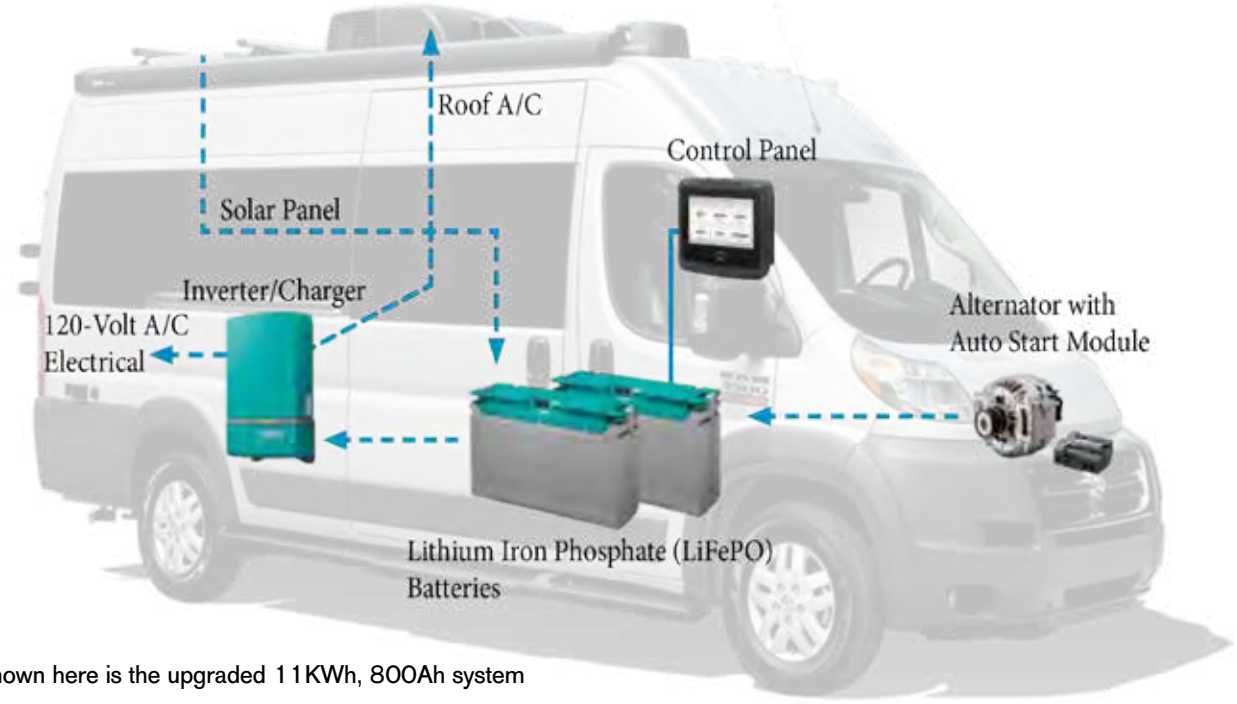
- Lithium Iron Phosphate ($LiFePO_4$) battery pack(s)
- Inverter/Charger
- System Control Panel
- High-output Alternator
- Auto-start Charging Module (select systems only)

Beginning mid-Model Year 2022, there are three Re(li)able battery power systems available, depending on the Class B model and designated standards and options:

- Standard on select models: A 2,560 Watt-hour (Wh), 200 Amp-hour (Ah) lithium battery system (2-100 Ah $LiFePO_4$ batteries) with a 3,000 watt inverter/charger and 170 amp charging alternator.
- Standard and optional on select models: A 5,500 Wh, 400 Ah, single lithium battery pack, including a 3,000 watt inverter/charger, and 280 amp charging alternator.
- Optional upgrade from the 400 Ah system: An 11,000 Wh, 800 Ah dual-lithium battery pack, including a 3,000 watt inverter/charger, 280 amp charging alternator, and auto-start charging system (auto-start charging not available with Sprinter-based motorhomes).

Safety Guidelines:

- Read all manufacturer's instructions and manuals before using any li-ion battery power system. Keep the manufacturer's manual in a handy place for future reference.
- Follow all manufacturer's instructions and safe operating procedures for the Re(li)able Battery Power System.
- Work and maintenance on the li-ion battery should be carried out by qualified technicians only.
- Non-compliance with operating instructions, repairs made with other than original parts, or repairs made without authorization renders the warranty void.



Shown here is the upgraded 11KWh, 800Ah system

- Always install a safety relay, which disconnects the battery under abnormal circumstances.
- Installation and commissioning of the battery requires programming of events in a MasterBus network. The installer must be familiar with the programming of such events.
- Connections and safety features must be executed according to the locally applicable regulations.
- Use cables and wires of appropriate size (gauge).
- Never use the Re(Li)able Battery system in situations where there is danger of gas or dust explosion or potentially flammable products.
- Protect the battery terminal connectors from moisture and dust. Do not obstruct the ventilation openings.
- Protect the inverter/charger from moisture and water intrusion.
- Switch off all charging systems and disconnect the batteries from the electrical system during maintenance and/or repair activities.

200 Amp-Hour (Ah) System Operation

SHORE POWER:

When shore power is available, 120 volt AC electrical devices are powered by the external AC source. Incoming AC is passed through the system's inverter/charger, via an internal transfer switch; then out to an on-board fuse/breaker panel, which in turn, the electrical devices of the motorhome are connected. DC powered devices, such as internal lights, awnings, and device charging stations are powered by the system's 12 volt batteries. Electrical power for battery charging is provided by the incoming AC power source.

If the AC load demand is high, the circuits in the inverter/charger automatically reduce the power going to charge the batteries, therefore making more amperage available for the motorhome's AC powered devices (up to the full amperage of the incoming source).

If the AC load is still above the potential of the incoming AC source, the inverter/charger will automatically augment the AC supply by providing additional AC power from the system's batteries via the inverter.

NOTE: the AC load of the motorhome should never exceed 40 amps. Exceeding 40 amps could damage the inverter/charger.

Load Sheading

Due to the high AC load when the microwave oven and the air conditioning unit are being used, a load sheading circuit is employed which temporarily cuts power to the air conditioning unit while the microwave oven is in use. Power is automatically restored to the air conditioner two minutes after the microwave oven is off.

NOTE: Load sheading is active whether power is being drawn from an external source (shore power) or from the on-board batteries.

OFF-THE-GRID POWER

When shore power is not available, power for both the AC and DC electrical devices of the motorhome is supplied by the on-board lithium batteries. DC power is supplied directly by the 12 volt batteries and AC power is supplied through the inverter, which draws its power from the 12 volt system batteries.

While operating the electrical devices of the motorhome strictly by the battery power system, being mindful of electrical loads and power demands becomes very important. Load sheading, as described previously, is employed whenever the microwave oven is turned on; automatically cutting power to the air conditioning unit. However, due to the limited availability of power from the on-board batteries (200Ah maximum from fully-charged batteries), one should always be conservative with power use whenever shore power is not available.

NOTE: When operating off-the-grid, always take advantage of the on-board solar charger, which uses solar power to replace battery power consumption.

System Monitoring

The 200Ah battery power system includes two devices that provide power monitoring:

- **MasterVolt Smart Remote:** monitors incoming and outgoing power from the inverter/charger.
- **Balmar SG200 Battery Monitor;** monitors the charge and discharge condition of the on-board batteries.

Operating the MasterVolt Smart Remote monitor:

- Pressing P1 (first button on left) turns the inverter ON/OFF
- Pressing P2 or P3 reveals sub menus, where adjustments to power sharing and other parameters are made.
- The readout shows the following conditions:

MasterVolt SmartRemote Inverter Monitor and Remote Controller

Inverter State of Operation: Inverting/Charging/Standby

Battery Voltage or Charging Current

Output Power (AC OUT)

Shore Power (AC IN)

Energy Left in Battery (State of Charge)

Time Remaining During Discharge

Display Icons and Meaning

Operating the Balmar SG200 Battery Monitor:
The battery monitor has three main data display areas, as shown below.

Top Bar: This shows the currently selected device.

Display Area: This is where data and menus are shown.

Bottom Bar: This is where context-sensitive navigation options are shown

Balmar SG200 Battery Monitor

Single Button Operation:
The SG200 has a single button for ease of operation. A button press can be:

1. **Short Press**
2. **Long Press** (release as soon as screen flashes)
3. **Extra-Long Press** (about three seconds until checker-board pattern shows: performs a network reset)

Short presses take you from one item on the screen to another. For instance, if the screen is showing Voltage, a single short press will change the screen to show Current in amperes.

A long press is used to make a selection or enable the editing of a value. As soon as you see flashing on the screen, you have made a long press and cab release your finger.

NOTE: The battery monitor is a smart device, meaning that it must experience a cycle of full-charge to full-discharge of the batteries so that the unit can properly display the battery condition. Refer to the manufacturers instructions included in your Owners Packet or available through your on-line Owners Resource document service.

8

400 Ah System Operation

SHORE POWER

When shore power is available, the transfer switch (built into the inverter/charger) detects power from the external source and automatically selects this power source. 120 volt AC electrical devices are powered by this external AC source, through the on-board circuit breaker/fuse box. DC power is supplied by the on-board lithium battery pack. A portion of the incoming AC power is used to charge the lithium battery pack.

If the AC load demand is high, the circuits in the inverter/charger automatically reduce the power going to charge the batteries, therefore making more amperage available for the motorhome's AC powered devices (up to the full amperage of the incoming source).

If the AC load is still above the potential of the incoming AC source, the inverter/charger will automatically augment the AC supply by providing additional AC power from the system's batteries via the inverter.

NOTE: the AC load of the motorhome should never exceed 40 amps. Exceeding 40 amps could damage the inverter/charger.

OFF-THE-GRID POWER

When shore power is not available or not detected by the transfer switch, the on-board lithium battery system provides the power for all 120 volt AC and 12 volt DC devices. 12 volt DC-powered devices are powered directly by the on-board battery pack, while the 120 volt AC devices (mainly the microwave oven, air conditioner, TV, and other entertainment devices) are powered by the 3000 watt inverter, which converts 12 volt DC battery power to 120 volts AC.

While operating the electrical devices of the motorhome strictly by the battery power system, being mindful of electrical loads and power demands becomes very important. Due to the limited availability of power from the on-board battery (400Ah maximum from fully-charged battery pack), one should always be conservative with power use whenever shore power is not available.

NOTE: When operating off-the-grid, always take advantage of the on-board solar charger, which uses solar power to replace battery power consumption.

The system has a user-interface control panel; mounted near the sliding door entrance of the motorhome (location may vary depending on model).

1. Remove the protective cover to access the control screen.
2. Locate and hold the home button. After a few moments, the control panel screen will turn ON, displaying the system's monitoring screen.

System Control Panel

3. To turn OFF the control panel, hold the home button for approximately 3 seconds; an option screen will appear. Select Lock, Stand by, or Off.

Home button on System Control Panel

Illustration of Lock, Standby, and Off control features

SCREEN NAVIGATION

Navigate to another page by swiping or by tapping the left or right bottom of the screen. The bullets on the bottom of the display show how many pages are in the menu selection and which page of the sequence is being displayed.

Swiping and tapping to change screen views

Soft buttons located along the top of the touch-screen allow navigation to other menu screens.

Refer to the manufacturer's instructions regarding system configuration, operation, and fault codes displayed by the control panel.

Li-ion System Safety Relays

⚠ WARNING

If a non-resettable BATTERY SAFETY event occurs; set the safety relay(s) to LOCK OFF and contact a service representative for assistance. Refer to the manufacturer's instruction manual for further information.

IF THE SAFETY RELAY HAS BEEN TRIGGERED:

1. **On the MasterBus control panel, check that the voltage is within limits; between 10V and 15.5V or 20V and 31V.**
2. **If within limits, click the CLOSE RELAY button on the MasterBus control panel. Start charging if voltage is Low or discharging when high.**
3. **If Relay trips again, Isolate battery and contact a manufacturer's (Mastervolt) representative.**

Attached to the underside of the vehicle (location varies due to floor plan design) are two safety relays, one for each battery pack (see illustration below).

In order to draw power from the battery packs AND provide charging to the Li-ion battery system, the safety relays must be in the ON position and latched. As these safety relays also act as a power disconnect for the battery packs, place the safety relays in the OFF position whenever servicing the Li-ion system is required or when taking the Li-ion system out of service (such as placing the vehicle in storage).

Safety Relays for the Li-ion Battery System

Safety Relays in the OFF position

Safety Relay rotated to the ON position. Depress the center to engage the safety relay

Safety Relay engaged, turning ON the battery pack

NOTE: There is a safety relay for each lithium battery pack. 400Ah systems will have one safety relay (one battery pack), while 800Ah systems will have 2 safety relays (2 battery packs).

TURNING THE SAFETY RELAYS ON:

1. Rotate both yellow switch knobs to the left (ON position).
2. Depress the center of the knob to engage the safety relay (powering the battery system).

TURNING THE SAFETY RELAYS OFF:

Rotate the yellow knob to the right (OFF position). The center of the knob should automatically pop-out.

RESETTING A TRIPPED SAFETY RELAY:

If the battery system has shut-off and the safety relay(s) are tripped:

1. Turn OFF all 120 volt appliances (air conditioner, appliances, etc.) and disconnect appliances from the 120 VAC receptacles.
2. Press the center of the yellow knob to re-set the safety relay. If the safety relay does not latch, do not force it. The Li-ion battery system will need repairs.

NOTE: If you do not have power and the safety relays are NOT tripped, check the battery charge condition on the Mastervolt control panel. It is likely the battery packs need re-charging.

Battery Safety Event

A battery safety event triggers the safety relay to automatically disconnect the battery from the loads and charging devices. There are two kinds of battery safety events: a resettable and a non-resettable.

A resettable safety event occurs if one of the following conditions is met for 10 seconds:

- The battery voltage is less than 10.0V (12V battery) or 20.0V (24V battery);
- The battery voltage is more than 15.5V (12V battery) or 31.0V (24V battery);
- The voltage of one of the individual cells inside the Li-Ion battery is too high or too low (2.5V / 4V •for 10 sec or 2V / 4.2V for 1 sec);
- The internal temperature of one of the individual cells is too high (>85°C).
- This event is repeated every 60 seconds. It will only stop repeating if:

  The battery voltage returns and remains within specifications, i.e. 10.0-15.5V (12V battery) or 20.0-31.0V (24V battery).

A non-resettable safety event occurs if one of the following conditions is met for 10 seconds:

- The battery voltage is less than 9.0V (12V battery) or 18.0V (24Volt battery);
- The battery voltage is more than 16.0V (12V battery) or 32.0V (24Volt battery);
- The voltage of one of the individual cells inside the Li-Ion battery is too high or too low (5V / 1.5V •for 1 sec);
- The internal temperature of one of the individual cells is too high (>90°C).

Battery Charging

When the vehicle's engine is running, battery charging is accomplished with the vehicle's secondary high-output alternator, which is designed to charge the battery pack within a few hours of driving. When parked, charging is accomplished whenever shore power is connected (by the system's inverter/charger). The inverter/charger automatically keeps the battery(ies) in a state of charge by sensing and regulating the charging needs of the battery pack.

Illustration of Mastervolt control panel in the battery monitor mode

Battery charging is augmented by the on-board solar panel and solar charge controller. Solar charging is available whenever the solar controller is ON, independent of the system's inverter/charger or vehicle's alternator.

Stop Charge Event

When the battery gets too close to the allowed operating specifications, the Stop Charge event forces the MasterVolt charger to switch to the float stage, in which a lower charge voltage is used (or switch off in case of parallel connection). The event will be active for 10 minutes.

Refer to the manufacturer's information provided in your Owner's Packet, for safety, operational, charging, and maintenance details. System information is also available through the TMC Owners Resource:

800 Ah System Operation

The 800 Ah battery system's operation is the same as the 400Ah system, except for the addition of a second battery pack and a second safety relay. Both systems use the same MasterVolt controller described in the previous section.

Your familiarity and use of the system and the electrical devices of your motorhome will be the best gauge of how long your battery power system will last before requiring a recharge. Using the on-board solar charger whenever possible will add power back to the batteries, prolonging system use.

NOTE: The electrical load of an air conditioner can be significant. When not connected to shore power, turn off the AC while away from your motorhome for an extended period of time. This will significantly prolong battery life between charges.

Battery Charging While the Vehicle is in Motion

Whenever the vehicle's engine is operating, battery charging for all lithium battery systems is being accomplished by the addition of a high-output alternator, specifically designed to charge the lithium batteries while the vehicle is in motion. Charging energy is regulated by the inverter/charger so that excessive battery heat and potential over-charging is prevented. Select lithium power systems use the vehicle's engine and this additional alternator as an auto-charging system, described in the following section.

Auto-Charging Via the Vehicle's Engine

(Not available on Sprinter-based motorhomes)

⚠ WARNING

If you are in a parked motorhome with the vehicle's engine running, there is a potential for exhaust fumes entering the motorhome.

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

Before engaging the auto-start charging system, ensure the vehicle is parked in an open area and that the vehicle's exhaust system is free of obstructions.

Do not engage auto-start charging if the vehicle is parked in an enclosed building or confined space.

Test the CO/LP detector and ensure it is operational.

The system includes an auto-start module (not available with Sprinter-based Class B motorhomes) that when enabled, monitors the Li-ion battery's state-of-charge. When the state-of-charge falls below a pre-programmed set-point, the module will auto-start the vehicle's engine, providing charging to the battery pack(s). While engine is running the module continues to monitor the battery's state-of-charge, and when it reaches a pre-programmed level; the module will auto-stop the engine.

Auto-Start Control Button, located left of the steering wheel

Enabling the Auto-Start Module

MONITOR MODE:

For the Auto-Start Module to control engine start/stop, it must first be in 'Monitor Mode.' Before entering Monitor Mode, these pre-conditions must be met:

- Vehicle is in park
- Vehicle's driving brakes are NOT engaged
- Parking brake engaged
- Hood closed
- Fuel level above 1/4 tank
- Ignition switch in the RUN position

With these pre-conditions met, Monitor Mode is entered by pressing and holding the control button (located along the left side of the dash) for a pre-programmed amount of time. The control button LED turns ON as a visual indication. As long as Monitor Mode is active, the LED remains ON. The key can be removed from the ignition after entering Monitor Mode.

Upon entering Monitor Mode the instrument cluster will turn ON, a 30-second timer will start, and the Auto-Start Module will monitor the Li-ion battery's state-of-charge. If battery state-of-charge remains above the 'trip-point,' and the 30-second timer expires, the system will turn OFF the instrument cluster and continue to monitor the battery state-of-charge. Once the battery state-of-charge drops below the 'trip-point,' the system will turn ON the instrument cluster and auto-start the vehicle's engine (on high-idle) as normal.

The vehicle's engine will run until the Li-ion battery reaches 80% charge.

MONITOR LED

A continuously-lit LED indicates normal monitoring operation. If the LED is blinking, either an error has occurred or an unwanted operational condition has been detected. Three possible errors are:

- Engine failed to start after 3 tries
- Engine failed to stop after 3 tries
- Engine prematurely stopped

For each of these circumstances, auto-start/stop function is disabled until Monitor Mode is reset (exiting, then re-entering). A forth case which temporarily disables auto-start/stop is if the vehicle's brakes are applied while in Monitor Mode. In this instance, auto-start/stop is again disabled for a period of time before automatically returning to normal Monitor Mode operation.

EXITING MONITOR MODE

Exiting Monitor Mode is accomplished either by:

1. Releasing the parking brake, or;
2. Pressing the FOB 'Unlock' button 3 times.

For these two actions:

   a. If the engine is running, the module will turn OFF the engine, then exit Monitor Mode (indicated by the LED turning OFF).

   b. If the engine is not running, Monitor Mode is simply exited (indicated by the LED turning OFF).

3. Insert the key in the ignition and turn it to the CRANK position.

   a. If the engine is running, the module exits Monitor Mode (indicated by the LED turning OFF).

   b. If the engine is not running, the module exits Monitor Mode without starting the engine (indicated by the LED turning OFF).

NOTE: Once Monitor Mode is exited, the Auto-Start Module is disabled. Monitor Mode must be re-entered in order to enable the Auto-Start Module.

BATTERY FORCE CHARGING

While in Monitor Mode, an additional feature allows the user to activate the engine on high-idle, enabling faster charging of the batteries. If the module is in Monitor Mode:

1. Press the activate/deactivate button three times within 3 seconds; at which time the vehicle's engine will start and run on high idle speed.
2. The engine will continue to run on high idle until the Li-ion battery system is fully charged and then auto-shut off the vehicle's engine as normal.

NOTE: Consult the manufacturer's instructions for full details regarding the safety and operational details of the auto-start/stop charging system. Manufacturer's information is available through TMC's on-line Owners Resource:

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

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120 Volt Power System

Power for the 120 volt AC electrical devices installed in your motorhome is supplied by:

- The on-board generator
- Shore power
- The inverter

The standard inverter is not designed to power the entire 120 volt system and when used, care must be exercised so that overloading the inverter is avoided. However, the inverter supplied with the optional Re(li)able Battery Power System is capable of powering all 120 volt appliances.

Shore Power

⚠ DANGER

CONNECTING THE SHORE CORD TO A NON-GROUNDED OR IMPROPERLY GROUNDED POWER SOURCE CAN RESULT IN DANGEROUS AND POSSIBLY FATAL ELECTRIC SHOCK.

Due to the potential danger in failing to heed this warning, the motorhome manufacturer cannot be responsible should damage, injury, or death result from failure to connect the power cord to a properly grounded power source.

⚠ 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 or other 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 equipment damage, personal injury or death.

⚠ 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.

Make sure the circuit 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.**
- **Do not use cheater plugs, adapters, or extension cords 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.**

⚠ CAUTION

- **It is strongly advisable to test the wiring of any external power source BEFORE connecting your motorhome. Along with a proper ground, the 120 volt AC source must have properly wired neutral and hot terminals.**
- **Testing for correct power source wiring can be easily accomplished with a portable polarity tester, obtained from a RV parts supplier or dealer. Follow the instructions provided by the manufacturer when operating the tester.**
- **If a problem with the external power source is found, CONTACT THE CAMPSITE MANAGER for repairs. Do not attempt repairs to the site power source and do not connect your motorhome to the site power source until it is determined safe to do so.**

Typical Camp–ground electrical service stand. This illustration shows 50 amp, 30 amp, and 15-20 amp outlets, along with corresponding circuit breakers.

⚠ 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.

A Warning Label, similar to the one shown here, is affixed on your motorhome, near the 30 amp shore line cord inlet.

30 Amp, 120 Volt Shore Line Power Cord

⚠ WARNING

MOTORHOMES THAT ARE FACTORY-EQUIPPED WITH A 30 AMP ELECTRICAL SERVICE SHOULD NEVER BE CONNECTED TO A POWER SOURCE THAT WILL PROVIDE MORE THAN 120 VOLTS AC.

Although the 3-prong, 30 amp RV connectors look similar to 240 volt AC connectors found in residential homes (electrical dryers, stoves, etc.), the 30 amp RV power service is designed for 120 volts AC only.

Failure to follow this power requirement will result in serious damage to appliances and electrical devices.

Your Class B motorhome is designed for 30 amp electrical service, a 30 amp shore line power cord is provided to attach the motorhome to a grounded 110-125 volt AC, 30 amp external power source.

NEVER CONNECT YOUR SHORE POWER CORD TO AN ELECTRICAL SOURCE THAT SUPPLIES MORE THAN 120 VOLTS AC.

Always turn OFF the main power switch or circuit breaker of the shore power electrical outlet before connecting or disconnecting the shore line power cord. This will eliminate arcing of electrical contacts and reduce the potential of electrical shock. Please strictly follow all electrical-related safety labels affixed to your motorhome.

NOTE: Connect the pronged (or male) end to the shore power cord to the external electrical service, and the socket (or female) end to the motorhome's electrical connection port.

Connecting to an External Power Source

Inquire with the campsite owner or manager if they provide the electrical service your motorhome requires. It is always advisable to ensure the external electrical source is properly wired and grounded before connecting your motorhome. If the external electrical source is confirmed to be appropriate for your motorhome's electrical system, follow this electrical hook-up procedure:

1. Locate the load center inside your motorhome and turn OFF the main AC circuit breakers. Some panels will have two main circuit breakers.
2. Carefully extend the entire length of the shore line power cord (approximately 35 feet) from the electric cable port on the motorhome to the external power source.
3. Ensure the circuit breaker(s) at the external power source are OFF.
4. Connect the shore power cord to the receptacle on the motorhome. If the connector has a locking ring, carefully engage the threads until snug. Some connector designs may require a slight twist after insertion.

Typical shore line power cord connection port

5. Plug the shore line power cord into either the 30 amp or 50 amp external power receptacle, matching the power requirements and power cord connector of your motorhome. Be sure all the connector prongs are properly and completely inserted into the power source receptacle.
6. Turn ON the circuit breaker at the external power source.
7. Turn ON the main circuit breaker(s) at the motorhome's load center.

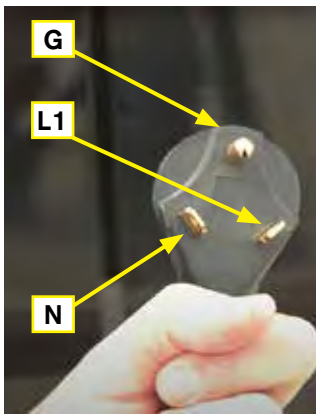
NOTE: Always turn OFF the air conditioner, furnace, and all electrical appliances before connecting and disconnecting the shore power cord from the 120 volt AC power source and/or before operating or turning off the generator.

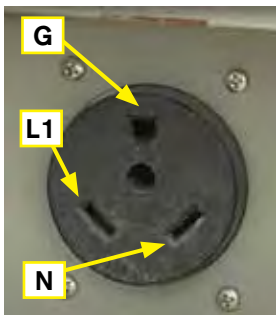
When you are ready to leave the campsite, reverse the shore line power cord connection process. Use care to prevent damaging the electrical connection pins when connecting or disconnecting the shore line power cord. Grasp the plug to remove the shore line power cord from the outlet; do not unplug it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

Shore Power Wiring Configuration

For safe electrical power for your motorhome's electrical system, it is important that the external power source is correctly wired. If the shore power source is incorrectly wired, it is possible that the chassis frame and metal objects could become energized. It is also extremely important that the shore power source is properly grounded, thus protecting from the physical hazards of electrical shock.

Below are illustrations of the proper wiring for the 50 amp and 30 amp shore power cords and their corresponding power receptacles. Please talk to the campground's maintenance personnel if you have any questions or concerns regarding the wiring of the campground's electrical hook-ups.





G = Ground L1 = Leg 1 (120 VAC measured to neutral or ground)
N = Neutral

Standard 3-prong, 120 volt, 30 amp RV shore power plug and receptacle wiring configuration

Shore Line Cord Plug Adapters

⚠ WARNING

USE EXTREME CAUTION WHENEVER ADAPTING SHORE POWER CORDS TO A UN-MATCHED (CURRENT) ELECTRICAL SERVICE.

- **30 AMPERAGE SHORE POWER CORD TO A 15-20 AMPERAGE SERVICE**

THE SIGNIFICANTLY REDUCED AMOUNT OF AVAILABLE INCOMING POWER COULD DAMAGE ELECTRICAL MOTORS, COMPRESSORS, AND OTHER DEVICES.

⚠ WARNING

NEVER ADAPT A 30 AMP SHORE POWER CORD TO A 50 AMP EXTERNAL POWER SERVICE.

SEVERE ELECTRICAL OVERLOAD TO THE SHORE POWER CORD AND/OR THE MOTORHOME'S ELECTRICAL SYSTEM COMPONENTS COULD CAUSE ELECTRICAL FIRES OR OTHER DAMAGE.

⚠ CAUTION

REDUCE POWER LOADS WHENEVER ADAPTING A LARGER AMPERAGE SHORE POWER CORD TO A SMALLER SHORE POWER SOURCE.

DO NOT USE POWER-CONSUMING ITEMS, SUCH AS AIR CONDITIONERS, MICROWAVE OVENS, ETC.

Plug adapters are available to connect your 3-prong, 30 amp shore power cord to a 3-prong, 15-20 amp standard household electrical receptacle.

Only do so as a **TEMPORARY** means of supplying limited electrical power to your motorhome. Do not use high-demand electrical devices, such as air conditioners and microwave ovens. Electrical overloads can easily happen and could cause damage to the electrical devices of your motorhome.

Shore power cord adapter

USING A 120 VOLT, 15-20 AMP POWER ADAPTER

Use 120 volt, 15-10 amp adapters only for extremely limited use, such as powering a few internal lights, powering a refrigerator, or providing charging energy for your auxiliary batteries when the motorhome is in storage.

Power cord adapters are available in several styles and configurations. Only use adapters when absolutely necessary and on a temporary basis. Always be aware that the use of adapters restricts power to the motorhome.

NOTE: In limited shore power situations such as described here, when possible, it is a better solution to use the motorhome's generator to supply electrical power.

Trickle Charging Batteries During Storage

The shore power cord and the motorhome's converter can be used to keep the auxiliary batteries charged during storage.

1. Use a plug adapter to convert the shore power plug to a standard, 3-prong household outlet.
2. At the motorhome's circuit breaker panel, turn ON the Main Circuit breaker(s) and the Converter circuit breaker. Turn OFF all other circuit breakers.
3. Plug in the shore power cord to the household outlet.
4. Turn ON the master battery disconnect switch.
5. Ensure all interior lights and 12 volt devices are OFF or disconnected from the power source.

Transfer Switch Protection

Beginning with model year 2022, TMC motorhomes are equipped with transfer switches that provide reverse polarity and open neutral protection. If there is a fault with the shore power source or generator power, a fault warning message will be displayed on the multiplex main panel screen and power will not be passed through the transfer switch to the motorhome (see Transfer Switch section).

If a ground or reverse polarity fault is detected, the shore power source or generator must be repaired by a qualified technician or electrician.

Shore Power Cord Maintenance

Inspect the shore line power cord for damaged contact pins, cuts, cracks, and worn insulation; replace damaged shore power cords immediately.

NOTE: Travel with a circuit tester or a digital multimeter in your tool bag. This will allow testing shore power service and help diagnose power-related issues.

Generator

⚠ DANGER

OPERATING THE GENERATOR CREATES EXHAUST GASES THAT CONTAIN CARBON MONOXIDE. CARBON MONOXIDE IS POISONOUS AND CAN CAUSE UNCONSCIOUSNESS AND DEATH.

- **THE GENERATOR PRODUCES DANGEROUS FUMES WHEN IT IS RUNNING. SEVERE PERSONAL INJURY, DEATH, AND EQUIPMENT DAMAGE CAN RESULT FROM OPERATING THE GENERATOR IN A GARAGE, BUILDING, OR A CONFINED SPACE. WHENEVER THE MOTORHOME IS PARKED OR STORED IN A GARAGE OR CONFINED SPACE, DISABLE THE AGS SYSTEM TO PREVENT THE GENERATOR FROM AUTOMATICALLY OPERATING.**
- **TO AVOID EXHAUST GAS ENTRY INTO THE MOTORHOME, KEEP WINDOWS CLOSED WHEN THE CHASSIS OR GENERATOR ENGINES ARE RUNNING.**

⚠ DANGER

- **Test the CO/LP detector installed in your motorhome frequently to ensure protection from carbon monoxide and/or LP gas leaks. If an alarm sounds, immediately shut off the generator and all gas and electric appliances and evacuate the motorhome. Turn off the main battery disconnect switch and main gas valve at the LP tank. Seek medical assistance if necessary. Have all necessary repairs to equipment made by a qualified technician before continuing use.**
- **Disable the AGS system when sleeping in the motorhome. The potential of carbon monoxide poisoning is present when the generator is operating and the alarm may not awake you to the hazard.**
- **When parked, be sure that the generator's exhaust is clear of any obstructions, such as underbrush, rocks, and snow. Follow all generator safety guidelines provided by TMC in your owner's manual and the instruction manual provided by the generator's manufacturer.**

⚠ CAUTION

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.

NOTICE

Your motorhome's generator may be equipped with features that prevent operation if certain maintenance parameters are not met, i.e., low engine oil level, clogged air and fuel filters, etc.

If your generator fails to start or shuts off unexpectedly, and there is an adequate fuel supply and 12 volts DC present, it may need maintenance attention. Refer to the manufacturer's owner's manual for troubleshooting and maintenance procedures.

Safe Generator Operation

IMPORTANT: 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 on-board generator allows your motorhome to be electrically self-contained. It provides 120 volts AC when shore power is not available (via the automatic transfer switch) and indirectly provides 12 volt DC energy through the converter.

Generator operating controls are integrated into the main multiplex panel. Review and follow all operational and safety precautions provided by the generator's manufacturer, written on warning labels and provided in the manufacturer's owner's manual, which is included in your Owner's Packet.

1. DO NOT operate the generator while sleeping or allow others to sleep in the motorhome while the generator is operating. You would not be aware of exhaust gases entering the motorhome, or be alert to symptoms of carbon monoxide poisoning.
2. DO NOT operate the generator in an enclosed building or in a partly enclosed area such as a garage or storage unit.
3. DO NOT operate the generator when the motorhome is parked in high grass or brush. Heat from the exhaust could ignite dry vegetation.
4. DO NOT operate the generator longer than necessary when the vehicle is parked. This will help to reduce exhaust gases near the motorhome.
5. DO NOT simultaneously operate generator and a ventilator fan, which could result in the entry of exhaust gas. When ventilator fans are used, open a window on the opposite side of the motorhome and 'upwind' of generator's exhaust pipe, to provide cross ventilation.
6. DO NOT open nearby windows, ventilators, or doors into the passenger compartment, particularly those which can be 'down wind,' even or short periods of time. When parked, orient the vehicle so that the prevailing winds will carry the exhaust away from the motorhome.
7. 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.
8. 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.
9. DO NOT use the generator if the exhaust system is damaged. Before using the generator, inspect the exhaust system. Test the carbon monoxide alarm every time you use the motorhome. If the CO alarm sounds, immediately move everyone to fresh air and ventilate the motorhome. Shut the generator OFF, and do not operate it until it has been inspected and repaired by a qualified technician.

OPERATING TIPS:

- The main battery switch must be ON to start and operate the generator.
- Control switches for operating the generator are incorporated in the multiplex touch-screen panel.
- 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 and/or before shutting OFF the generator.
- The generator operates on gasoline drawn from the vehicle's fuel tank. In some installations, fuel will not reach the generator if the level of the vehicle's fuel tank drops to a certain level (usually 1/4 tank).

NOTE: Generators supplied with diesel-powered Class B motorhomes are fueled by propane gas. When operating the generator, observe all propane-related safety precautions.

Starting and Stopping Procedures

Your generator can be started and stopped from the main multiplex control panel, integral control panel on the generator, or from the multiplex system's remote phone app. Outlined here are the simple steps for starting and stopping the generator:

- Before starting the generator, turn OFF air conditioners and large electrical loads.
- Before starting in cold weather, turn OFF all appliances for best long-term performance.

TO START:

1. Locate the Generator ON/OFF switch, on the Monitor Panel or integrated into the Multiplex Control Panel.
2. Prime the engine by holding the OFF position of the start/

stop switch for a few seconds. The LED on the switch will turn on.

3. After priming, press and hold the ON position until you hear the generator start. The LED will flash during starting, then remain on when the generator is running.
   a. The engine will turn over and should start within a few seconds.
   b. If the engine fails to start within a few seconds, do not over-crank.
4. Before turning ON appliances, let the generator warm up for a few minutes. Generally, a beep from an appliance indicates that the generator is supplying electricity.
5. Under normal operating conditions, you may detect the engine of the generator increase and decrease in RPM (run faster and slower). This is normal, due to changes in electrical power demand.

TO STOP:

1. Turn off air conditioners and large electrical loads and allow the generator to run for 3-5 minutes before stopping, to allow the generator to cool down.
2. Press and hold the OFF switch position until the generator stops. The indicator LED on the switch will turn off.

NOTES:

- To prevent generator overload due to initial start-up current demand, turn ON air conditioners and appliances in a sequential order and only after the generator is started and runs for a few minutes.
- If you lose power to the motorhome while operating the generator, check the overload circuit breaker on the generator; it may have tripped due to too much power demand. Turn off some appliances or electrical devices in order to reduce the total power demand.
- If your generator fails to start or remain running, and there is an adequate fuel supply and 12 volts DC present, it may need maintenance attention. Refer to the manufacturer's owner's manual for troubleshooting and maintenance procedures.
- Turn OFF all appliances before resetting a tripped circuit breaker. If the breaker trips again with all electrical loads off, turn OFF the generator and contact a qualified technician for repairs.
- If your motorhome is supplied with an AGS system, refer to your motorhome's Owner's Packet for details regarding its features, set-up programming, and operation.
- If your motorhome has a multiplex wiring system, settings for the automatic generator start system are incorporated in the Settings Menu of the multiplex system.
- For complete generator instructions, refer to the manufacturer's guidelines included in your Owner's Packet, or available through your TMC Owners Resource account, or available from the manufacturer's website.

Automatic Generator Start (AGS)

⚠ DANGER

Disable the AGS system when sleeping in the motorhome or when the motorhome is parked in a garage or confined space. The potential of carbon monoxide poisoning is present when the generator is operating.

Your motorhome may be equipped with an Automatic Generator Start (AGS) system. An AGS can be a stand-alone system, part of the generator's control circuitry, or part of the inverter's control system. The purpose of an AGS system is to automatically start (and run) the generator when certain programmed parameters are encountered:

- When the auxiliary battery(ies) voltage drops to a predetermined level, the AGS circuitry will sense the low voltage condition and start the generator, which, in turn, supplies charging voltage to the batteries through the inverter/charger. Once the system batteries have regained a sufficient amount of charge, the AGS will automatically turn off the generator.
- When there is a power demand from air conditioners, some models may feature a thermostat interface, where if the temperature of the coach rises to a programmed level, the generator will start, allowing the air conditioner to operate. The AGS will automatically turn off the generator after the air conditioner turns off.
- Some units are time-programmable, enabling the user to determine when the generator will operate. This feature is useful if the campground has restrictions regarding running generators during certain time periods of the night.
- Motorhomes equipped with a 12 volt DC compressor-type refrigerator are typically outfitted with a stand-alone AGS. When turned ON, the AGS will automatically start the generator when the auxiliary battery(ies) drop to a programmed voltage level, therefore, keeping the refrigerator operational.

When the auxiliary battery(ies) have reached a state of full-charge, the AGS will automatically turn OFF the generator.

Refer to the manufacturer's instructions for complete AGS operating and safety information. Copies are included in your Owners Packet or on-line through the TMC Owners Resource document service.

Generator Access

⚠ CAUTION

Due to the mounting position of the generator, ground clearance of the motorhome is restricted. Always be mindful of road hazards, curbs, speed bumps, and other road-related issues that could impact and damage the generator.

If damaged, do not operate the generator until all repairs are properly performed.

The generator is located underneath the vehicle, secured by mounting brackets. The vehicle must be raised to access the generator for service or maintenance. Always secure a raised vehicle with jack stands.

Refer to the vehicle manufacturer's owner's manual for proper jacking procedures.

Automatic Transfer Switch

⚠ WARNING

The transfer switch provides protection from reverse polarity and ground faults due to faulty shore power source and generator wiring.

DO NOT DEFEAT THESE PROTECTIVE FEATURES. SEVERE DAMAGE TO THE ELECTRICAL SYSTEM, INCLUDING ELECTRICAL SHOCK COULD OCCUR.

The Automatic Transfer Switch is an electronically controlled relay that senses the presence of 120 volts AC incoming power; either from shore power or from the on-board generator. It automatically switches between these two incoming power sources, connecting the active incoming power source to the Power Load Center, thereby powering the motorhome's electrical system.

When 120 volts AC is not present, the Automatic Transfer Switch connects the auxiliary battery to the coach 12 volt system. If an inverter is installed, limited 120 volts AC is available for a restricted number of circuits and appliances.

THE AUTOMATIC TRANSFER SWITCH OPERATES UNDER THESE CONDITIONS:

- When shore power is sensed, it connects the external AC power source to the Power Load Center.
- If there is a shore power outage and the generator is started, either manually or by the Automatic Generator Start System (AGS), incoming power is switched from the shore power source to the generator after a 20-45 second delay.
- If shore power returns while the generator power is present, the system remains on generated power until the generator is turned off. With the generator off, electrical power for the motorhome is switched to the shore power source.
- The generator overrides shore power.
- If 120 volts AC is not present, check the circuit breakers at the shore power source and/or the output of the generator.

TRANSFER SWITCH PROTECTION

Beginning with model year 2022, TMC motorhomes are equipped with transfer switches that provide reverse polarity and open neutral protection. If there is a fault with the shore power source, a fault warning message will be displayed on the multiplex main panel screen. Power will not be passed through the transfer switch to the motorhome until the fault is corrected.

IF A FAULT MESSAGE IS DISPLAYED:

1. Contact the park maintenance personnel to check the wiring of the shore power source. **DO NOT ATTEMPT TO REPAIR A FAULTY SHORE POWER SOURCE. LEAVE IT TO A PROFESSIONAL ELECTRICIAN.**
2. If 120 volts AC is NOT present while attempting to power your motorhome with the on-board generator, check the circuit breakers on the generator.
   - Turn OFF air conditioner and other electrical appliances.
   - Reset circuit breakers if needed.
   - Re-start the generator and after 30 seconds, turn ON electrical appliances. If power is not restored, have a qualified service technician look into possible problems with the generator or transfer switch.

NOTE: All TMC Class B motorhomes are equipped with a transfer switch rated for 30 amp service. Do not attempt to connect to a higher amperage power source.

Power Load Center: 30 Amp

⚠ DANGER

- **Do not force a tripped circuit breaker into resetting. A tripped circuit breaker indicates a problem with the circuit that must be corrected.**
- **Never bypass or defeat circuit breakers or circuit fuses.**
- **Do not replace circuit breakers with one of a higher current rating.**
- **Do not replace blown fuses with a fuse of a higher current rating.**

Circuit damage could result, creating the potential of electrical shock, electrocution, and fire.

⚠ WARNING

A qualified RV electrician should perform any repairs to the electrical system of your motorhome. If misused, electrical energy is dangerous and can cause fires, electrical shock, or electrocution.

The All-in-One Power Load Center of your motorhome provides electrical control for both 120 volt AC and 12 volt DC circuits. This unit consists of three main components:

- 120 volt AC Circuit Breaker Panel
- 12 volt DC Fuse Panel
- Converter

Power Load Center

The Power Load Center is usually located in the rear bed pedestal or a rear closet, but may be located elsewhere within the motorhome. Each circuit of the main power panel is labeled according to the device(s) connected to it.

120 Volt Circuit Breaker Panel

⚠ WARNING

Replacement circuit breakers must be of the same voltage, amperage rating, and type. Never use a higher rated replacement circuit breaker than what was originally installed with your motorhome. Doing so may cause a fire by overheating the motorhome's wiring.

The 120 volt AC section of the Power Load Center contains toggle-type circuit breakers. Circuit breakers protect the 120 volt wiring and components in your motorhome from circuit overloads and shorted circuits. Should a circuit overload or short circuit occur, the circuit breaker protecting the affected circuit will 'trip,' preventing the flow of electricity to that circuit.

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

If a circuit breaker trips, turn OFF and unplug the electrical appliance(s) or devices 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, then plug-in the electrical devices and try operating them. If the circuit breaker re-trips or frequently trips, unplug the appliances(s) on the circuit and contact your selling dealer's service department to have the electrical problem diagnosed and repaired. It is possible that the appliance is faulty, not the circuit.

If the circuit breaker refuses to re-set, this indicates there is something wrong with that circuit. DO NOT ATTEMPT TO FORCE THE CIRCUIT BREAKER TO THE ON POSITION:

- The circuit may be overloaded with too many devices.
- The device may draw more current that what the circuit is designed to supply.
- The device may have developed an internal short circuit.
- The circuit wiring or outlet (receptacle) may be damaged.

Do Not attempt to use that circuit or device until the problem is determined and repaired by a qualified electrician.

NOTES:

- Circuit breakers and fuses are vital in keeping the electrical system of your motorhome in a safe operational condition. Never bypass or defeat circuit breakers or circuit fuses.
- Some electrical appliances may have their own circuit breakers. If there is an interruption in electrical service of an appliance, consult the manual for that appliance to determine the recommended action to take.
- For motorhomes equipped with a multiplex wiring system, the power load center and associated circuit breaker/fuse panels is quite different than the power load center described in this section.

For information regarding multiplex wiring systems, please contact your selling dealer or a TMC Customer Care representative.

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.

12 Volt Fuse Panel

⚠ 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's wiring.

ATC Blade-Style Fuse

The circuits that receive power from the 12 volt DC section of the Power Load Center are protected by automotive blade-type (ATC) fuses. The 12 volts DC fuse panel label indicates fuse sizes, positions, and the electrical components powered by the 12 volt circuits. To determine if a fuse has BLOWN (unable to pass electricity), it must be pulled from its socket and visually inspected. A blown fuse will have a distinct, open gap in the wire or conductor between the fuse blades.

Only replace blown fuses with fuses of the same size and current rating of the fuse that was originally supplied in the fuse socket. Each socket is labeled with the correct current rating. Replacing any fuse with a higher current rated fuse will create an unsafe condition, possibly causing circuit damage and a fire.

A blown fuse indicates a problem with the circuit that is associated with the fuse. You must determine the cause and take corrective actions whenever a fuse is blown. Possible causes of blown fuses are:

- Too many devices attached to the circuit, causing circuit overload.
- The circuit may be overloaded by a device that demands more energy than what the circuit is designed to deliver.
- A short-circuited or defective device attached to the circuit.
- A short-circuited wire or outlet associated with the circuit.

Before replacing a fuse always shut OFF the engine, generator, and all motorhome electrical systems completely. Make 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 equipped).
4. Turn the inverter OFF (if equipped).
5. Turn OFF the Master Battery Disconnect Switch.
6. Remove the fuse panel cover.
7. Turn OFF the electrical device identified on the fuse label.
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.
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. Additionally, lower-rated fuses will likely blow, for they will not allow adequate current to the device(s) on that circuit.

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 needed. Please contact your selling dealer's service department for further repair assistance.

Take corrective action to repair any defective electrical circuit or device. If help is needed, seek assistance or repairs from a qualified RV electrician or technician.

NOTE: Blade-type fuses come in several sizes; mini, standard and large. The fuse sockets of the Power Load Center only accept standard ATC-size blade type fuses.

Keep a supply of properly rated blade-type fuses on hand in case a fuse needs to be replaced. Replacement fuses can be obtained at auto parts stores or auto repair facilities.

Converter

The power converter is a 12 volt power supply, which provides 12 volts DC from incoming 120 volts AC, either supplied from an external shore power source or the on-board generator. The converter also provides charging energy for the auxiliary battery(ies). The converter is typically housed within the power load center of 30 Ampere electrical systems, but it can be a stand-alone unit in some applications.

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

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.

CONVERTER OPERATION MODES:

Most converters are automatic three-stage switching power supplies. The converter senses which mode it needs to be in by sensing the demands of the motorhome's power demand.

- **Absorption mode/Normal operation:** During this mode, the converter output is in the 13.6 volts, DC range. This is the normal operation mode. This mode provides the 12 volts DC and current required by the 12 volt lighting, appliances, and devices; well as slow charging the auxiliary battery(ies).
- **Bulk mode/Charge mode:** In this mode, the output voltage of the converter will switch to 14.4 volts DC range for a maximum of four hours. This mode provides extra energy for faster auxiliary battery charging. If the converter cycles between 'Absorption and Bulk mode', there could be a shorted battery cell or other issues.
- **Float mode/Trickle charge:** In this mode, the converter is charging the battery with a trickle voltage of 13.2 volts DC. When the converter senses a demand (by turning on lights or other 12 volt devices), the converter automatically returns to the 'Absorption mode.'

NOTE: The master battery disconnect switch must be ON for charging energy from the converter to connect to the auxiliary batteries.

USING THE CONVERTER

NOTICE

If the converter is not operating correctly, the reverse polarity protection fuse may be blown (located on the converter front panel). Check the connections on the coach battery for proper polarity and correct if necessary. If a fuse requires replacement, only replace with one of the same type and rating.

Under normal operating conditions, the converter requires no user attention or maintenance. However, if the coach batteries happen to become reverse connected, fuses that protect the converter from cross-polarization may blow. If your converter is not operating, check the polarity of the coach battery connections and correct if necessary. If the fuses on the front panel of the converter have blown, replace with the same type and amperage rating. If the incoming AC voltages are normal, but the converter output is still not delivering 12 volts DC, the converter requires repair. Contact the manufacturer for service details.

Due to the high level of electrical energy it supplies, the converter may be warm to the touch when operational, and this is normal. It does, however, have built-in thermal protection; if it gets too hot, it will turn itself off. After it cools down, the converter will return to normal operation. In most cases, this thermal cycling is caused by some object being placed in too close of proximity to the converter, preventing it from receiving adequate ventilation. Make sure not to place anything near the converter that could obstruct ventilation.

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.

GFCI Receptacle

⚠ WARNING

If the GFCI fails EITHER the self-test or manual test, turn OFF power to the failed circuit at the Power Load Center. Do not restore power to the faulty circuit until proper repairs have been made.

Your motorhome is furnished with ground fault circuit interruption (GFCI) protection on specific 120 volt AC receptacles (recepts). GFCI recepts are found in the bath, while recepts in the kitchen area and exterior may be electrically connected to this circuit; therefore, also GFCI protected.

The GFCI does not protect against short circuits or electrical overloads. Circuit breakers in the Power Load Center, which supply power to the circuit, will trip if these conditions exist.

GFCI recepts are compliant to the self-test industry standards implemented in 2015. These new GFCI's automatically monitor the presence of ground, and if a ground fault is present, whether a load is plugged in or not, the GFCI shuts off power to the recept. Although the self-testing feature increases the safety of the recept, it does not eliminate the need for occasional manual testing of the GFCI circuit breaker to ensure it is working properly. Manually test GFCIs at the beginning of the travel season and monthly thereafter.

TO TEST THE GFCI CIRCUIT BREAKER:

1. Make sure power is switched ON to the circuit. Use a test meter, test probe or a low-wattage electrical device.
2. PUSH the test button. The RESET button should pop out.
3. With the RESET button out, all power should be interrupted (OFF) to the recept being tested.
4. Verify there is no voltage to the recept by using the test probe or low-wattage electrical device.
5. Push the RESET button IN to restore power to the GFCI.
6. Verify that voltage has been restored to the GFCI recept.

If the reset button does not pop out after pushing the test button, or GFCI circuit breaker continues to trip, or if the power is not interrupted to the test light, immediately turn OFF power at the main circuit breaker panel and have a qualified electrician repair the circuit or replace the GFCI. Do not use that circuit until repairs are made.

If a non-GFCI recept is 'dead', check the near-by GFCI circuit breaker; it may need to be reset. If so, unplug all electrical devices from the GFCI recept and all recepts wired to this circuit, and reset it. Then, monitor it for proper circuit functionality.

If resetting the GFCI does not restore power to it and to the other GFCI-protected recepts ***and*** the corresponding circuit breaker in the Power Load Center is ***not*** tripped, then there is a problem with the electrical circuit or GFCI recept. Enlist the service of a qualified electrical technician for repairs. Do not use that circuit until repairs are made.

NOTE: It is normal RV wiring practice to wire one or more electrical receptacles to the GFCI circuit. If another outlet in the motorhome is 'dead' check the GFCI in the bathroom; it may be tripped.

Outside 120 Volt AC Receptacle

⚠ WARNING

NEVER USE AN APPLIANCE OR ELECTRICAL DEVICE THAT IS NOT PROPERLY GROUNDED OR HAS A MISSING OR DEFEATED GROUND PIN. INJURY OR DEATH DUE TO ELECTROCUTION IS POSSIBLE.

Your motorhome is equipped with a convenient outside 120 volt AC power receptacle that is useful for operating appliances and entertainment devices. For your safety, the outside receptacle is grounded and ground-fault protected (Ground Fault Circuit Interruption, or GCFI).

POWERING THE OUTSIDE RECEPTACLE:

The outside 120 volt AC power receptacle is energized whenever the motorhome is connected to shore power or the on-board generator is running. In typical RV wiring fashion, this receptacle is wired to a circuit that is ground-fault protected and likely includes other receptacles; usually located in the bathroom and kitchen; areas where the likely-hood of water is present. Refer to your motorhome's 120 volt wiring diagram to locate other receptacles on the GFCI circuit.

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Propane System

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

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

NEVER TRAVEL WITH, AND/OR STORE PROPANE (LP) CONTAINERS OR CYLINDERS INSIDE YOUR MOTORHOME.

Propane cylinders are designed to vent whenever internal pressures reach a certain threshold. Therefore, the potential of a venting propane cylinder presents a gas leak hazard, which, if ignited, could lead to an EXPLOSION, FIRE, AND SERIOUS BODILY INJURY OR DEATH.

⚠ WARNING

ALL PROPANE GAS IS CONTAINED UNDER PRESSURE. DUE TO THE DANGEROUS POTENTIAL OF ANY COMPRESSED GAS, IT IS MANDATORY THAT THE FOLLOWING REQUIREMENTS FOR THE USE OF THIS TANK BE FOLLOWED:

Tanks are to be installed, fueled, and maintained in accordance with the state and local codes, rules, regulations, or laws and in accordance with the NFPA Pamphlet 58, division IV.

⚠ WARNING

ROAD VIBRATION CAN LOOSEN PROPANE FITTINGS. It is important to check the Propane System for leaks at least every 5,000 miles, and whenever the tank is filled. It is also recommended to have the entire Propane System checked annually by a qualified propane service technician.

⚠ 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.**

⚠ CAUTION

Several main propane system components are installed underneath the vehicle. Due to their location, these components may be subjected to damage caused by road hazards or other travel-related circumstances.

⚠ CAUTION

Regularly inspect the propane system for possible damage and do not use the propane system until all damage is properly repaired.

Introduction

Propane or liquefied petroleum (LP) gas is a clean and efficient source of energy that provides fuel for cooking, heating, hot water, and generating electricity (by a propane-fueled generator, if equipped). Propane is also used as an energy source for refrigeration (evaporative-type RV refrigerators).

Propane is a colorless and odorless gas that, when under pressure, is in a liquefied state. An odorant (usually a sulfur compound) is added as a detection agent. If you smell propane within or around your motorhome, or hear the propane alarm (LP/CO alarm), quickly and carefully perform the procedures listed on the safety alerts at the beginning of this section, listed

in Section 3, Vehicle Safety, and safety labels affixed to your motorhome.

Strictly adhere to all propane safety warnings and operational guidelines printed on propane appliances, devices, and included in propane appliance manufacturer's operational manuals.

Always be mindful that propane gas can be hazardous if used improperly. Propane is heavier than air, and if leaking, the gas tends to flow and accumulate in low areas, such as the floor. Ensure the combination LP/CO detector is properly maintained and operational. Observe and follow proper handling and safety precautions when using propane gas and propane appliances.

The propane system installed in your motorhome is comprised of numerous components such as the propane tank, main gas valve (solenoid-actuated), gas hoses, propane gas regulator, gas piping, gas appliances, and copper (or steel) tubing lines and valves within each gas appliance.

As part of your normal maintenance routine (at least once a year), have a qualified propane service technician perform an inspection of your entire propane system, including a system pressure test (appliances, tank, regulator, hoses, piping, and fittings).

Traveling With Propane

⚠ DANGER

Turn OFF all pilot lights, appliances, and their igniters (see operating instructions) while the motorhome is traveling or in motion, and before refueling the motorhome's 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.

As with all on-board fuel (diesel, gasoline, or other), traveling with propane does present a level of risk, yet risks can be minimized by following a few basic travel precautions.

- Some states prohibit propane appliances to be operated during travel, especially in underground tunnels, across bridges, or on a ferry. While traveling, you may also encounter local restrictions against transporting flammable materials (other than the fuel for the motorhome's engine). Make sure you are familiar with the transportation laws for the areas where you will be traveling, by checking before hand with the state's or province's Department of Transportation (DOT) or similar regulatory office.
- Never travel or stow auxiliary propane gas cylinders inside the motorhome or inside a non-vented storage compartment. All ASME certified propane gas tanks and cylinders have a safety pressure relief system that is designed to vent propane gas to the atmosphere if a certain internal pressure threshold is reached. A hazardous condition exists if gas venting is contained within the motorhome or an enclosed storage compartment.
- Over time, road vibrations can cause gas fittings and connections to loosen. Make it part of your routine motorhome inspection to check all gas fittings, valves, and connections, for looseness and possible gas leaks.
- Keep your LP/CO detector in good working order and test it at the beginning of your travel season and least once a week while traveling.
- Be sure your traveling companions know what to do if propane gas is detected, either by smell or by the sounding of the LP/CO alarm. **TAKE IMMEDIATE SAFETY ACTIONS WHENEVER GAS IS DETECTED.** Review and practice evacuation procedures.
- Operating a gas appliance(s) while traveling presents the risk of fire and/or explosion if the vehicle encounters some type of road hazard or vehicle damage. To reduce risk, always travel with gas appliances OFF and the propane system main valve OFF.
- **EXTINGUISH ALL PILOT LIGHTS AND OPEN FLAMES, AND TURN OFF APPLIANCES WITH ELECTRONIC IGNITERS BEFORE ENTERING A FUELING STATION AND DURING FUELING FOR EITHER VEHICLE FUEL OR PROPANE GAS.**

Propane Tank

⚠ DANGER

Always shut OFF the motorhome's engine while refueling propane tank. Do not smoke. Turn off all appliances with automatic igniters and do not operate other ignition sources while refueling.

⚠ DANGER

Over-filling the propane gas tank can result in uncontrolled gas flow which can cause fire or explosion. A properly filled tank will contain approximately 80% of its volume as liquid propane.

An 80% automatic shut-off valve is installed on the propane gas tank which will automatically prevent further filling when the gas volume has reached 80% of tank capacity.

⚠ 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.

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

⚠ WARNING

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

⚠ CAUTION

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

⚠ CAUTION

Never use another LP tank other that the one furnished with the motorhome. If the LP tank must be replaced, check with your dealer for correct LP tank specifications and replacement procedures.

NOTICE

New propane containers are filled with an inert gas, which must be carefully purged before filling with propane. The propane tank must NEVER BE OVERFILLED with propane (more than 80% by volume).

NOTICE

Hand tighten 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.

A permanently mounted A.S.M.E. (American Society of Mechanical Engineers) approved propane container (tank) is mounted under the floor of your motorhome. A fill port with a main LP gas shut-off switch is located on the LP access panel, positioned along the lower left side of the vehicle. Propane expands 1½ percent for every ten degrees Fahrenheit of increase in temperature. When filling, it is imperative to leave sufficient space inside the container to allow for natural expansion of gas during warmer weather.

Monitoring Propane Levels

The amount of propane contained in the propane tank can be monitored by pressing the appropriate monitor buttons on the motorhome's main multiplex system panel. Refer to Electrical System Section.

Filling and Servicing the Propane Tank

Given that the propane tank is not removable, the motorhome will need to be driven to a qualified propane facility for filling and servicing. Only an authorized propane service technician(s) should be near the motorhome while the propane tank is being filled. Drivers and passengers should wait at a safe distance away from the motorhome until LP filling and servicing is complete.

NEVER OVERFILL THE PROPANE TANK!

Never allow your propane tank to be filled above the maximum safe level as indicated by the fixed liquid level gauge (if equipped). Overfilling the propane container above the liquid capacity indicated on the gauge could allow liquid propane to enter the system that is designed for vapor only, creating a hazardous condition.

NOTES:

- The capacity or size of a propane tank is expressed in pounds (lbs.) and correlates to the weight of the propane it is capable of containing when filled to 80% capacity, not the total volume capacity of the tank.
- For example: If your motorhome has a 40 pound capacity LP Tank, filling it to 80% = 32 pounds of LP. LP weighs 4.2 lbs/gallon, so the 80% capacity of a 40 pound LP tank is 7.6 gallons (32÷4.2).

Using the Propane System

⚠ 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.

IF YOUR MOTORHOME HAS A PRIVACY CURTAIN WITHIN 6 FEET OF THE GAS COOKTOP; do not operate unless the privacy curtain is secured away from the appliance or removed.

Do not store combustible materials on or near gas appliances.

May cause a fire, which could result in death or serious injury.

NOTICE

Some appliances, such as furnaces, water heaters and refrigerators, are equipped with automatic propane igniters, while some stove or oven models may require lighting a pilot light before operating the appliance.

MAKE SURE THAT YOU READ AND FULLY UNDERSTAND ALL SAFETY REQUIREMENTS FOR HANDLING AND OPERATION OF ALL GAS APPLIANCES AND DEVICES OF THE PROPANE SYSTEM.

Main Gas Valve

NOTICE

To operate the main gas valve solenoid, 12 volt DC power must be present by turning ON the master battery switch. When 12 volt DC power from the auxiliary battery is OFF or unavailable, the gas valve is in-operable and remains CLOSED. However, if battery power is restored and the main propane gas valve switch was left in the ON position, the main gas valve solenoid will OPEN.

Propane access panel, positioned along the lower left side of the vehicle

The main propane gas valve installed on this vehicle is controlled by an electrical solenoid. The actuation switch for the gas valve is located on the propane access panel, positioned along the lower left side of the vehicle. This panel also contains the propane tank fill port and a propane tank bleeder valve.

TURNING ON THE PROPANE GAS

1. Ensure the master battery disconnect switch is ON.
2. Ensure ALL burner valves, controls, and pilot light valves are closed.
3. Turn ON the main gas valve switch. When the red light on the switch illuminates, it indicates that the main gas valve is OPEN.
4. Listen carefully as propane begins to flow. If a hissing noise is heard for more than one or two seconds, **THERE MAY BE A GAS LEAK!** Turn OFF the main gas valve switch and contact your selling dealer's service department to have the propane system tested.
5. Operate the gas appliance(s) and devices as needed, following the appliance manufacturer's instructions.

TURNING OFF THE PROPANE GAS

1. CLOSE and turn OFF all burner valves, controls, and pilot lights to all gas appliances and devices.
2. Turn OFF the main gas valve switch. The red light on the switch will extinguish, indicating the gas valve is CLOSED.

NOTES:

- The main propane valve installed on this vehicle is controlled by a rocker switch, controlling a gas-valve solenoid. It has a built-in red light that when illuminated, indicates the main gas valve is OPEN. To close the gas-valve, turn OFF the gas valve switch (red light extinguishes).
- The main propane valve solenoid is only powered by the auxiliary battery (12 volts DC). It is NOT powered through shore power or the generator (via the converter). The Main Battery Disconnect switch must be ON in order to use of the propane system.

Furnace/Water Heater Gas Shut-off Valve

Several TMC Class B motorhome models are equipped with a Truma furnace/water heater combo (see Interior Section). The main heating unit is equipped with a gas shut-off valve, which is electrically controlled by a switch that is located on the main unit. The switch (Fig. 1) shuts off the power to the safety gas shut-off valve and therefore, the gas supply to the Combi furnace. Under normal operations, this switch can be left ON because operating the furnace and water heating control is done on a separate control panel.

Use this gas valve shut-off whenever maintenance to the unit is required, or when storing the vehicle for an extended period. To make sure that the gas supply to the furnace is off, turn the switch to the OFF position. If the furnace/water heater is not producing hot water or hot air, check the position of this switch; it must be in the ON position for the unit to operate properly.

NOTE: This switch does not affect gas supply to other gas appliances within the motorhome, nor does it affect the main gas valve switch of the motorhome.

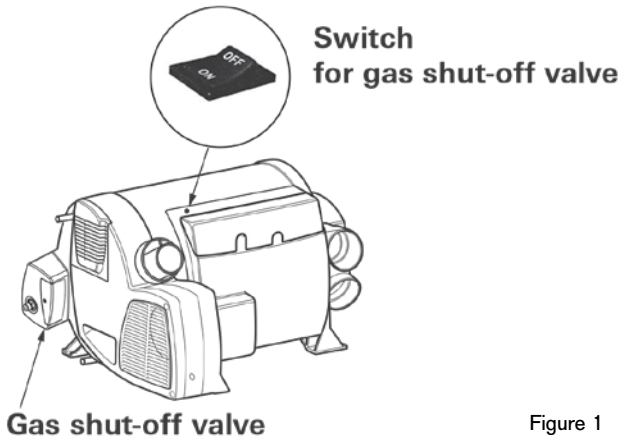

Figure 1

External Propane Hook-up

⚠ DANGER

Only operate external LP gas appliances for their intended purpose. Follow all safety and operational instructions associated with the appliance. The risk of fire, explosion or severe bodily injury exists.

Propane available at this source is at normal and regulated operating pressure. Never bypass or defeat the gas regulator installed on the motorhome's propane system.

⚠ 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.

⚠ WARNING

The Auxiliary Propane Gas Hook-up is equipped with a manual LP gas shut-off valve, located near the quick-disconnect coupler. Always turn OFF this gas valve when this LP source is not in use.

As with the main gas valve, ensure this valve is in the OFF position when traveling.

⚠ CAUTION

Ensure that children and pets stay well away from any gas appliance in use or connected to the external propane hook-up.

Do not use or operate appliances designed for outdoor use inside the motorhome.

Potential injuries due to trips, falls, flame and heat exist whenever an external gas hose, along with a gas appliance is in use.

External propane hook-up

Your motorhome may be equipped with an external propane quick connect/quick disconnect. This low-pressure gas source is a convenient propane connection for an external gas appliance, such as a gas grill, fryer, or other gas device.

This external propane hook-up has its own manual gas shut-off valve, located directly behind the quick disconnect port. To operate the Propane Hook-up:

1. Ensure the manual shut-off valve is OFF.
2. Confirm your gas appliance is fitted with a proper gas hose and mating connector, and if so, connect it to the propane quick-release port.
3. Turn ON the main gas valve.
4. Slowly open the manual shut-off valve, listening to ensure there are no gas leaks. **IF A GAS LEAK IS DETECTED, IMMEDIATELY CLOSE THE SHUT-OFF VALVE. AND DETERMINE AND REPAIR THE SOURCE OF THE LEAK.**
5. When safe to do so, operate the gas appliance.
6. After using the gas appliance, turn OFF the manual shut-off valve.

ENSURE THIS GAS VALVE IS OFF WHENEVER TRAVELING, RE-FUELING, AND WHEN THE EXTERNAL PROPANE HOOK-UP IS NOT IN USE.

Always follow the gas appliance manufacturer's instructions for safe operation of all gas devices.

NOTE: Some gas appliances may have built-in gas regulators that could make the device incompatible with this low-pressure propane source.

Propane Leak Test

⚠ WARNING

If a propane gas leak is detected, close all gas valves and turn off all igniters.

Do not use any part or component of the propane system until the leak is properly repaired by a qualified technician.

Propane leaks may be found easily with a soapy water solution. Do not use a solution containing ammonia or chlorine. These chemicals 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 pipe 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) at the propane tank, and immediately contact a your selling dealer's service department or qualified propane service representative to arrange repairs.

Water System

Fresh Water System

Potable (drinking) water is supplied throughout your motorhome from either the fresh water holding tank or from a connection to an outside water source. When using the fresh water holding tank, water is pressurized and travels through the water lines by means of the water pump. When utilizing an external water source, such as a campsite water spigot, the water pump is not needed (it is bypassed by check valves), as the campsite water source provides pressurized water to the motorhome.

Potable Water Hose

To supply safe potable water to your motorhome, purchase and keep separate a sanitized water hose, whose sole function is for use with your potable water delivery and storage. Use a different water hose for other water-related activities, such as cleaning outdoor furniture, washing the motorhome, maintenance, or sewer system cleanup.

Filters may be purchased and installed in-line with the hose to provide filtered water to the motorhome.

Connecting to an External Water Source

⚠ CAUTION

Some external water sources develop high water pressure, particularly in mountainous regions. These campgrounds or hook-up locations may not have regulated water pressure, which could be considered excessive.

High water pressure is anything over 55 psi. Excessive pressure may cause leaks or damage to your motorhome's water system.

NOTICE

When connected to an external water source, it is strongly recommended that a water pressure regulator is used in-line with the water supply delivery hose. Water pressure regulators are designed to reduce high external water supply pressures to a level that is safe for your motorhome's water system; preventing potential damage. RV water pressure regulators can be obtained at RV suppliers or dealers.

When an external fresh water source is available, connecting to it will help conserve the water supply on board, while eliminating the need to use your on-board water pump (water pressure is provided by the external source).

1. Set your water heater bypass valves (if installed) to the correct position listed on your water system label. **DO NOT OPERATE THE WATER HEATER IF ITS WATER SUPPLY IS BYPASSED.**
2. Remove the cap from the fresh water inlet, located on the left side of the motorhome. The city water hook-up is the top port. The lower port is the fresh water tank fill.
3. Attach one end of your potable (drinking) water hose to the external water source spigot.
4. Connect the other end of the hose to the motorhome's city water inlet.

City water fill connection, along with a storage chamber for the sewer hose. This image for reference only. The water ports on Class B motorhomes vary in type and location due to floor plans and features.

5. Turn ON the external water source spigot. 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.

NOTE: The use of in-line water filters and pressure regulators (not supplied by TMC) is recommended whenever potable water is being delivered by an external source. Ask your dealer for details.

Disconnecting From an External Water Source

1. Turn OFF the external water source spigot valve.
2. Disconnect your potable water hose from the supply spigot and the fresh water inlet of the motorhome.
3. Remove the water hose and store it in an appropriate place.
4. Reinstall the cap on the fresh water inlet.

NOTE: If you will be away from your motorhome for a few hours or more, it is a good practice to disconnect or turn off the spigot valve from the city water source. This will prevent or reduce any damage that could be caused by a pressure-induced leak in the motorhome's water system pipes or fittings.

Filling the Fresh Water Tank

⚠ WARNING

THE ON-BOARD FRESH WATER TANK IS FOR POTABLE WATER ONLY. Sanitize, flush, and drain fresh water tank before using.

Failure to maintain tank may result in death or serious injury.

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 on-board fresh water holding tank.

1. Set your water heater bypass valves (if installed) to the correct position listed on your water system label. **DO NOT OPERATE THE WATER HEATER IF ITS WATER SUPPLY IS BYPASSED.**
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 cap on the Fresh Water Tank Fill port.
4. Attach a potable water hose to the fresh water tank inlet, while attaching the other end of the hose to a source of safe drinking water. Turn ON the valve at the water source. Only use a water hose designated for potable water purposes.
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. Disconnect and stow your water hose;
   c. Replace the cap on the fresh water tank fill port.

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. Then, gradually open the hot and cold water faucets to clear air from the lines. Close the faucets when the water is flowing freely.

NOTE: When traveling, it is a good practice only to carry a quantity of fresh water that will meet your needs until arriving at your next destination.

This will reduce the total weight carried by motorhome, allowing for carrying capacity for other items, if needed. Refer to Section 5, Occupant and Cargo Carrying Capacity (OCCC).

Gravity Fill Port

Located on the outside of your motorhome is a gravity fill port for the fresh water tank. This feature is used when there is not a potable water hose or safe pressurized water source available for filling the fresh water tank.

1. The gravity fresh fill port for the fresh water tank is usually located on the left side of the motorhome, near the rear (Figure 1).
2. Open the port access door with the supplied key (Figure 2) and remove the cap (Figure 3).
3. Pour FRESH WATER ONLY into the port. Replace the cap and close the access door.

Figure 1

The style of the gravity fill port may differ from these illustrations.

Figure 2

Figure 3

Water Pump

NOTICE

- **Do not turn the water pump ON if the fresh water tank is empty. Doing so could cause damage to the water pump.**
- **Do not turn the water pump ON when using water from an external source. Only operate the water pump if using potable water stored in your fresh water tank.**
- **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.**

The water pump is used to draw fresh water from the fresh water tank whenever the motorhome is not connected to city water (e.g., campsite water). To operate the water pump, 12 volts DC power must be available (turn ON the main battery switch).

Once turned ON at the monitor or multiplex or panel, the water pump (also known as an on-demand pump) will self-prime, pressurize the water lines, and provide water to the faucets, shower, and toilet. As long as the water pump switch is ON, and there is water in the fresh water holding tank, the pump will automatically cycle on and off as water demand requires.

OPERATING THE WATER PUMP

The water pump is designed to operate automatically on an as-needed basis. Using the water pump continuously, such as leaving a faucet open for an excessive time period, or operating the water pump without water in the fresh water holding tank, will shorten its operational life and is not covered by warranty. The water pump has a check valve that prevents water from back-flowing out the city water fill.

DO NOT OPERATE THE WATER PUMP IF THE FRESH WATER HOLDING TANK IS EMPTY OR THE MOTORHOME IS CONNECTED TO AN EXTERNAL WATER SOURCE.

1. Make sure there is adequate supply of water in the fresh water holding tank.
2. Be sure the water heater bypass valves are set correctly according to your water system label. **DO NOT OPERATE THE WATER HEATER IF ITS WATER SUPPLY IS BYPASSED.**
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 heater tank (if installed). 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.
5. The water pump switch must be ON to provide water to the toilet.

The switch for the water pump is usually located on the Monitor Panel or Multiplex Main Panel (if equipped). Refer to Electrical System Section. Some installations provide a water pump switch on the bathroom wall or other convenient locations.

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

Water Pump Strainer

If equipped, periodically check the in-line water pump strainer for accumulated debris. The strainer is usually located on the inlet to the water pump. To clean the water pump strainer shut OFF the water pump, unscrew the clear cap, remove the reusable strainer cartridge, clear any debris, rinse with clean water, and reinstall the strainer and cap.

Fresh Water Filter

Your motorhome may be equipped with a cartridge-type fresh water filter. Periodically, the filter cartridge will need to be replaced. Also, when sanitizing or winterizing the water system, be sure to follow the guidelines specified for the water filter. Water system diagrams are included as part of the schematic set for your motorhome, available through your TMC Owners Resource account.

Rear Convenience Panel

Located inside the rear door of some floor plans is a convenience panel and storage area. Included on this panel:

Convenience panel

- 120 volt AC receptacle
- 12 volt DC receptacle
- Water pump switch
- Convenience light switch
- Quick disconnect water hose with spray nozzle

The storage area provides a convenient place to stow the shore power cord and the coiled water hose, along with ample room for the potable fresh water hose.

Low Point Drain Valves

Low point drain valves are used to drain the fresh water system whenever maintenance, sanitizing, or winterizing is required. The valves are installed in at the lowest point of the water system, thus providing a complete system evacuation. The valves allow draining the hot and cold water lines and the fresh water tank.

The low-point drain valves are located along the lower left side of the motorhome (location varies depending on floor plan and features).

Furnace/Water Heater Combo

⚠ WARNING

CARBON-MONOXIDE POISONING HAZARD!

Failure to follow instructions could result in severe personal injury or death due to carbon-monoxide poisoning if combustion gases enter the RV.

Check that all openings in the outside wall around the vent (and air intake) pipe(s) are sealed to prevent combustion gases entering the RV.

Check that furnace vent and air intake are not obstructed in any way.

Never operate the combination furnace/water heater in an enclosed or confined space.

This combination furnace/water heater presents danger of hot surfaces and hot gases. Do not touch the area around the wall cowl and do not lean any objects against the wall cowl (furnace exhaust).

Your motorhome is equipped with a factory-installed LP-fired combination furnace/water heater, designed specifically for recreational vehicles (also described in the Interior Section of this manual).

The furnace/water heater combination unit has an internal tank that holds a volume of 2.6 gallons of water. Some models use a combination of LP gas and electric to rapidly heat water and provide warm air. Some Class B installations include a separate wall-mounted controller for the furnace/water heater, while others may integrate operational functions within the multiplex system.

Set the desired hot water temperature on the furnace/water heater controller. The temperature at the hot water faucets will not exceed this setting.

For complete safety information and operational instructions on the particular furnace/water heater unit installed in your motorhome, please refer to the water heater manufacturer's guide contained in your Owner's Packet or visit the water heater manufacturer's website. Product information is also available in the TMC Water System Guide and TMC Class B Supplement, available from the on-line TMC Owners Resource document service.

NOTE: Never operate the combination furnace/water heater without having an adequate supply of pressurized fresh water available for the boiler unit.

When using the bath facilities, be conscientious of the limited volume of hot water and waste water collection capacities of your motorhome.

Bathroom and Bath Fixtures (if equipped)

Rear Bathroom

Your motorhome is well appointed with a compact, but complete bathroom. Depending on floor plan, features include:

- Toilet
- Shower and shower curtain
- Sink
- Vanity with mirror
- Privacy door

The on-board water pump must be ON (along with fresh water in the fresh water tank), **or** the motorhome must be connected to an external pressurized potable water source in order to use the bathroom fixtures.

BATHROOM SINK OPERATION:

1. Turn ON the water pump or connect your motorhome to an external pressurized potable water source.
2. Flip down the sink bowl and rotate the faucet over the bowl.
3. Turn on the valves and proceed with washing.
4. Return the faucet and bowl to their stowed position.

SHOWER OPERATION:

1. Ensure you have an adequate on-board supply of fresh water or are connected to an external potable water source.
2. Turn ON the combination furnace/water heater and set the desired hot water temperature. The water heater is a quick-recovery tank-type. However, it will need approximately 20 minutes to pre-heat the water. Follow the manufacturer's instructions included in your TMC Owner's Packet.
3. Adjust the water temperature to your preference.
4. Turn ON the water pump, if not connected to city water.
5. Turn on the ceiling vent (if installed). Doing so will help reduce moisture within the motorhome.
6. Always use the shower curtain. Doing so will help reduce moisture and water damage to cabinets and other devices.
7. Turn on the water valve and using the shower wand, proceed with washing. Stow the shower wand when finished washing.

TOILET OPERATION:

1. Turn ON the on-board water pump or connect the water system to an external pressurized source.
2. Fill the toilet bowl by stepping partially down and holding the fill/flush pedal until the bowl is about 1/2 full.
3. To flush: press the fill/flush pedal completely down until the bowl empties.
4. Monitor the black waste tank levels and empty when full.

NOTE: Be careful to not allow the black waste tank to become overfilled, resulting in an unsanitary spill-over.

Some bathroom doors provide a second set of door latches, which allows for extra room when in the shower (as illustrated here).

Cassette Toilet (if equipped)

NOTICE

Only use toilet manufacturers recommended toilet paper, cleaning, and maintenance supplies with the cassette toilet.

Follow all manufacturer's instructions associated with the cassette toilet; including preparation, use, waste disposal, cleaning, maintenance, cold weather use, and storage.

Detailed instructions for the casssete toilet and other water-system devices are provided in your Owner's Packet or avaialble througt TMC's on-line Owners Resource document service.

Some Class B motorhome floor plans have a bath which contains a cassette toilet. When a cassette toilet is installed, the motorhome will not have a black water holding tank. However, the motorhome will have a gray waste water tank which collects waste water from the bath sink, shower, and kitchen sink.

Unitized bath with cassette toilet

PREPARING THE CASSETTE TOILET FOR USE

The cassette toilet requires special attention in order to maintain safe and efficient use. Before using the toilet and after emptying the waste cassette, the waste cassette must be properly prepared. Doing so will ensure sewage waste does not clog the waste cassette:

1. Remove the waste cassette through the service door (see emptying the waste cassette).
2. Place the waste cassette upright and turn the spout upwards and remove the cap.
3. Add the proper amount of manufacturer's treatment chemicals to the cassette. Do not add treatment chemicals through the toilet bowl; these chemicals can damage seals.
4. Add approximately 3 liters of water to the cassette.
5. Replace the cap, turn the spout to its stowed position, and return the waste cassette to its stowage bay.

USING THE CASSETTE TOILET

1. Turn ON the on-board water pump or connect the water system to an external pressurized source.
2. The toilet bowl can be rotated for user comfort. Close the toilet cover, grasp the toilet bowl with both hands and rotate to the desired position.
3. Open the blade by moving the blade handle from left to right. The blade handle is located on the front of the toilet bowl. The toilet can be used with the blade open or closed.
4. Flush the toilet:
   - Ensure the blade is open.
   - Press and hold the flush button for several seconds. The flush button is located along the back or side of the toilet.
   - Close the blade after use.

NOTE: Only use toilet manufacturers recommended toilet paper and cleaning/maintenance supplies with your RV's toilet. RV toilet paper is designed to break-down more completely than standard toilet paper; keeping your waste water collection system flowing freely.

Portable Toilet

Select TMC Class B motorhomes are equipped with a portable toilet. The toilet consists of two halves, joined together by a latch mechanism. The top half contains the seat, toilet bowl, fresh water tank (for flushing), and a manual pump to provide flushing water pressure. The lower half consists of a waste tank, flush valve, and tank level indicator.

Waste holding tank (separated from the top half of the toilet). This illustration shows the emptying spout, which is on a swivel to help facilitate emptying the tank.

This self-contained toilet is easy to operate and not difficult to empty. Instructions for using and maintaining the portable toilet are available from the TMC Owners Resource on-line document service, included in the TMC Class B Supplement, or available from the manufacturer's website.

NOTE: The manufacturer recommends always using a portable toilet treatment solution, which helps break down solid wastes. It is also highly recommended to use RV or Marine-type toilet paper to help reduce the possibility of clogging the waste tank.

The portable toilet provided with your motorhome may differ from these illustrations, but operation is similar. Consult the manufacturer's information for detailed instructions.

Waste Water System

The waste water system of your motorhome consists of bathroom fixtures, drainage plumbing, waste water holding tanks, drainage vents, and sewage valves. It is important to familiarize yourself with the motorhome's waste water system, for it does require monitoring, routine and long-term maintenance.

Waste Water Holding Tanks

Your motorhome is fitted with waste holding tanks designed to collect waste water and waste solids. Typically, waste water from kitchen sinks, bathroom sinks and bathroom shower(s) is collected and stored in the gray water tank, while solids from bathroom toilet(s) is collected and stored in the black water tank. Depending upon the floor plan layout, all bathroom waste water may drain to the black water tank. Some Class B models have a cassette toilet, where the cassette serves as the black water tank.

Waste water collection tanks have valves that allow for emptying the tanks into an external sewage collection facility, commonly known as a 'dump station.'

NOTE: When traveling, it is good practice to minimize the waste water (gray and black) carried in your motorhome. This will allow for carrying capacity for other items, if needed. Refer to Section 5, Occupant and Cargo Carrying Capacity (OCCC).

Monitoring the level of fresh and waste water is provided on the Multiplex touch-screen panel, typically indicated in 1/3 increments (except for models with a cassette toilet).

Holding Tank Heaters (if equipped)

Your motorhome may be equipped with holding tank heaters, which are designed to help prevent freeze damage to fresh and waste water holding tanks.

These heaters are installed underneath the holding tanks and are controlled through the main multiplex panel or a separate switch. Holding tank heaters are manually operated, and should be used whenever you encounter weather conditions that are at or below 32° F (0° C).

Termination Valves and Sewage Discharge

NOTICE

The termination valve assembly limits ground clearance of the vehicle. To prevent damage, use caution when encountering rough pavement, curbs, speed bumps, etc.

Typical termination valve layout

The components of the sewage discharge system are located underneath and to the rear of the motorhome. Configurations vary due to model and floor plan, but all function the same.

Emptying Waste Water Holding Tanks

NOTICE

When connected to a campground sewer system, keep the termination valves CLOSED until the waste water storage tanks need to be emptied. Doing so will prevent campground sewer gases from entering the waste water system of your motorhome.

NOTE: Always wear rubber or vinyl gloves and protective eye-wear when emptying the waste water holding tanks.

1. Remove the cap from the sewer drain and connect the flexible sewer drain hose (typically customer supplied).
2. Place the other end of the flexible sewer drain hose into the dump station inlet. Be sure both ends of the flexible sewer drain hose are secured.
3. Drain the black water holding tank first by pulling the termination black-colored 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 flush pedal, hand flush handle, or use the black tank flush (if equipped).
4. Drain the gray water holding tank by pulling the gray-colored termination valve handle away from the valve body. Draining the gray water holding tank after the black tank allows the soapy water in the gray water holding tank to rinse the flexible sewer drain hose.
5. When both the black water and gray water tanks are emptied, close the both termination valves by pushing the handles back to the closed positions.

6. Remove the flexible sewer drain hose, and rinse it thoroughly with clean water. Remove the other end from the dump station inlet, and replace it in its storage container.
7. Replace the sewage caps on both the motorhome outlet and the dump station inlet.
8. Flush the toilet a few times to add a small amount of water to the black tank. This will help keep any remaining solids from drying to the tank surfaces.

Emptying the Gray Waste Water Tank; Floor Plans without a Black Waste Water Tank

NOTICE

The Sewage Hose Storage Bay could be damaged by speed bumps or other road hazards. Always be conscious of road conditions and the potential of under-carriage damage to low-mounted devices.

On floor plans without a black waste water storage tank, a gray waste water tank is installed. To empty the gray waste water tank:

1. Open the sewage hose storage compartment, located along the lower left side of the motorhome (Figure 5).
2. Extract the sewage hose and place the end of the hose into the sewage disposal inlet (Figure 6).
3. Pull open the gray handle on the termination valve.

Figure 5

Figure 6

4. When the waste water stops flowing, close the termination valve and open a faucet in the motorhome (either the bath or kitchen) for a short period to place a gallon or so of rinse water into the gray waste water tank.
5. Turn off the faucet and open the termination valve to rinse and empty the gray waste water tank.
6. When rinse water stops flowing, close the termination valve and stow the sewer hose.

Emptying the Toilet Cassette

NOTICE

- **Do not allow the waste cassette to become too full.**
- **To prevent water damage to your motorhome, do not travel with a waste cassette that is more than 3/4 full This may cause leakage through the venting system.**
- **The manufacturer's toilet additives are environmentally safe to empty into septic and sewage disposal systems.**

The cassette toilet has a built-in level indicator that indicates when the waste cassette is full and requires emptying. When the slide turns from green to red, the waste cassette is full.

The toilet cassette is accessed by an external panel located on the left side of the motorhome (Figure 1).

1. Open the access panel door and press the blue latch to release the cassette (Figure 2).
2. Pull the cassette out of the cassette bay. Be careful not to drop the cassette, it may be heavy. NOTE: The cassette has a sealing mechanism that automatically closes the inlet when the cassette is removed from the bay (Figure 3).
3. Lower the cassette to the ground, placing it on its built-in wheels and extend the transport handle (Figure 4).
4. Transport the cassette to a sewage waste disposal site.
5. Rotate the discharge neck, uncap, and while pressing and holding the vent button with your thumb, empty the cassette in the sewer inlet.
6. Most sewage disposal sites have rinse water available. Rinse the cassette with approximately 5 liters of water, emptying the rinse water into the sewage inlet.
7. Remove the float from the waste cassette and rinse with clean water. Return the float mechanism to the waste cassette.
8. If it is desired to continue using the toilet, prepare the waste cassette for use as previously instructed.
9. Return the cassette to its storage bay. Be sure the carrying handle is collapsed, the discharge neck is capped and

rotated to the stowed position, and the cassette latch is secured. Close the access panel door.

NOTE: Never use force if you cannot get the waste cassette back into its storage bay easily. If blockage occurs, always check to determine if the blade handle is in the closed position.

Figure 1

Figure 2

Figure 3

Figure 4

Black Tank Rinse (if equipped)

⚠ CAUTION

Do not use the black tank rinse system unless the black tank termination valve is in the open position.

The black tank could overfill if the termination valve is not open, which will result in an unsanitary spill, leading to illness or potential personal injury.

If your motorhome has a black tank rinse system (San-T-Flush, or similar rinse port), it is located along the left rear of the motorhome. After black tank dumping, some solids may be left at the bottom of the black water tank as well as on the tank sidewalls. The black tank rinse is designed to help flush the black tank of waste solids. To use:

1. Ensure the sewer hose is connected to the motorhome's sewer outlet and the dump station inlet.
2. Connect a garden hose (reserved for this task) to the dump station water supply and the black tank rinse port. For sanitary reasons, **DO NOT USE YOUR POTABLE FRESH WATER HOSE FOR THE BLACK TANK RINSE OR OTHER WASTE WATER CLEAN-UP PROCEDURES.** Do not turn the rinse water ON until the black tank has emptied.
3. Ensure the black tank termination T-valve is OPEN.
4. Turn ON the rinse water and let the water run for several minutes. During the rinsing/flushing process, be sure the termination valve remains open and the flexible sewer drain hose remains connected between the motorhome's sewage drain outlet and the dump station inlet.
5. When rinsing/flushing is complete, turn off the water supply. Disconnect the water hose from the black tank rinse port.
6. Close the black tank termination valve.
7. Disconnect the sewer hose from the motorhome. While the other end of the sewer hose is connected to the dump station inlet, rinse the sewer hose, inside and out, with water from the dump station water supply or your on-board water hose. Let the rinse water drain into the dump station inlet.
8. When complete, stow the sewer hose and rinse hose.

Sanitizing the Fresh Water System

Sanitize the fresh water system before initial (first time) use, after extended periods of motorhome storage, at least every 6 months during continuous use, or if the fresh water system, fresh water supply, or fresh water holding tank has been compromised or contaminated.

1. Remove or by-pass the potable (drinking) water filter (if equipped).
2. Prepare a sanitizing solution of one gallon (3.78 l) of water and ¼ cup (2 oz/60 ml) of liquid household bleach (5% sodium hypo-chlorinate solution). You will need one gallon of solution for every 15 gallons of fresh water holding tank capacity.
3. Empty the fresh water holding tank.
4. With all faucets and drain valves closed, pour the solution into the fresh water tank, via the gravity fill port. Or, carefully pour 1/4 cup (2 oz/60 ml) of bleach for every 15 gallons of fresh water holding tank capacity into your potable (drinking) water hose before connecting it to an external water source. Open the external water source valve. The water source pressure will push the chlorine and water into the fresh water tank, making the correct dilution when the fresh water tank is full.
5. Completely fill the fresh water tank with fresh water and close the valve on the external water source (if connected to the city water fill port).
6. Switch ON the water pump. Open all the faucets one at a time until all air is purged, and the water begins to flow; then close the faucets. This ensures the water lines are filled with sanitizing solution.
7. Top off the fresh water tank until the water level reaches the overfill spout. Turn OFF the water pump.
8. Allow the solution to stand in the fresh water system for at least three (3) hours.
9. Drain the fresh water system by opening all faucets, fresh water tank drain valve, and low point drain valves while flushing the system with fresh potable (drinking) water.
10. Continue flushing the system, allowing the water to flow for several minutes.
11. Close the fresh water tank drain valve and the faucets. Refill the system with potable (drinking) water.

Winterizing the Water System

⚠ 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.

Only use biodegradable RV antifreeze to winterize your motorhome's fresh water system.

NOTICE

Do not add antifreeze to the water heater. Antifreeze can be damaging to internal components of the water heater. For proper water heater winterization, drain the water heater tank AND bypass the water heater inlet before adding antifreeze to the fresh water system.

IMPORTANT! Read and follow the manufacturer's instructions for winterization of the furnace/water heater. These instructions also include important safety and maintenance procedures for the unit.

Preparing for colder weather or storage is an extremely important part of routine motorhome maintenance. The motorhome should be winterized at the end of the camping season, or when exposed freezing and below freezing temperatures (32°F; 0°C). Repairs due to freezing liquids 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 by parking on a level surface.
2. Turn OFF the furnace/water heater switch on the controller or multiplex panel.
3. Turn OFF the main gas valve (solenoid) and at the furnace/water heater (if a second valve is installed).
4. Drain the fresh water plumbing system by opening all low-point drain valves, fresh water tank drain valve, and drain the tank of the furnace/water heater.

   Refer to the water heater manufacturer's instructions for winterizing procedures.
5. Remove or by-pass the potable (drinking) water filter (if equipped).
6. Turn the water heater bypass valves (if equipped) to the BYPASS position. **DO NOT ADD ANTIFREEZE TO THE WATER HEATER.**
7. Close the low point drains.
8. 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, place the container on a surface approximately two feet above ground level and use a short length of garden hose (15 feet or less).

9. 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.

10. Open the hot water side on all faucets (kitchen, lavatory, shower, and exterior shower) until RV antifreeze begins to flow continuously.

11. Close the hot water faucet valves and repeat with the cold water faucets; opening the valves, then close the valves when antifreeze flows through the faucet.

12. Flush the toilet a couple of times until you see antifreeze in the bowl.

WHEN YOU ARE DONE ADDING RV ANTIFREEZE:

13. Remove the water hose from the container of RV antifreeze.

14. To prevent staining, wipe the RV antifreeze out of the sinks, shower, and toilet using a soft, dry cloth.

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

De-winterizing The Water System

1. Drain the holding tanks (fresh water and waste water).

2. Attach a potable water hose to the fresh water tank fill and fill the fresh water tank.

3. Turn ON the water pump 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 Sanitizing the Fresh Water System.

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 valve, if equipped).

NOTE: Although most RV antifreeze solutions are biodegradable, high concentrations may be damaging to plant and animal life. Check with local ordinances regarding the proper disposal of RV antifreeze.

For information concerning your particular motorhome's water system and installed equipment, contact TMC Customer Care or refer to the TMC Water System Guide, available from the TMC Owners Resource.

Cold Weather Use of the Water System

NOTICE

Temperatures below freezing (32°F; 0°C) can damage water system components. Damage caused by freezing temperatures may not be covered by warranties. Always ensure the water system of your motorhome is protected from freeze damage.

Many owners choose to use their motorhomes throughout the entire year or encounter freezing temperatures during travel. Due to the risk of severe damage, prolonged use of the water system in severely cold weather is not recommended. However, winter traveling can be safe for you and your motorhome's water system if you follow a few precautions.

To avoid damage caused by freezing, the water system and storage tanks of your motorhome are dependent on the ambient temperature of the motorhome remaining above 32° F (0° C). When fully functioning and the temperature is set properly, the furnace will provide enough heat to protect the water system. In severe cold however, it is wise to monitor the water temperature in the tank, and take appropriate steps to drain and winterize if necessary. In weather below freezing, it may also be necessary to open the lower cabinet doors at night in both the bath and kitchen areas to keep warmer air circulating around the water pipes, drain pipes, and fixtures. Use your electric holding tank heaters (if equipped) and always ensure you have an adequate supply of LP fuel to keep the furnace operational.

Regularly test your LP/CO detector to ensure that the breathable air inside the motorhome remains safe.

If you are going to leave the motorhome unheated for any length of time in severe cold conditions, you must drain all water from the system. This includes draining the water heater and water supply lines. Also protect drain P-traps with antifreeze. Refer to the system winterizing procedures outlined in this guide.

In cold weather conditions, consider carrying cooking and drinking water with you in plastic bottles and jugs instead of using the on-board fresh water system. If you decide to use bottled water, prevent water from being placed down drains or being flushed down the toilet. Water that remains in P-traps and holding tanks is susceptible to freezing. If available, use campground bathhouse facilities.

NOTE: For additional information on your motorhome's water system, refer to the TMC Water Systems Guide available through the TMC Owners Resource on-line document service.

Care and Maintenance

Chassis (Vehicle) Maintenance

For information regarding proper maintenance and other important chassis details, refer to the vehicle manufacturer's owner's manual. As the owner, you 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 information on locating a service center near you.

NOTE: All issues regarding the chassis (vehicle) warranty, parts, and service should be directed to the chassis (vehicle) manufacturer.

Follow the recommendations outlined in the chassis (vehicle) manufacturer's owner's manuals to ensure that proper safety, performance, and maintenance procedures are performed.

General Information

Periodic maintenance and cleaning of your motorhome is necessary to retain the dependability, safety, and appearance that will provide you with many years of trouble free operation, as well as protecting your investment.

Make sure you read and follow all the maintenance instructions and schedules that appear not only in this manual, but also in the manuals provided by the chassis manufacturer and various component manufacturers. Keep good records of maintenance procedures performed, and make sure you perform all owner obligations as may be required to keep your warranties in force.

It is also important to note that operating conditions will affect service timetables. Driving in extreme conditions such as heavy dust, continuous short trips, or start and stop heavy traffic means that service durations will be shortened. Discuss service timetables with both your RV dealer and chassis service representative. Preventative maintenance will pay for itself many times over by catching or preventing problems before they occur. Often, repair costs are greatly increased due to a small problem left unattended, begins to affect other parts and systems of the motorhome.

If there are cleaning, maintenance, or procedures for which you are unsure of performing, please contact your dealer or chassis service representative for recommended instructions.

NOTE: Expenses and obligations of performing periodic maintenance service are not covered under Thor Motor Coach's Limited Warranties.

Condensation

Excess moisture trapped within your motorhome can cause severe long-term damage to laminates, surfaces, fixtures and other components of your motorhome. Therefore, it is important to follow moisture-reducing procedures as a normal routine of motorhome ownership and maintenance.

Tips for Controlling Condensation

To avoid condensation-related problems, follow these tips to help reduce 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, by opening ceiling vents.
- Always use the vent hood when cooking (if equipped).
- Keep the bathroom door closed and the vent or window open, or turn on the ventilation fan when bathing and for a period of time after bathing.
- Do not hang wet clothes in the motorhome to dry.
- In hot weather, start the air conditioner early in the day as it removes excess humidity from the air while lowering the interior temperature.
- When operating the furnace, keep the temperature as reasonably cool during cold weather as possible. Doing so can help reduce condensation on cold exterior walls and windows.
- Use a fan to keep air circulating inside the motorhome so condensation and mildew cannot form in dead air spaces. When possible, leave cabinet doors partially open to aid air circulation.
- A natural tendency is to close the motorhome tightly during cold weather. This may actually increase inside humidity because warm inside air may be more humid than the cool outside air. Allowing some cool outside air into the motorhome may help reduce relative humidity inside the motorhome.

Seals and 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 and maintenance is required to ensure the exterior shell provides a barrier against water intrusion.

The shell should be inspected periodically for the condition of seals and sealants. Check corner and joint moldings for sealant damage. Areas that require maintenance should be resealed utilizing a high quality sealant that has the same or similar characteristics as the original sealant.

Check door, window, and vent seals for cracks, chips or other damage and replace damaged seals as soon as possible. Extra care needs to be given to all roof-related seals to prevent water intrusion from the roof:

- Air conditioner seal or gasket
- Roof racks
- Fans and vents
- All mounting points and wire ports

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

Extended Stay Usage

NOTICE

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, 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.

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

The relatively small living space of an RV contributes to an environment where normal activities of even a few occupants can lead to rapid moisture saturation of the interior air. During cold weather, when relative humidity of the interior air is high, moisture condensation on surfaces can become significant. Estimates indicate that a family of four can vaporize up to three gallons of water daily through breathing, cooking, bathing, and washing.

Unless water vapor is carried outside by ventilation, or reduced by a dehumidifier (customer supplied), it will condense on the inside of the windows and walls of the motorhome. Moisture may also condense out-of-sight, within the walls or ceiling panels, where it can cause warping or staining. Appearance of these symptoms may indicate a serious condensation problem. Always take necessary action to minimize the effects of excessive moisture and condensation.

Cold Weather Usage

When using your motorhome in freezing and below freezing temperatures, these precautions should be taken:

- Make proper preparations to avoid freeze damage to the fresh water and waste water systems.
- Propane regulator freeze-ups can occur in any weather if there is moisture in the tank or if the tank has been overfilled. Always use moisture-free propane fuel and make sure the tank is not filled beyond 80% of capacity.
- During cool weather usage, ventilation or the use of a dehumidifier (customer supplied) may be required to reduce condensation.
- To avoid damage due to cold weather, check the exterior for frozen moisture before operating or using the motorhome's doors, locks, windows, and vents.

NOTE: Thor Motor Coach's Limited Warranties do not cover damage caused by the use of your motorhome in freezing temperatures.

Maintenance Access Panels

There may be maintenance access panels located in key areas of your motorhome. Access panels allow service and

maintenance to electrical, plumbing, gas, and other systems and are identified by a label such as the one depicted here. Access panels may be fastened by screws or bolts.

Storage of the Motorhome

During periods when your motorhome is not in use, care must be taken to ensure damage to your motorhome caused by excessive moisture and other conditions does not occur. The ideal storage location of your motorhome would be in an enclosed, climate controlled environment, however, this is not always possible. Follow these important storage steps to protect your motorhome:

- Turn OFF and disconnect from all water sources.
- Turn OFF all combustion appliances.
- Winterize your motorhome's water system.
  a. Drain and flush all holding tanks.
  b. Drain the water heater tank and fresh water lines.
  c. If freezing temperatures are expected, treat plumbing pipes and fixtures with RV antifreeze.
- Slightly open all closets, cabinet doors, and drawers; this allows for air circulation.
- Close all windows and entrance doors.
- Open a roof vent enough to allow for some limited ventilation, but not so far as to allow snow or rain to enter the motorhome.

When storing the motorhome in climates of high relative humidity (greater than 60% year round) control humidity inside the motorhome by operating a dehumidifier (customer supplied), drained to the exterior.

Winter Storage

When storing your motorhome for the winter, extended periods, or in other extreme conditions, certain precautions need to be made to protect it from possible damage. Make sure to talk with your local RV dealer concerning any special requirements for long-term storage in your geographic area. The following steps are general and your dealer can help you choose those that are most appropriate to your needs.

CHASSIS:

Perform chassis maintenance and recommend storage procedures outlined by the chassis manufacturer (oil, filters, transmission inspection, tires, brakes, etc. Refer to the chassis manufacturer's owner's manual).

TIRES:

Block up motorhome with wooden blocks or on a hard, level surface to relieve the constant pressure on one area of the tires. Inflate tires to their maximum pressure. Cover to protect against sunlight with burlap, plywood or specially designed tire covers, which are available at RV dealerships.

BATTERY(IES):

- Be sure that both the chassis and auxiliary (coach) batteries have the proper electrolyte level and that they are fully charged. Add distilled water and recharge if necessary. (NOTE: batteries installed in your motorhome may be sealed or maintenance-free).
- Batteries should be checked for charge at least monthly. Use of a trickle-charger may be appropriate. Inquire with the battery manufacturer regarding trickle-charging methods. A discharged battery could freeze and may crack the case, causing severe damage to the battery and surrounding area. In storage, a battery will lose charge gradually over a 30 to 45 day period, even when disconnected from the positive and negative battery cables.
- You may wish to remove the batteries from the motorhome and store them in a heated area (approximately 50° – 60° F). However, even in warm storage, the battery charge level must still be maintained.

LITHIUM BATTERY POWER SYSTEM:

Refer to the manufacturer's documentation for long-term storage and care of the Li-ion battery pack(s) and system.

FUEL:

Store the motorhome with a full fuel tank, treated with a fuel additive to prevent condensation buildup and fuel degradation. Use fuel additives recommended by the chassis manufacturer.

DASH AIR CONDITIONER:

Operate the unit for a short period of time throughout the storage period to assure the compressor seal is lubricated.

EXTERIOR:

Clean and wax exterior surfaces. Lubricate locks and hinges. Seal roof joints and mounting points as needed. Follow exterior cleaning guidelines outlined in the TMC Care and Maintenance System Guide, available through your on-line TMC Owners Resource account.

WINDOWS:

Treat seals with silicone spray. Close and lock. Inspect exterior body seals and reseal if necessary.

ROOF:
Inspect mounting points and ports. Reseal if sealant shows signs of shrinking, cracking, or has become hard or brittle.

APPLIANCE VENTS:
Check all furnace, water heater, refrigerator, range hood, and A/C vents for blockages. Remove nests created by pests and other debris. Inspect periodically throughout the storage period and keep vents open.

AIR CONDITIONER(S):
Remove air filters and clean or replace. Cover the exterior shroud.

GENERATOR:
Prepare the generator for long-term storage as outlined in the manufacturer's instruction manual.

WATER SYSTEM:
Winterize the water system as outlined in the Water System Section of this manual.

PROPANE SYSTEM:
- Inspect all hoses, pipes, valves, joints, and couplers for leaks. Refer to Propane Leak Test in Propane Section.
- Turn off all propane supply valves and appliances and keep vents open, while preventing vents and intakes from becoming blocked due to insects or rodent nests.
- After storage, inspect entire propane system, including vents, before use.

INTERIOR:
- Remove all food items.
- Clean all interior surfaces and fabrics.
- Inspect the interior of the motorhome monthly while in storage to make sure leaks have not developed, or condensation has not formed that can cause damage to interior components. Condensation can most readily be observed as moisture accumulation on windows and exterior surfaces. To reduce condensation, make sure to ventilate the motorhome during storage.
- Use insect and rodent repellents to protect against damage; following repellent manufacturer's guidelines. Test to ensure repellent will not damage surfaces.

CURTAINS AND BLINDS:
Close all the drapes and curtains, and protect the curtains from sun fading by placing foil or paper between the windows and the curtains/blinds.

MICROWAVE, COOKTOP, AND OVEN:
Clean interior and exterior surfaces with mild detergent and water. Wipe dry. Ensure all appliances are OFF.

REFRIGERATOR:
Clean inside and outside surfaces. Leave doors propped slightly open to allow for air circulation. Leave an opened box of baking soda inside the refrigerator to prevent odors.

SINKS, TOILET, AND SHOWER:
Clean with disinfectant and dry. Pour one cup of nontoxic RV antifreeze into the drains to prevent freezing. Wipe-up any spilled antifreeze from surfaces.

Additional Care and Maintenance Information

For additional information regarding the care and maintenance of your motorhome, please refer to the TMC Care and Maintenance System Guide, available as a download from the TMC Owners Resource document service.

- Follow all maintenance instructions provided by the component manufacturers of the devices installed in and on your motorhome.
- Refer to the vehicle manufacturer's owner's and service manuals for care and maintenance of the chassis, drive train, and other components that comprise of the vehicle portion of this motorhome.

Maintenance Schedule

The following maintenance schedule contains information pertaining to the living quarters of this motorhome. Always defer to the vehicle manufacturer's service and maintenance recommendations for servicing and maintaining the vehicle portion of this motorhome.

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.
Engine/Chassis	x			x			x	Check engine oil and top off with type recommended by chassis manufacturer. Change oil and filter at recommended mileage intervals.
	x						x	Check fluid levels including: brake, steering, coolant, transmission, washer, etc. Top off reservoirs as needed with fluids recommended by chassis manufacturer.
	x						x	Inspect underneath engine and transmission for leaks. Repair as necessary.
				x			x	Inspect air and fuel filters and replace at interval recommended by chassis manufacturer.
					x		x	Inspect chassis battery, terminals and cables. Repair and replace as necessary.
					x		x	Inspect suspension, steering components, exhaust systems etc. Repair and replace as necessary.
	x						x	Generator exhaust: inspect for cracks, blockages, damage. Replace immediately if any faults are discovered.
Brakes	x		x			x	x	Check fluid levels. Top off reservoir as needed with fluid specified by chassis manufacturer and only from an unopened container.
				x			x	Inspect pads and rotors. Replace as necessary.
	x				x		x	Inspect parking brake for proper function. Repair and replace as necessary.
	x						x	Inspect brake lights and turn signals for proper function. Repair and replace components as needed.
	x						x	Inspect brake controller (towing) for proper function. Repair and replace as needed. Note: typically not factory installed.
Weight Distribution	x						x	Check for proper weight distribution of equipment and components. Place heavy items as near and over axles as possible.
							x	Weigh loaded motorhome with vehicle scales to determine loading. Do not overload vehicle per GAWR and GVWR ratings (see manufacturers specifications).
Tires	x						x	Inspect for proper inflation (PSI). Inflate to proper cold pressure (PSI). Inspect for wear. Repair or replace ONLY with tire(s) of proper size and load rating. Unusual wear patterns indicate problems that should be addressed by qualified technicians.
	x						x	Check all wheel lug nuts and tighten using a properly calibrated torque wrench. Torque per chassis manufacturers specifications.
	x						x	Inspect spare tire for proper inflation (PSI). Inspect for cracking, aging. Replace as necessary.

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Wheel Alignment							x	Inspect tires for uneven wear, dents in the wheel rims, and if vehicle steering seems unusual. All are indications that front wheels need re-aligned. Align as needed with a fully loaded vehicle and only by qualified technicians.
Exterior: mirrors, vision systems	x						x	Inspect rear-view mirrors and adjust when needed. Replaced broken mirrors and components promptly. Inspect rear and side-view vision systems for proper operation. Repair and replace components promptly.
Safety Equipment		x			x			Test smoke alarm. Replace battery annually.
		x			x			Test combination LP/Carbon Monoxide alarm. Replace promptly if found to be inoperable.
				x			x	Inspect fire extinguisher for proper pressure. Replace if low or after any use.
Seat Belts			x				x	Inspect driver and front passenger lap and shoulder belts for wear or defective latches. Replace worn or defective components promptly.
	x		x				x	Inspect all passenger seat belts and latches and replace worn or defective components promptly.
	x		x				x	Inspect child safety harness brackets and tighten bolts if loose. Replace faulty components promptly.
Exterior: windows, doors, seals	x						x	Inspect windshield for cracks, chips, and damaged seals. Repair and replace as needed.
			x				x	Check door and window seals for damage. Repair as needed.
					x			Lubricate hinges, locks, & strike pockets of entrance, storage, and maintenance access doors.
							x	Inspect external corner and edge molding for damage; repair and reseal as needed.
					x		x	Inspect and replace wiper blades and windshield washer system components as needed.
Exterior surfaces			x					Wash surface with warm water and mild detergent. Do not use solvents or abrasive cleaners.
					x			Wax with liquid or paste non-abrasive automotive wax.
Exterior: roof			x			x	x	Inspect and reseal roof and component attachments; vents, antennas, ladders, HVAC, etc.
			x			x	x	Clean roof surface with warm water and mild detergent.
					x		x	Lubricate fan and power vent mechanisms with light oil. Clean surfaces as needed.
					x		x	Inspect air conditioner(s) housing, mounting, condensation drains, etc. Repair and replace as needed.
					x		x	Inspect ladders for broken rungs, loose mounting components and bent rails. Replace as needed.
Exterior: lights	x						x	Inspect running, clearance, side-marker lights and repair or replace as needed.

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Awning	x						x	Operate awnings to ensure proper functioning.
			x				x	Clean awning fabric with warm water and mild detergent. Allow fabric to dry before retracting. Lubricate hinges and joints with silicone grease.
Stabilizers: electric (if installed)	x						x	Ensure stabilizers deploy properly and fully retract. Clean deployment mechanism with mild detergent and rinse with water. Lightly lubricate as needed. Inspect jack pads for damage. Replace worn or damaged components as needed.
Cab/Cockpit	x						x	Vehicle horn: test for proper function, repair if defective.
	x						x	Gauges and switches: ensure all vehicle control functions and driver aids are in proper working order before every trip. Repair and replace as needed.
							x	Cockpit seating: lubricate mechanisms, repair or replace damaged seats or seating components.
							x	Inspect heater and air conditioner for proper function. Repair as necessary.
Electrical System: 12 volt			x				x	Check and service auxiliary and chassis battery(ies). Add ONLY distilled water as needed or replace batteries that fail to hold a charge. Do not attempt to open maintenance-free batteries. Keep batteries on trickle charge when stored for an extended period of time.
					x		x	Check battery charging system: chassis alternator, inverter/converter, solar controller. Ensure proper charging voltage via multimeter reading (battery manufacturers charging recommendations).
	x						x	Multiplex system (if installed): check using 'Hot Skin Test'; with a multimeter set to 12 volts, place one probe on main panel and one probe to a known ground. There should be no voltage. If voltage is present, have multiplex system inspected by a qualified technician.
	x						x	Interior 12 volt lighting: repair and replace as needed.
							x	Check 12 volt power plugs, USB ports and electronic device charging stations. Repair or replace as needed.
					x		x	Inspect automatic transfer switch (ATC), inverter, and converter for proper function. Replace fuses or faulty circuit breakers.
	x						x	Inspect radio, navigation, and camera monitoring system. Repair as needed.
					x		x	Inspect towing electrical plug (4-way or 7-way). Apply electrical contact spray or electrical contact grease to contact surfaces.
				x				Solar panels (if installed): clean solar panels with water spray and soft cloth (do not use detergents or abrasive cleaners).
			x				x	Periodically check for BM Pro multiplex software and firmware updates. Follow manufacturer's instructions for downloads.
			x		x		x	If equipped, inspect the lithium battery power system for signs of wear, overheating, frayed wires, or fatigue. Consult the manufacturer's manual for maintenance details.

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Electrical System: 120 volt							x	Inspect fuses and circuit breakers at the fuse box or circuit breaker panel. Replace blown fuses ONLY with type and rating indicated on the panel. Have a qualified electrician inspect circuits associated with blown fuses or circuit breakers to determine if additional repairs are required.
	x						x	Inspect shore cords, receptacles, extension cords for damage. Repair or replace as necessary.
		x					x	Generator: perform maintenance procedures per manufacturers recommendations. Check generator engine oil level regularly and top off as needed with oil type recommended by manufacturer. Check air filter and spark plug, replace as needed.
		x						Test ground fault circuit interruption (GFCI) receptacle(s) to ensure their proper function.
							x	Inspect 120 volt electrical receptacles. Repair and replace as necessary.
Propane System				x				LP tank, pipes, fittings: check for leaks and damage by using a mild soapy solution to detect leaks. Tighten fittings and/or repair as necessary.
					x			LP line pressure: inspect and check tank and gas line pressures by a qualified LP technician.
							x	LP tank purge (new tanks): purge tank of inert gas and fill with propane at certified propane dealer and/or supplier.
Water System			x				x	Water hoses, pipes, and fittings: inspect for leaks or damage. Repair or replace as necessary.
	x						x	Bathroom and kitchen fixtures: inspect toilet(s), sinks, shower, and faucets for leaks and damage. Repair as necessary.
	x						x	Water pump: ensure proper operation. Repair as necessary.
	x						x	Waste water system: inspect drains and holding tanks. Repair clogs. Inspect termination valves and caps. Repair leaks and replace damaged components as necessary.
			x				x	Water heater: inspect for leaks. Inspect gas line for leaks. Inspect inlet and exhaust for insect nests or other restrictions. Repair and replace damaged components. DO NOT SANITIZE.
			x				x	Inspect water supply hose, water filter(s), water pressure regulator, water service hose, and sewer hose for damage. Repair and replace as necessary.
				x		x	x	Sanitize and flush fresh water system.
						x	x	Winterize fresh and waste water systems.

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Heating System	x				x		x	LP (gas) furnace/water heater: inspect for function. Inspect exhaust ports for restrictions. Have qualified service technician inspect furnace annually. Repair and/or replace faulty components immediately.
Air Conditioner	x				x		x	Inspect for proper function. Inspect and clean filters. Repair or replace faulty components as necessary.
Appliances: LP (gas)	x						x	Check ranges, ovens, refrigerators for proper functioning. Repair gas leaks immediately.
Appliances: electric	x						x	Check microwave, refrigerator, fans and vents. Repair or replace as necessary.
Entertainment Systems			x				x	Inspect TV's, radios, DVD player, sound systems, WIFI extender, lifts, and mounting brackets. Repair and replace as necessary.
Beds, Bunks	x						x	Bed conversions: inspect for broken or damaged brackets. Lightly oil hinges and joints. Repair and/or replace damaged components.
Furniture							x	Inspect sofas, dinettes, tables, etc. Repair or replace damaged components.
Fabrics and Upholstery							x	Clean with mild household detergents and upholstery cleaners.
Countertops							x	Clean with mild, non-abrasive household cleaners and soft cloths.
Bath Fixtures, Sinks							x	Clean with mild, non-abrasive household cleaners and soft cloths.
Carpets, Flooring							x	Vacuum and mop and shampoo as necessary. Use water sparingly and wipe-up immediately.

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Index

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