



PATRIOT

OWNER'S MANUAL



MIDWEST
AUTOMOTIVE DESIGNS
LUXURY CUSTOM SPRINTER VANS
REV GROUP



American Coach®

MIDWEST
AUTOMOTIVE DESIGNS
LUXURY CUSTOM SPRINTER VANS
REV GROUP

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SECTION 1

Introduction



INTRODUCTION

Welcome to the luxury world of Class B custom Sprinter based coaches, which combine comfort, utility, innovation, creativity and technology to deliver a travel experience unlike any other in the recreational vehicle industry. Thoughtful design, ergonomic features, precision fit and function, and exquisite finishes are integrated into your new coach to optimize your safety and comfort while you enjoy a first-class traveling lifestyle.

Your luxury coach is the product of assembling premium quality components and additional special features into a Mercedes-Benz Sprinter chassis. Your new Sprinter coach incorporates extended traveling and living capabilities, and unique additional functions within this multi-purpose vehicle. Your Sprinter chassis was manufactured by Mercedes-Benz and its care, use, maintenance, and servicing requirements are specified separately in the Mercedes-Benz Sprinter Operating Instructions that accompanied your vehicle at the time of purchase. Please take time to familiarize yourself with that manual, as it is important to ensure your safety, and long-term satisfaction with the coach. Operating procedures for the drivetrain, steering and suspension, tires, brakes, passenger and vehicle safety systems, along with maintenance and service schedules and other key information related to the chassis are all contained within that important document. Additionally, warranty information related to the Sprinter chassis, and its major components or subcomponents, are covered exclusively by Mercedes-Benz and / or their suppliers.

This manual is intended to help you understand how to operate, maintain, care for, and enjoy the specialized electronic equipment, plumbing, heating, and air conditioning options, appliances, cabinetry, upholstery, flooring, and other custom components that have been added or installed within your Mercedes-Benz Sprinter to up-fit the chassis to its completed state. This manual also covers important safety procedures and warranty information to help you enjoy your new luxury Class B coach with confidence and satisfaction.

In addition to this American Coach Patriot Owner's Manual, other owner's / operator's manuals, instructions, technical data, images, schematics, diagrams, and warranty information are provided separately for certain appliances and components that perform specific functions within your Class B coach. Such items include, but are not limited to the Air Conditioning unit, heater, solar panel power components,

inverter, water heater, water pump, toilet, refrigerator, convection / microwave oven, entertainment equipment (e.g., TVs, Blue Ray player, WiFi, etc.), and other optional equipment that may be installed on your coach. While this manual will provide general guidelines on how to operate and care for these components, you should always read the primary owner's / operator's manuals carefully before operating or trouble shooting any additional equipment that is installed on your luxury Class B coach.

The REV Recreation Group maintains a continuous improvement program to maximize the quality of design, features, and components within its product lineup. It is possible that some product improvements or changes were made subsequent to the assembly of your luxury Class B coach and may not have been included within this Owner's Manual at the time of its publication. Therefore, the information contained herein may or may not be completely representative of every feature and function of your particular coach. Additionally, this Owner's Manual provides graphics, schematics, images, diagrams and instructions of a general nature, which may not match the exact colors, fabrics, components, or options on your vehicle as delivered.

Throughout this document you will find special statements or alerts, which are intended to draw your attention to potential hazards and dangers, or to advise caution or specific notes of importance to the safe and proper operation of your luxury Class B coach. **ALWAYS read and obey these alerts or statements, which include:**



DANGER

*This alerts the operator to **SIGNIFICANT HAZARDS** that will result in severe injury or death of persons if not avoided.*



WARNING

*This alerts the operator to **POTENTIAL HAZARDS** that could lead to damage to the coach or its equipment, or to severe injury or death of persons if not avoided.*



NOTE

This alerts the operator to situations that are not likely to result in injuries, but require attention to avoid damage to the vehicle or its components.

**NOTE**

This also alerts the operator to important information that will promote the longevity of the coach, and the efficient operation of the vehicle, and its special systems and components.

**NOTE**

Your Mercedes-Benz Sprinter Operating Instructions and Warranty Supplement include specific Warnings, Cautions, Notes and information that pertains specifically to the safe operation and maintenance of the chassis and its warranty coverage. Do not interpret this American Coach Patriot Owner's Manual as advice, directions, or instructions that supersede or replace the Warnings, Cautions, Notes and information contained within the Mercedes-Benz Sprinter documents that accompanied your coach.

**NOTE**

The operator must become familiar with all information provided within the Mercedes-Benz Sprinter Van Operating Instructions and Warranty information in ADDITION to this American Coach Patriot Owner's Manual, which provides supplementary instructions, guidelines, and information pertaining to the safe and proper operation of the complete vehicle as delivered

**NOTE**

This document serves as a guide to the proper and safe operation, care, and maintenance of your luxury Class B coach. It is not an extension of responsibilities of the manufacturer, its subsidiaries, assigns, or suppliers beyond the warranty as specified in this American Coach Patriot Owner's Manual.

**NOTE**

The owner and/or operator bear an obligation for the proper routine inspection, care, repair, and maintenance of the coach to ensure its safety for use and the long-term reliability of its installed systems and components.





SECTION 2

Limited Warranty



**REV / Midwest Automotive Designs
Limited and Structural Warranty for
Model Year 2020/2021**

Models to Include: *Irok, Legend, Patriot, Passage, Weekender, Day Cruiser, Luxe Cruiser, Business Class, Signature Series, Athletic series, UT Models, Professional Series*

LIMITED WARRANTY TERMS

REV / MIDWEST AUTOMOTIVE DESIGNS warrants that its products, listed above, under normal use will be free of manufacturing defects in materials and/or workmanship provided and installed by Midwest Automotive Designs, (Not to include the chassis or any chassis equipment provided by the Chassis OEM) for a period of one (1) year (unlimited miles) from the date of original purchase for the original owner, except as otherwise provided below. For purposes of this warranty, "defect" means a failure of the material or workmanship to conform to the manufacturer's specifications and tolerances. Paint and enamel finishes provided by Midwest are warranted for a period of one (1) year from the date of purchase, except as otherwise provided below. All component parts or options manufactured or supplied by a vendor to MIDWEST AUTOMOTIVE DESIGNS such as, appliances, electronic components, accessories, etc., shall be warranted for a period of one (1) year except where the original equipment manufacturer's warranty for such component is greater than (1) year, in which case, the Vendor Warranty schedule shall apply. A copy of these Limited Warranty Terms, signed and acknowledged by the authorized selling dealer and the Original Purchaser, must be returned by the dealer to MIDWEST AUTOMOTIVE DESIGNS at the above address following purchase of the Coach by Original Purchaser to be registered. Purchaser must notify MIDWEST AUTOMOTIVE DESIGNS within the applicable warranty period of any failure of the vehicle to comply with this warranty. This warranty covers the above listed coaches only.

■ STRUCTURAL WARRANTY TERMS

MIDWEST AUTOMOTIVE DESIGNS Structural Warranty covers the main conversion construction consisting of seating, hardwood, interior walls, cabinetry, and flooring, for a period of three (3) years or 36,000 miles, whichever comes first, from the original purchase date to the original owner.

■ EXCLUSIONS FROM THIS MIDWEST AUTOMOTIVE DESIGNS LIMITED AND STRUCTURAL WARRANTIES

1. The automotive chassis and chassis system (including the chassis, chassis systems, chassis paint and drive train), tires and batteries, all of which are covered by the separate warranties of the respective manufacturers of these chassis.
2. Components, systems, appliances, electrical equipment, or parts expressly warranted by their respective manufacturer.
3. Defects or performance failures caused by or related to:
 - a. Abuse, misuse, negligence, or accident.
 - b. Failure to comply with instructions contained in the Owner's Information Package or failure to perform other routine maintenance.
 - c. Alteration or modification of the coach or conversion not approved or performed by Midwest.
 - d. Environmental conditions (salt, hail, chemicals in the atmosphere, etc.).
 - e. Normal deterioration due to wear or exposure, such as sealants, fading or discoloration of exterior surfaces or fiberglass, or soft goods, such as fabrics, drapes, upholstery, screen, cushions, mattresses, and carpet wear.
 - f. Coaches on which the odometer reading has been altered.
 - g. Normal maintenance and service items, such as light bulbs, fuses, sealants, lubricants, etc.
 - h. Appearance imperfections, dulling, yellowing, chalking, flaking, peeling or fading of paint, defacing, dents, scratches, chips on any surface or fabric, graphics, exterior materials, or upholstery that may have occurred prior to the Start Date and are normally corrected during the delivery inspection process at the manufacturing plant or at the dealership.
 - i. The cost of transportation in connection with warranty claims, including but not limited to reimbursement for mileage or expenses incurred traveling to or from such repair or replacement locations.
 - j. MIDWEST AUTOMOTIVE DESIGNS shall not be liable for any incidental or consequential damages, including but not limited to any claims for property damage, loss of use, loss of value, loss of income, loss of time, inconvenience, commercial loss, bus fares, vehicle rental, fuel costs,

incidental charges such as telephone calls, or hotel bills, or legal fees or expenses.

- k. Pre-mature deterioration and accelerated wear and tear on coaches used for full-time living accommodations.
- l. Coaches used for commercial or business purposes.
- m. Coaches that are not originally sold by an authorized MIDWEST AUTOMOTIVE DESIGNS dealership, including but not limited to Coaches, sold at auction, wholesale, repossession, salvaged or sold in an otherwise distressed condition.
- n. Motor coaches sold or used outside of the United States or Canada.
- o. Items that are working as designed but that you are unhappy with.
- p. Service work performed by a dealer which is generally covered by the dealer's own service warranty.
- q. Any service performed without prior notification and authorization for the service to be performed.

MIDWEST AUTOMOTIVE DESIGNS reserve the right to make changes in design or improvements to its products or parts without obligation to make or install such changes in any previously built product.

MIDWEST AUTOMOTIVE DESIGNS sole obligation under this Warranty is limited to repairing or replacing original factory equipment parts with equal value and like items, at MIDWEST AUTOMOTIVE DESIGNS options, any component, part or parts thereof which are determined by MIDWEST AUTOMOTIVE DESIGNS to be defective as a direct result from MIDWEST AUTOMOTIVE DESIGNS defective material or workmanship. Any MIDWEST AUTOMOTIVE DESIGNS products found to have defective material and/or workmanship must be serviced or repaired by an authorized MIDWEST AUTOMOTIVE DESIGNS factory representative or by a service facility which has agreed to perform the repairs with the MIDWEST AUTOMOTIVE DESIGNS Warranty Department. All warranty claims must be authorized in writing by MIDWEST AUTOMOTIVE DESIGNS Warranty Department, prior to any expenses being incurred relating to such possible warranty claims.

To the extent Vendor Warranties are made available to the original purchaser by the Vendors to cover any defective component, part,

or condition in a Coach, MIDWEST AUTOMOTIVE DESIGNS shall use reasonable efforts to provide sufficient information to the original purchaser to enable the original purchaser to obtain direct Vendor Warranty coverage or assistance from the applicable Vendor. However, MIDWEST AUTOMOTIVE DESIGNS does not give any warranty, either expressed or implied that any components, parts, or accessories provided by Vendors will be subject to, or meet the conditions of, any Vendor Warranties with respect to such components, parts, or accessories.

After these Limited and Structural terms expire, all liabilities transfer to the retail owner. Repairs made under this MIDWEST AUTOMOTIVE DESIGNS warranty do not constitute an extension of the original warranty period for the vehicle, or for any specific component, or part to the extent that any provision of this MIDWEST AUTOMOTIVE DESIGNS warranty contravenes the law of any jurisdiction. Such provision shall be inapplicable in such jurisdiction, and the remainder of the warranty shall not be affected. The purchaser's exclusive remedy for breach of the MIDWEST AUTOMOTIVE DESIGNS warranty shall be set forth herein. Any action for breach of this warranty must be commenced within the periods stated herein. MIDWEST AUTOMOTIVE DESIGNS neither assumes, nor authorizes any other person to assume for it any other liability whatsoever in connection with its product.

■ LEGAL REMEDIES AND DISPUTE RESOLUTION

Any claim or controversy arising out of or relating to this limited warranty, or breach thereof, shall be settled by arbitration administered by the American Arbitration Association in Milwaukee, Wisconsin in accordance with the Commercial Arbitration Rules of the American Arbitration Association. The laws of the State of Indiana shall be applied in any arbitration proceedings, without regard to principles of conflict of law. Each party shall bear its own costs, fees, and expenses of arbitration. The arbitrator(s) determination and the basis for that determination shall be in writing and shall include an explanation of the basis for the determination. The determination of the arbitrator(s) shall be final and binding and judgment upon such determination may be entered in any court having jurisdiction. The arbitration proceedings and arbitration award shall be maintained by the parties as strictly confidential, except as otherwise required by court order or as is necessary to confirm, vacate, or enforce the award and for disclosure in confidence to the parties' respective attorneys, tax advisors, or



senior management personnel. MIDWEST AUTOMOTIVE DESIGNS makes no warranties other than those expressly granted in this warranty. This MIDWEST AUTOMOTIVE DESIGNS warranty gives you specific legal rights, and you may also have other rights which vary from State to State. Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. Any warranty which may arise as a matter of law is limited in duration to the period of the written warranty.

**NOTE**

Purchaser should refer to their original REV/MIDWEST AUTOMOTIVE DESIGNS Warranty Form W-1 Coach. If you have not already completed this form please contact the dealership where you purchased your Coach immediately.



Please print clearly. All information MUST be completed for warranty purposes.

BY SIGNING BELOW PURCHASER ACKNOWLEDGES AND FULLY ACCEPTS THE OPTIONAL ARBITRATION PROVISION

DEALER _____
(PLEASE PRINT)

Dealer Signature _____

Date _____

Dealer Telephone _____

Starting Mileage _____

Coach covered by this Warranty: _____

Production Number _____ **Model** _____

PURCHASER _____
(PLEASE PRINT)

Purchaser _____

Date _____

Mailing Address _____

City, State, Zip Code _____

Purchaser Telephone _____

V.I.N. _____

Form W-1 Coach



SECTION 3

General Information



GENERAL INFORMATION

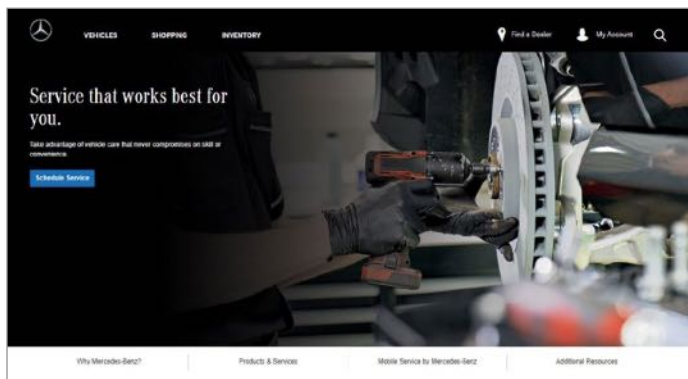
SERVICE // MERCEDES-BENZ

Your luxury Sprinter coach chassis will require routine service, maintenance and occasional repairs as prescribed by Mercedes-Benz. Follow the recommended service intervals prescribed within the Mercedes-Benz Sprinter Operating Instructions that accompanied your vehicle at the time of purchase. Failure to do so could void your warranty, or cause premature failure of costly components associated with the chassis. This is important to protect your investment, ensure the vehicle's longevity, and promote its reliability.

Ordinary services, such as oil changes, replacing cabin air filters, replenishing Diesel Exhaust Fluid (DEF), tire rotation, prescribed and other routine maintenance procedures are available through any Mercedes-Benz authorized dealership that services the Sprinter chassis. The RV dealership where you purchased your luxury Class B coach can also schedule some or all of these services for you, but it is important to note that certain procedures, especially any warranty or recall type of procedures related to the chassis should be completed by a Mercedes-Benz dealership.

Mercedes-Benz dealerships are located throughout the country. **Whenever you need to schedule Mercedes-Benz service, maintenance or repairs, please visit the following portal to locate the nearest dealership:**

<https://www.mbusa.com/en/owners/service-maintenance>



SERVICE // AMERICAN COACH

Care, service, and maintenance of your luxury Class B coach is available through any authorized American Coach or Midwest Automotive Designs dealership that services Class B coaches. Follow the prescribed maintenance schedule provided in Section 13 of this Owner's Manual to ensure your coach receives proper care at all times. This is particularly important for intermittent, seasonal use, and in preparation for long-term storage. Follow the prescribed schedule of services, inspections, and maintenance at all times.

Please contact your dealership when you need service, maintenance, or repair of your coach.



NOTE

You can locate the nearest American Coach Dealership at: <https://www.americancoach.com/>



You can locate the nearest Midwest Automotive Designs Dealerships at:

<https://midwestautomotivedesigns.com/dealer-locator/>



■ CHASSIS AND VEHICLE IDENTIFICATION

The Vehicle Identification Number (VIN) is a 17-digit alphanumeric number that serves as the unique identifier for your vehicle. The chassis VIN is assigned by Mercedes-Benz and is located in any one of the following locations depending upon the year and model of your vehicle: on the driver's side door jam (sometimes on the passenger's side); on a stamped plate located under the windshield on the driver's side; or, on the firewall under the hood. Use the VIN when ordering parts, or scheduling any services, repairs, or maintenance with a Mercedes-Benz dealership. This VIN will also be used to register your vehicle for titling and licensing purposes.

Your coach also has a specific 4-digit Unit Identification Number (UIN), which American Coach and Midwest Automotive Designs have assigned to identify the fully assembled vehicle in its final configuration. The UIN is located on a label attached to the driver's side doorjamb. This UIN is required for coach specific warranty processing, and it may be required to order other specialized parts and accessories associated with the coach itself, which are not available through Mercedes-Benz.



NOTE

This VIN for your luxury Class B coach applies to the Mercedes-Benz chassis only. The UIN applies to the final fully configured coach as delivered. While they both serve to identify the vehicle and important information regarding its assembly, options, and date produced, each has its unique purpose. We recommend that you record both numbers for future reference when scheduling services, maintenance, or repairs.

■ REPORT SAFETY DEFECT CONCERNS

In the event you discover a known or potential safety issue or defect that could result in personal injury or a vehicle crash, please notify American Coach / Midwest Automotive Designs immediately. You should contact the American Coach / Midwest Automotive Designs Warranty and Customer Service Office at 574-522-4878 to report any known or suspected safety related issues or concerns with your vehicle.

You may also choose to contact the National Highway Transportation Safety Administration (NHTSA). If the NHTSA receives similar reports from others this could indicate that a safety-related defect exists that warrants potential further investigation.

The NHTSA operates the U.S. Department of Transportation's (DOT) Vehicle Safety Hotline to collect accurate and timely information from consumers on vehicle safety problems. Call 888-327-4236 or 800-424-9393 toll-free from anywhere in the United States, Puerto Rico, and the Virgin Islands to register complaints or receive recall information about a vehicle. The Hotline also offers a dedicated number, 800-424-9153, for use by hearing impaired persons.

■ ROADSIDE EMERGENCIES

Roadside emergencies with a recreational vehicle require careful handling and attention to ensure the safety of the operator, all passengers, and nearby motorists and pedestrians. In an emergency, and whenever possible, move your vehicle to a safe and level area away from traffic without making sudden or extreme maneuvers. Avoid parking on soft or unstable surfaces as these could destabilize your vehicle or increase the difficulty of handling roadside emergencies such as changing a flat tire. In any emergency, vehicle occupants should exit through the passenger door, driver's door, or the sliding passenger side door. Do not attempt to exit through the rear door unless no other option exists, and there is a clear pathway to that exit.



WARNING

Exiting a disabled vehicle on a busy road or highway, without first observing approaching oncoming traffic, could lead to severe injury or death of persons if not avoided. All occupants exiting a disabled vehicle under these conditions must take extra precautions to get well clear of the disabled vehicle and any approaching traffic.

For Roadside Assistance with your Mercedes-Benz Sprinter RV, contact the Mercedes-Benz Roadside Assistance Hotline, which is monitored by Mercedes-Benz 24 hours a day and 365 days a year at 877-762-8267 (USA) or 800-387-0100 (CANADA).



NOTE

*Refer to the **EMERGENCY** and **ROADSIDE ASSISTANCE** sections of your Mercedes-Benz Sprinter Operating Instructions for additional information.*





SECTION 4

Safety



GENERAL PRECAUTIONS

Operating your luxury Class B Sprinter Van requires special attention to safe operating procedures beyond those associated with an ordinary passenger vehicle. These specially equipped vehicles are heavier and taller than most passenger cars and vans. Understanding their handling characteristics and limitations is essential to ensure your safety and enjoyment.

Additional interior furnishings and appliances may limit the operator's visibility of blind spots. This is particularly important when changing lanes, backing, and parking your coach. Don't forget that you must also be aware of overhead clearance to avoid coming in contact with low hanging tree limbs, signs, or other possible overhead obstacles. Take your time to familiarize yourself with the Mercedes-Benz safety features that may assist you with blind spot monitoring, parking, and lane keeping to enhance your driving confidence.

You must take extra precautions to properly load your coach, and to avoid increased hazards while driving in bad weather or in high cross-wind conditions. Your luxury Class B coach has a tall profile in relationship to its length, which will influence how it handles on steep grades, in high winds, and while traversing any uneven terrain. Maintaining a low center of gravity, and avoiding extreme sudden maneuvers or significant side-to-side angles will reduce any roll-over potential.



DANGER

Failure to take proper safety precautions when loading and operating your coach can lead to a crash, damage to the vehicle, and / or serious personal injuries or death.

■ SEATING AND SAFETY RESTRAINTS

Before driving your American Coach Patriot, refer to the instructions for the proper use of your vehicle's safety restraints, which are covered in your Mercedes-Benz Sprinter Operating Instructions. Please note that there are additional safety restraints installed in your coach to protect adult passengers and children (but not infants) seated in the rear of the vehicle.



DANGER

Rear lap belt restraints are not intended for use with an infant or toddler car seat, as the rear bench seat does not provide a three-point or seat top tether to prevent an infant / child car seat from rolling forward in a sudden braking or collision scenario.



DANGER

All passengers must be secured by a vehicle safety restraint at all times whenever the vehicle is in motion. Never release the restraint or stand up in a moving vehicle as the sudden loss of security could result in serious injuries or death.



WARNING

The Mercedes-Benz Sprinter Van safety restraint warnings apply to the front driver and passenger seats only. The warning status of any unfastened rear passenger seating restraints will not display on the dashboard of your Sprinter Van. Therefore it is essential to verify with all passengers visually and verbally to ensure they are properly "buckled in" before moving the vehicle.

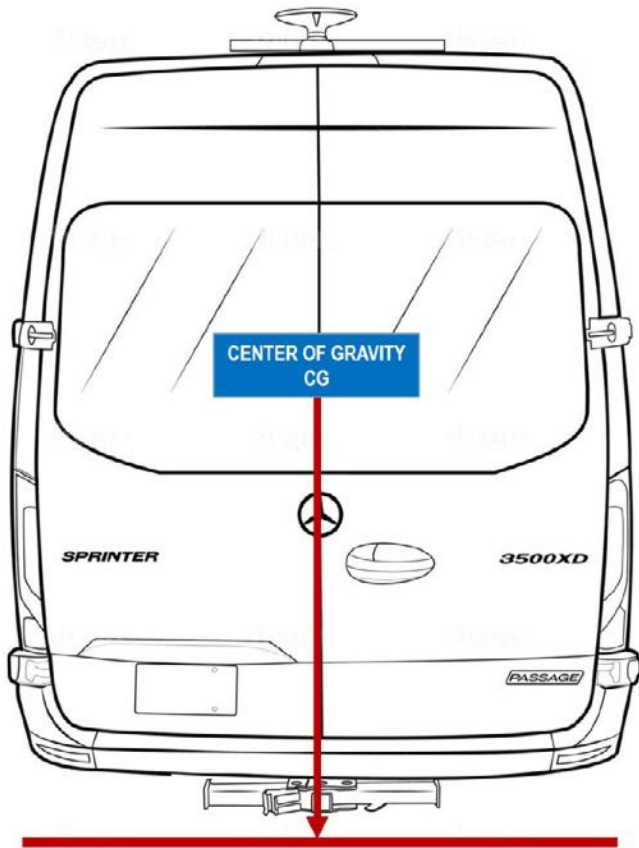
■ VEHICLE LOADING AND STABILITY

At first glance, you should immediately notice that your American Coach Patriot is a tall vehicle. This feature enables occupants to easily move about the coach's interior and increases the utility and efficiency of installed appliances and the ability to store cargo, gear, and luggage. Many factors such as how you arrange the storage of items, where any passengers are seated, along with the capacity status of water, holding and propane tanks, will affect the stability of your luxury Class B coach.

Safely loading your coach requires a basic understanding of how to maintain a low center of gravity throughout the vehicle to promote its stability. The center of gravity (CG) is the point at which the total weight of your Class B coach is concentrated, both front to rear and side to side. The lower the center of gravity, the more stable the vehicle becomes. When heavy objects are stored or placed higher in the vehicle, or gear and accessories are stored on top of the coach, the center of gravity rises, which makes the vehicle less stable. Therefore, the heaviest objects stored in your coach should always be placed on or near the floor (example, luggage).

The stability of your coach becomes more important when operating in high cross winds, while driving on snow and ice, when traversing undulating terrain, and while driving on loose gravel or dirt roads. Keep in mind that any loose gear, luggage, or equipment stored within your Class B coach may suddenly shift or move around, which could change the vehicle's center of gravity and cause it to become unstable. Under such circumstances, you should immediately stop the vehicle and secure any loose items before proceeding further.

Refer to your Mercedes-Benz Sprinter Operating Instructions before driving your coach in these more challenging conditions.



DANGER

Always store luggage, gear, and equipment securely within the vehicle and at the lowest practical level. Failure to maintain a low and secure center of gravity may cause loss of stability and control while driving, and result in severe injury or death of persons if not avoided.



WARNING

Never store heavy objects on the roof of the vehicle. This includes items such as bicycles, kayaks, camping gear, or luggage, which could significantly raise the vehicle's center of gravity. Excessive weight on the roof of the vehicle may cause loss of stability and control while driving, which could lead to severe injury or death of persons if not avoided.



WARNING

Do not attach aftermarket racks for bicycles, spare tires or gear directly to the rear doors of your coach as they are not designed to carry additional weight. Items secured to the doors could suddenly detach, resulting in unsafe conditions and hazards to other drivers.

■ TIRES (INFLATION / ROTATION / TPMS / FLAT / REPLACEMENT)

Tire care and maintenance is critical to ensuring your safety while operating your luxury Class B coach. This is especially true for vehicles used infrequently and / or stored for long periods of time. Always check the physical condition and air pressure of all tires before operating your coach.

Refer to the tire pressure placard located on the driver's side door jamb of your Sprinter Van, or look up the recommended tire pressure settings for your particular vehicle in the Tire Pressure section of the Mercedes-Benz Sprinter Operating Instructions that accompanied your vehicle at the time of purchase. You should also refer to the Tire Pressure Table(s) found within that section of the Operating Instructions. Specifications are provided for both single tires and rear wheel twin tires according to tire size and vehicle load.

Before traveling, always ensure your tires are properly inflated to the recommended pressure settings. If you add or remove air from the tires, you should reset the Tire Pressure Monitoring System (TPMS) in accordance with the directions specified in the Tire Pressure Monitor section of your Mercedes-Benz Sprinter Operating Instructions. This procedure is accomplished through the Sprinter Van's multi-function display. If you are unable or not comfortable with completing this process, any authorized Mercedes-Benz dealership, or your nearest American Coach dealership, can perform this important task for you.



DANGER

Operating with under inflated or overloaded tire(s) increases the risk of an accident.

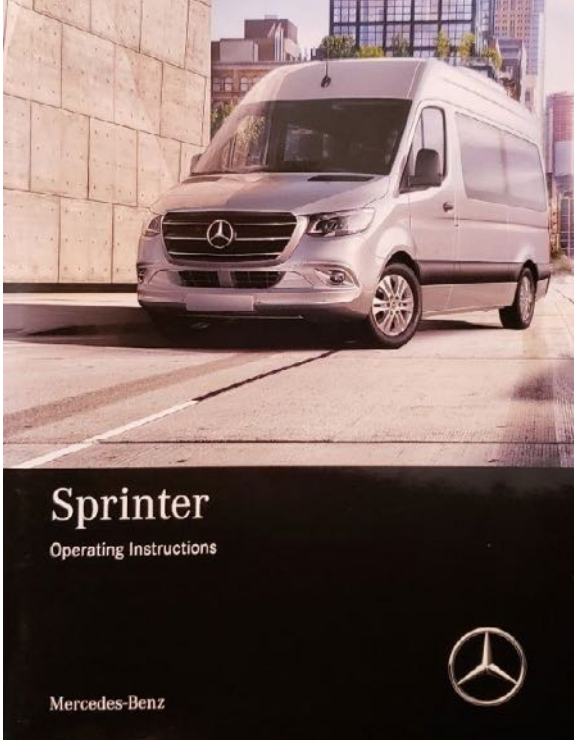


NOTE

In the event of a flat tire, refer to the Flat Tire section of your Mercedes-Benz Sprinter Operating Instructions. Directions and safety procedures for how to replace a tire/wheel assembly are provided in the Wheels and Tires section, along with important technical data and an overview of the vehicle's tire-changing tool kit.

**WARNING**

Risk of severe injury or death of persons resulting from the incorrect positioning and / or tipping of the vehicle and / or jack. Consult the Mercedes-Benz Sprinter Operating Instructions before attempting to replace a flat tire.

**NOTE**

Your Mercedes-Benz Sprinter Operating Instructions provides important information and directions on the safe operation of your luxury Class B Coach.

Tire failures are one of the most common issues associated with recreational vehicles stored for extended time periods. The lack of regular use, failure to maintain proper air pressures, and exposure to UV light and weather will take their toll on your coach's tires. This is true for any vehicle or trailer left unattended for long periods of time.

Unlike a typical passenger car, your coach is less likely to accumulate mileage at a similar rate. Most drivers tend to think about tire wear and longevity in terms of miles driven over the life of the tires, and many passenger car tires are marketed, sold, and warranted in that fashion. However, in the case of RV tires, mileage is often a less significant factor in a tire's life expectancy when compared to the effects of vehicle loads and environmental factors.

Two of the most common causes of RV crashes are linked to tire safety (excessive speed and overloading). An RV driven at excessive speeds or in an overloaded state can cause the tires to overheat and suddenly fail without warning. Should this happen to a tire on a front axle, the resulting loss of steering control can easily cause a crash. For this reason alone, tire safety, care, and maintenance should be a top priority for the operator of your luxury Class B coach at all times. Before you travel, always carefully inspect all tires for wear and signs of aging, such as cracks and dry patches in the sidewalls.

**WARNING**

Tire aging occurs when the rubber components in a tire change over time. It is unavoidable, and can be a serious threat to safety. Always check the physical condition of your tires before operating your coach, and keep an accurate record of tire service and replacements.

The tires and wheels installed on your coach are specifically designed for use on a recreational vehicle. Do not substitute them with tires or wheels that do not meet the original factory specifications. The tires installed on your coach have unique tread wear, traction, temperature, maximum cold pressure, and load specifications. The NHTSA's Uniform Tire Quality Grading System (UTQGS) requires all tires sold in the USA to have a permanently molded label on the tire sidewall to identify those specifications. For additional information on buying, maintenance and tire safety, visit the NHTSA tire safety page at:

<https://www.nhtsa.gov/equipment/tires>

Always replace your tires with the identical size as specified in the Mercedes-Benz Sprinter Operating Instructions that accompanied your coach at the time of sale. Your local Mercedes-Benz dealership or American Coach Dealership can help you maintain, rotate, or replace, the tires on your coach.



NOTE

The tire size is embossed into the sidewall of the tire. In this case, LT 215/85 R16.



NOTE

The LOAD RANGE, MAX LOAD ratings, and MAX INFLATION PRESSURE for SINGLE and DUAL tires are embossed into the tire sidewall.



TOWING

Your American Coach Patriot may be equipped with a Mercedes-Benz installed trailer towing hitch assembly with 7-Pin factory wiring harness. Before attempting to tow a trailer with your luxury Class B coach, carefully read the procedures, warnings, and notes contained within the Trailer Operation section of the Mercedes-Benz Sprinter Operating Instructions.

Your trailer hitch will require the addition of an appropriate draw bar and ball mount, matched to both the size and load capacities of the hitch and the trailer to be towed. Your local American Coach dealership, Mercedes-Benz dealership, or other qualified RV dealership, can provide and install these components for you.



WARNING

Failure to follow the Mercedes-Benz Operating Instructions and the recommended procedures for trailer towing could result in loss of control of the vehicle, leading to severe injury or death of persons if not avoided.



WARNING

Never exceed the Gross Vehicle Weight Rating (GVWR) or the permissible Gross Combined Weight Rating (GCWR) of your American Coach Patriot with its attached trailer. The total load and towing capacities of your vehicle are reduced by any cargo, luggage, and equipment carried aboard the towing vehicle and / or the trailer. Exceeding the GVWR can damage your coach's drive train, tires, and / or brakes, resulting in permanent damage to your coach, and the potential for a sudden loss of control of the towing vehicle / trailer combination.

Before you tow a trailer with your American Coach Patriot, always check the State and local motor vehicle regulations to ensure your combined towing arrangement complies with all highway safety regulations and any restrictions. Trailers are often subject to restrictions regarding overall width, height, weight, and total capacity. They must also comply with Federal Highway Administration (FHWA) lighting requirements. The State Highway Patrol is a good source for any questions regarding towing restrictions.

Your coach's 7-pin wiring connector has an output contact for electric trailer brakes. Before connecting a trailer equipped with electric brakes, consult with your local Mercedes-Benz or American Coach dealership to determine if you will need a separate electronic brake control unit.

Most US States and Canada require a breakaway switch for trailers equipped with a separate braking system. This is regardless of the type of brakes installed (hydraulic or electric). The breakaway switch usually has a cable or chain lanyard that must be attached securely to the tow vehicle to activate the trailer's brakes in the event of the trailer separating from the tow vehicle for any reason.

When towing any trailer we recommend using a sway control device between your coach and the trailer to enhance control and driving confidence. Please visit your authorized American Coach dealership for assistance with installing this simple but highly effective towing safety device.

When traveling long distances with a trailer in tow, check the trailer lights, and the tires frequently on both the towing vehicle and the trailer to ensure they are not overheating. It is always wise to carry a spare tire for both the tow vehicle and the trailer when towing.

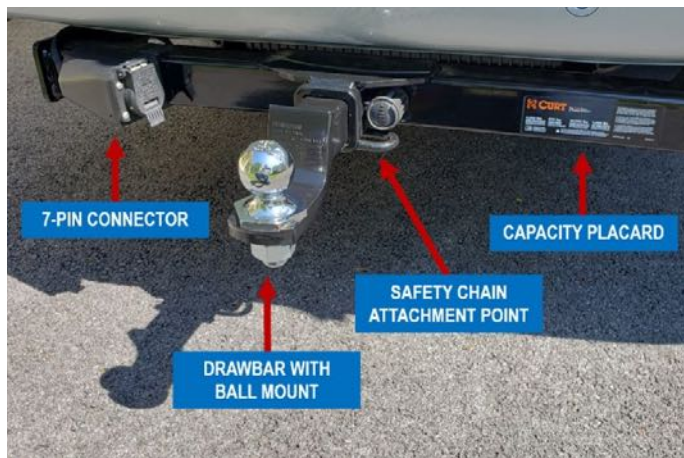
To ensure you have an enjoyable experience while towing a trailer behind you, it is important to take a few moments to prepare. This is a critical safety task, and you should complete it every day before departing on a multi-day trip with a trailer in tow. Check your trailer setup each time you stop for a rest break or whenever you refuel as well.

Before you go, perform a complete safety pre-check of your Sprinter and trailer:

- Tires (condition and pressure)
- Check the hitch connection / safety pin
- Check the trailer safety chains / cables
- Check the sway control (if equipped)
- Ensure the hitch ratings have not been exceeded (capacity and tongue weight)
- Breakaway lanyard is attached to the tow vehicle chassis or hitch (if equipped)
- Electric brakes are functioning
- Wiring harness connection is tight
- Running lights work
- Brake lights work
- Turn signal lights work
- Hazard flashers work
- Verify the security of the trailer's load

Then check your towing vehicle:

- Adjust all mirrors for maximum visibility
- Check the trailer connections again
- Check the electronic brake controller (if equipped) for proper setting of the gain and confirm the brakes apply correctly when you step on the brake pedal



- Confirm you have not exceeded GVWR
- Ensure all cargo, luggage, and gear is stowed securely within the coach
- Verify that the trailer will not make contact with the rear doors, bumper or tail lights when making a sharp turn
- Ensure your Sprinter Van is level and not sagging at the rear. If it is, redistribute or remove weight to ensure it rides level



WARNING

Failure to ensure a proper physical and electrical connection between a trailer and the tow vehicle may result in loss of control, a crash, and severe injury or death of persons if not avoided.



WARNING

Keep in mind that the load in a trailer may shift over time if not properly secured. Always check the trailer's contents to ensure the load has not shifted whenever you stop for a rest break or fuel. Never assume that all is good.



WARNING

When towing a boat, it is also wise to check trailer wheel bearings frequently to ensure they are not overheating. Any sign of high heat radiating off a trailer wheel's center hub or smoke while driving is an indication of an overheating wheel bearing. Boat trailers tend to be more problematic due to their frequent immersion in water, which can damage the wheel bearings.



WARNING

Do not tow with an overheated trailer wheel bearing as it could seize and / or cause a tire to blow out due to excessive heat, resulting in sudden loss of control, a crash, and severe injury or death of persons if not avoided.

The tongue weight of the trailer should typically equal 10% of the gross weight of the trailer with its load. The tongue weight is measured at the front of the trailer directly beneath the coupling, which is the attachment point with your coach's trailer hitch. The tongue weight must never exceed the hitch rating, which is specified directly on the hitch capacity label affixed to the hitch assembly. Correct tongue weight is essential to ensure the distribution of the trailer's weight and the hitch load are appropriate.

Failure to maintain adequate tongue weight will cause vehicle handling issues (usually indicated by excessive sway, or a sagging tow vehicle rear end).

Practice towing with your American Coach Patriot in a large open parking lot before getting on the road. It may take a while to become accustomed to the total length of the combined Sprinter and trailer combination. The turning radius will be significantly larger than usual, and great care will be needed when making turns in confined areas and traffic. Make certain your mirrors provide clear visibility of the trailer. If necessary, you may need to install optional towing mirrors for this purpose which may be purchased and installed by an authorized Mercedes-Benz or American Coach dealership. Many states require towing mirrors by law.

Backing requires a bit of preparation, training, and self-confidence. Never attempt to back your Sprinter / trailer combination without assistance. It is best to have a companion at both the front and rear of the Sprinter / Trailer combination to aid the driver in backing up. They can provide steering guidance and look out for possible obstructions. Make certain any people assisting you are clearly visible to the driver at all times.

The addition of a trailer to your Sprinter will also increase the effect of cross winds as you travel down the highway. Keep this in mind and slow down in high winds as necessary to maintain solid control of the Sprinter / trailer combination at all times. Similarly, stopping distances are increased, so driving on ice and snow, or on loose gravel or dirt roads will make stopping the vehicle more challenging.

When towing, extend the distance between your Sprinter and the vehicle ahead to maintain plenty of stopping space due to the added load of the trailer. Avoid a sudden stop or severe braking under any conditions to prevent "jack-knifing" the Sprinter / trailer combination (a situation where the rear end of the trailer suddenly swings forward, pushing the tow vehicles rear bumper in the opposite direction). A properly set electronic brake controller will help avoid this situation (only applicable to trailers with electric brakes).

Avoid extreme acceleration as it is hard on both the towing vehicle and the trailer. Anticipate longer times required to reach highway speeds and to decelerate. Use the full length of on and off ramps to your full advantage. Once you are on the highway select a lane and stay in it. Frequent lane changing increases fatigue on the driver and increases the possibility of mishaps while towing. When approaching merging traffic, it is best to move to the center or left lane to allow

traffic entering the highway to do so unimpeded. Remember, other drivers who have no towing experience may be unaware of how much additional distance is required for you to safely stop your vehicle.



WARNING

Towing a trailer requires additional acceleration and stopping distances. Sudden maneuvers while towing, improper trailer loading and weight distribution, or exceeding the tow vehicle's rated towing capacity can result in damage to the tow vehicle's drivetrain, brakes, and suspension, and the sudden loss of control, a crash, and severe injury or death of persons if not avoided.

■ OFF-ROAD DRIVING PRECAUTIONS

Leaving the paved highway to operate your Sprinter Van on gravel, sand, grass, and other unimproved surfaces requires special attention. This is particularly true if your coach is not equipped with the optional 4 X 4 (four wheel) drive, which transmits power to both the front and rear axles of the vehicle. Keep in mind that damage associated with operating your luxury Class B coach off-road is not covered under its warranty. Refer to SECTION 2 (WARRANTY).

Before driving in off-road conditions, take note of the road clearance of your coach, which varies depending on which model you have. Refer to SECTION 15 (SCHEMATICS) of this manual to determine the minimum ground clearances for your particular coach. This is very important to avoid damaging your vehicle by bottoming out or coming into contact with rocks, tree stumps, ruts or other uneven surfaces that could lead to a puncture of your holding tanks, damage to exhaust components, generator, plumbing, running boards, or front valance on your coach.

Overhead clearance is equally important. Take special care when driving along trails (especially in heavily wooded areas). Overhead obstacles such as tree limbs, power lines, or rocky outcroppings could easily damage the roof or sides of your coach. When operating in such difficult conditions it is best to have a passenger assist the driver in maintaining a careful watch over potential obstacles. In tight maneuvering situations, an observer should help from outside of the vehicle. That person must be visible to the driver at all times, yet remain safely clear of the vehicle as it negotiates any obstacle(s).

In any situation where your vehicle becomes stuck as a result of bottoming out or encountering an overhead obstacle, the operator should stop immediately. Place the vehicle in park and apply the

parking brake. Then carefully exit the coach to assess the situation. If there is no apparent damage to the coach, it may be possible to slowly and carefully back up the vehicle to free it. This should only be done with the assistance of an outside observer to ensure backing the vehicle will not damage anything. When in doubt, seek professional assistance from a competent towing service. Attempting to free your coach on your own may do more harm than good.

Unlike paved highways and roads, which are carefully graded to promote vehicle stability, off-road driving conditions provide challenges that could increase the risk of a roll-over. Undulating terrain, steep grades, loose ground, rocks, grass, gravel, and mud all contribute to reduced vehicle stability and extended stopping distances. Add ice and snow, or rain to these conditions and a driver may find themselves greatly challenged to maintain safe control over their vehicle.

Even on relatively level ground, a sudden lateral slide of the rear of the vehicle could lead to loss of control and a potential roll-over incident. While 4 X 4 (four-wheel) drive capabilities may help you negotiate off-road terrain with greater traction, it will not prevent a roll-over from occurring. In fact, the increased vehicle height of a 4 X4 chassis, with its associated higher center of gravity, could actually increase roll-over risk.

**NOTE**

Refer to the Mercedes-Benz Sprinter Operating Instructions before operating your coach off-road.

**WARNING**

Operating your coach on unstable ground or uneven surfaces that are not level increases the risk of vehicle roll-over, which could lead to severe injury or death of persons if not avoided.

■ ROADSIDE EMERGENCIES

As with all roadside emergencies, vehicle occupant safety is the top priority. Should your coach become disabled make certain to move the vehicle clear of the roadway (if possible) and park on a level surface with the emergency brake applied. Then, using any of the three emergency exits (driver's door, passenger door, or sliding side door) carefully exit the vehicle after first looking to ensure it is safe to do so. Avoid exiting the vehicle on the side exposed to passing traffic.

These same exit procedures also apply anytime you are camping or staying overnight in your luxury coach. Always make sure the pathway to the exit doors is clear and unobstructed, and never depend upon using a rear door as an emergency exit.

**WARNING**

Attempting to exit a disabled vehicle on the traffic side of a busy roadway could lead to severe injury or death of persons if not avoided. Move all vehicle occupants (including pets if practical) safely away from oncoming traffic using the doors on the side of the vehicle that are least exposed to hazards and oncoming traffic.

**WARNING**

Never place luggage, cargo, or equipment inside the vehicle in a manner that might block the full opening of the driver's, passenger, or side exit doors, as this could impede exiting the vehicle safely in an emergency situation. Be mindful not to park close to trees, walls, buildings, fences, or other obstructions that could prevent opening a door in an emergency.

■ ELECTRICAL (BATTERIES / GENERATOR / SHORE POWER)

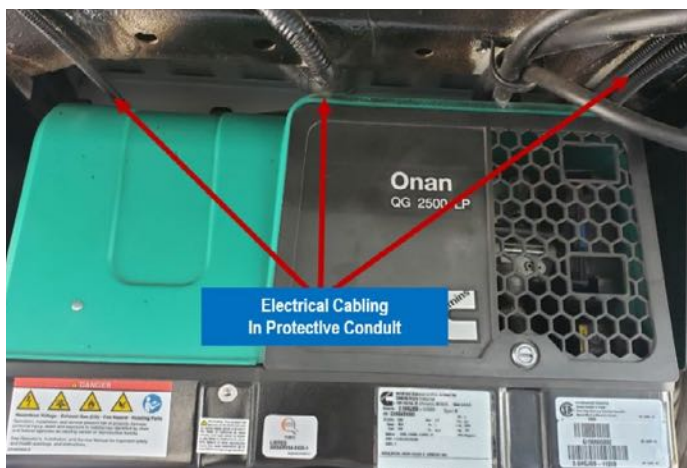
Your coach is equipped with a complex and efficient electrical system that comprises both high voltage (120 Volt AC) and low voltage (12 Volt DC) components. These electrical systems are critical components of your coach, and they require routine care and maintenance, along with regular inspections to ensure they remain fully functional and safe to operate. Both forms of electricity have common hazards associated with them, most notably the potential for electrical shock or fire.

**DANGER**

Do not attempt to service your coach's electrical system by yourself. Service and repair of the electrical system(s) components should only be performed by a properly certified technician. Servicing, repairing, or modifying the electrical system(s) without proper training and knowledge may cause an electrical shock that will result in severe injury or death of persons if not avoided.

Avoid electric shock and fire hazards by paying close attention to how each electrical component functions, its purpose, and its proper operating and maintenance procedures. That information is available within SECTION 9 (ELECTRICAL) of this document, in the operating instructions that apply to the installed appliances in your coach, and within your Mercedes-Benz Sprinter Operating Instructions booklet.

Electrical power is distributed throughout your coach by cabling that is protected from chafing, physical damage, and exposure with insulation, special shielding, and / or flexible conduit. A periodic inspection of the condition of that cabling both inside and beneath the vehicle is important to ensure your vehicle's longevity and occupant safety. This is particularly important should your coach make sudden contact with any obstruction or road debris, as cabling is routed to and from the generator (if so equipped), the batteries, and other components beneath the vehicle. **Below is an example of under coach electrical cabling.**



Regardless of how often you use your coach, its electrical system should be inspected annually to ensure it is safe and in good condition, which can be performed by an authorized American Coach or Midwest Automotive Designs Dealership.



NOTE

The condition of your luxury Class B coach's electrical system(s) should be inspected annually to ensure occupant safety and to promote the longevity of the vehicle, its systems, and key electrical components.

BATTERIES

Your coach has at least two or more batteries installed. One battery provides starting and accessory power to the engine and chassis. The other battery(s) provides "house" power to the coach's lighting system, fresh water pump, entertainment system, and other 12 volt powered accessories and appliances. House battery(s) may be either an Absorbed Glass Mat (AGM) design, or a Lithium Iron Phosphate (LiFePO4) or "Lithium" type. Both perform similar functions but have unique design, charging, performance, and service characteristics. Each has advantages and disadvantages, depending upon how and where you operate your coach.

AGM batteries are considered a flooded or "wet" battery type. They are typically installed in an upright position, though they may sometimes be installed on their side. AGM batteries can tolerate repeated discharging to no greater than 50% of the battery's rated capacity. For example, a 225 Amp Hour AGM battery should never be discharged below 112.5 Amp Hours of capacity. Doing so may permanently damage the battery, reduce its capacity, and its longevity. **Below is an image of a typical AGM battery installation.**



LiFePO4 batteries are a dry cell type of battery that may be mounted in almost any position. They are not limited to a 50% discharge and therefore can provide a significantly greater reserve capacity than a similar AGM battery. For example, a LiFePO4 battery rated at 100 amp hours can deliver nearly 100% of that capacity without damaging the battery. As a result of this efficiency, a LiFePO4 battery package offers substantially greater "off grid" reserve capacity than a coach equipped with an AGM battery(s).

LiFePO4 batteries do have their limitations, the most significant one being their inability to be recharged below freezing conditions. Most LiFePO4 batteries have an integrated battery management system to prevent cold weather charging damage to the battery. To promote LiFePO4 battery longevity and performance, your coach may have optional battery heating assemblies installed, which will aid in their ability to be recharged under cold temperature conditions. **Below is an image of a typical LiFePO4 “Lithium” battery installation.**



AGM and LiFePO4 batteries both offer excellent maintenance free reserve capacity electrical power to your coach, yet they are completely different in terms of design, chemistry, and capabilities. Therefore, never mix AGM and LiFePO4 battery types together. Either will serve you well, and it is possible to have an authorized American Coach or Midwest Automotive Designs dealership convert your vehicle from one type of battery system to the other. However, you should never attempt to complete a battery conversion on your own as this is dangerous work using hazardous materials. Any resulting damage will not be covered under warranty.

**WARNING**

Never mix different battery types together. You may use either AGM or LiFePO4 batteries for house service, but never combine both as this will seriously damage the batteries, your inverter and other electrical components. Mixing battery types can lead to an explosion or fire, which could cause severe injury or death if not avoided.

■ GENERATOR

Your coach may be equipped with an optional generator, which is mounted beneath the vehicle directly behind the rear axle. The generator operates on liquid propane (LP) gas and produces 120 Volts (AC) current to the house side of your coach's electrical system. Refer to SECTION 9 (ELECTRICAL SYSTEMS) for information on how to operate the generator.

Always use care not to overload or damage the generator as this could lead to an electrical shock or fire. Do not exceed the generator's rated electrical load capacity. Never drive your coach through water in excess of 9" in depth, as this could flood the generator case. Avoid hitting any obstruction that could contact and damage the generator housing, exhaust and / or cabling.

**DANGER**

Overloading a generator or submerging it in water, may cause an electrical shock or fire, which will result in property loss and severe injury or death of persons if not avoided.

Never operate the generator in an enclosed space, or with your coach parked alongside a building, wall, or solid fence that could prevent the exhaust gasses from flowing away from the vehicle. Periodically check to ensure the generator exhaust pipe is in good condition and is unobstructed. Refer to your Onan RV Generator Handbook for operating instructions and additional important safety information.

**DANGER**

Operating a generator in an enclosed space or building can expose occupants to high levels of Carbon Monoxide, which will result in severe injury or death of persons if not avoided.

■ SHORE POWER

Your American Coach Patriot has a National Electrical Manufacturers Association (NEMA) 125 VAC, 30 amp “Shore Power” electrical connector mounted to the driver's side rear exterior of the vehicle. This outlet allows the operator to connect a standard NEMA L5-30 shore power cable between the coach and a suitable 30 amp, 125 VAC electrical source. The outlet includes a twist-lock weather / dust cover that must be secured whenever the vehicle is not connected to external power via the shore power cable assembly. The plug is a twist lock arrangement with three contacts for power, neutral, and safety ground.

Below is an image of a typical NEMA L5-30 power cord and twist-lock vehicle receptacle.



Before connecting your coach to an external power source, turn off the main AC breaker inside the coach to ensure there is no load present when you connect the cable. Similarly, turn off the circuit breaker at the power source. Be aware of your surroundings before connecting the cable. Check the cable condition for damage or wear. Ensure the cable is not in contact with wet grass, wet pavement, or mud, and that you are wearing shoes with an insulated sole before connecting your coach to any external power source. Do not wear rings, bracelets, or other loose jewelry that could make contact with the power cable and / or the power outlet.

Before connecting to a shore power source, check with the management at the RV park, dealership, or whomever owns the property to ensure the outlet is properly rated at 30 amps and 125 VAC. Inspect the power outlet carefully for signs of physical damage and corrosion. Make sure the receptacle is a match to your NEMA L5-30 power cord. Never connect to any power source with exposed wires or to a loose power pedestal. If the outlet is not in good condition, or the three prongs on the cable do not exactly match the outlet, do not connect to it.

Route your shore power cord in a fashion that affords it good protection from damage and strain. Be mindful not to create a tripping hazard. Never extend the cable so that it stretches from the vehicle to the power source without lying fully supported on the ground with a drip loop on both ends of the cable. Screw in the plastic retention collar to secure the cable connection to the vehicle, which will limit rain water or moisture from creeping into the outlet on the coach. Once satisfied that the cable and outlet are in good condition, are a proper match, and that the cable is routed and connected safely, turn on the breaker at the source first, then at the vehicle.

After connecting to a shore power source check for the proper operation of your coach's 125 VAC appliances (e.g., convection oven, inductive range, or roof air conditioner). If you suspect the equipment is not operating correctly, double check the power cord to ensure it is properly connected and that the circuit breaker is "ON" at both the source and in the coach. If all appears normal, it is possible that the power source has an issue or may have been wired improperly (e.g., reversed polarity), which is a dangerous situation. When in doubt, disconnect from that power source immediately and try a different power source from a completely different circuit.



DANGER

Always turn the main circuit breaker in your coach to "OFF" before connecting a shore power cable to the vehicle. Always turn the power source breaker to "OFF" before connecting the power cable to the power source. Energize the circuit at the source first, only AFTER the cable is securely connected to BOTH the power source and the vehicle. Connecting an electrical cable to a power source in a wet environment with the circuit breaker in the "ON" position will result in severe injury or death of persons if not avoided.



DANGER

Never use a damaged or worn power cable. Do not use adapters to connect to a power source rated below the required 30 amps and 125 VAC. Connecting to an underpowered source can cause the electrical connection(s), power cables, and / or equipment to overheat, increasing the risk of a fire or electric shock, which will result in severe injury or death of persons if not avoided.



DANGER

Check for proper operation of your vehicle's 125 VAC electrical equipment after connecting your coach to a shore power source. If your 125 VAC electrical system is not operating properly, turn off the circuit breakers in the coach and at the source and check the connection. Disconnect the cable and find an alternate power source if you suspect the power supply is underpowered, damaged, and / or wired in reversed polarity, where the neutral and ground safety protection features of your coach's electrical system may be compromised, which could result in severe injury or death of persons if not avoided.

**WARNING**

Never stretch a shore power cable to its maximum length without properly supporting the full length of the cable. Always leave a drip loop on both ends with sufficient slack to remove any strain from the cable ends at the outlet and receptacle. Cable strain can damage your coach's cable receptacle and / or the cable.

**WARNING**

Shore power cords can become a tripping hazard, which could result in serious personal injuries if not avoided. Route cables with reflective tape, traffic cones, or other means to make the cable clearly visible to pedestrians.

**WARNING**

Electrical cords; PVC coated wires, cords, plugs, and connectors; and other PVC coated products may contain lead, a chemical known to the State of California to cause cancer, birth defects and other reproductive harm. Wash hands after handling your power cord.

**WARNING**

Electrical cables may contain lead, which can cause birth defects or other reproductive harm. Exposure to lead during pregnancy can affect brain development and cause learning and behavior problems for the child. Exposure to lead can harm the reproductive system of men and women. Exposure to lead and lead compounds may increase cancer risk.

■ DETECTORS (CARBON MONOXIDE / LPG / SMOKE)

Your American Coach Patriot is equipped with a variety of safety detectors to warn the occupants in your vehicle of a range of potential physical health hazards. Some of the detector safety information contained within this section is extracted / republished from the operator's manuals associated with safety devices that were installed in your coach. Those devices exist to protect you and your passengers from potential serious harm and they must never be disabled or removed from the vehicle. Check their proper operation regularly and before any overnight stay in the coach to ensure they are fully functional.

■ CARBON MONOXIDE

Each safety detector in your coach has a specific design purpose. Read the operator's manuals and instructions associated with each

device carefully before operating your coach. If you are missing these documents, please contact Customer Service and Warranty at (574) 522-4878 to obtain replacement instruction copies.

Carbon Monoxide (CO) is a colorless, odorless, and poisonous gas. CO forms during the combustion of various fuels such as diesel fuel, liquid propane, gasoline, and other sources such as tobacco smoke. The Mercedes-Benz chassis engine, the LP generator, the heating furnace, and LP water heater, in your coach produce it constantly while they are operating. For this reason, never operate your coach's diesel engine, the heater, the generator (if equipped), or any propane powered cooking or heating device or appliance within an enclosed space or garage. Use care when operating your diesel engine, the diesel heater, or the generator next to buildings, walls, or solid fences that may restrict airflow around the vehicle or possibly redirect exhaust gasses back into the coach. Do not operate the diesel heater or the LP generator with the rear driver's side window(s) or the rear door(s) open, as this could also allow CO gasses to enter the coach.

CO levels can rise rapidly in an enclosed vehicle. Airtight windows, doors, and insulation contribute to conditions that could easily trap CO inside your coach, which could quickly overcome the vehicle's occupants. Weather conditions such as wind direction and speed, humidity, and air temperature can reduce the dispersion of CO gasses. Note how environmental conditions impact the dispersion of the CO gases emitted by your coach's diesel engine, the diesel heater, LP generator, or any other LP appliance such as a propane grill or lantern placed near the vehicle.

Typical symptoms of Carbon Monoxide (CO) poisoning may include, but are not limited to:

- Disorientation, dizziness, or confusion
- Vomiting or nausea
- Headaches or Loss of vision
- Weakness and sleepiness

If you or any passenger(s) present with Carbon Monoxide poisoning symptoms, safely park the coach immediately. Turn off all appliances such as the generator, heater, and the chassis diesel engine. Open all windows and doors to clear the interior of any possible Carbon Monoxide (CO) gasses. Safely exit the vehicle and seek immediate medical attention if necessary. Before resuming operation of the coach, you must first identify the source of the Carbon Monoxide (CO) gas accumulation and determine if this was an isolated issue

caused by temporary conditions, or if there is a mechanical problem that warrants a visit to a Mercedes-Benz dealership or an authorized American Coach dealership.

To enhance your safety, your coach is equipped with a Carbon Monoxide (CO) Detector. The detector is located close to the floor of your coach, usually in the rear of the vehicle (actual location may vary – see image of a typical CO detector installation below). Never block the detector with luggage, gear, or any other items that could restrict airflow past the sensor.



If the Carbon Monoxide (CO) detector/alarm on your coach sounds, it is an indication that high levels of carbon monoxide gas are present. Never assume an audible alarm condition is an indication of a faulty detector or false alarm. The detector is most likely functioning properly, and it is warning you of potentially high concentrations of Carbon Monoxide (CO) gas. If the alarm sounds, but no Carbon Monoxide (CO) is present, check to ensure the batteries have not expired and that the unit is clean. Accumulation of dust or lint could affect its proper operation. Unlike a smoke detector, a Carbon Monoxide (CO) detector is far less susceptible to false alarm conditions.

A Carbon Monoxide (CO) alarm may sound under any of the following conditions:

- Disorientation, dizziness, or confusion
- A leaking or failed exhaust component
- While parked in an area with poor air flow around the vehicle
- In heavy traffic conditions
- In campgrounds or locations where other vehicles are operating engines or LP appliances in close proximity to your coach
- During adverse weather conditions with high temperatures and high humidity levels



DANGER

Carbon Monoxide (CO) is a colorless, odorless, and poisonous gas, formed by the combustion of fuels such as diesel fuel, gasoline, kerosene, liquid propane, coal, and plant derived substances such as wood and tobacco. It can cause birth defects or other reproductive harm. Exposure to Carbon Monoxide (CO) during pregnancy can affect the baby's brain development and cause loss of pregnancy. Carbon Monoxide (CO) can replace oxygen in the bloodstream leading to disorientation, the loss of consciousness, and resulting in severe injury or death of persons if not avoided.



WARNING

Test your Carbon Monoxide (CO) detector before each trip, weekly, and annually when returning your coach to service after long term storage, to avoid severe injuries or death. Never operate the coach without a fully functioning CO detector.



WARNING

Exhaust gases produce Carbon Monoxide (CO) gas, which is deadly. Never restrict or block the tailpipes or exhaust components of your coach. Do not park the coach in a location where airflow is limited or restricted around the vehicle. Do not allow exhaust gases to accumulate inside, around, or beneath the vehicle. Do not leave windows open near exhaust pipes while operating the diesel engine, the heater, water heater, or the LP generator (if so equipped). Check periodically to ensure outside conditions are satisfactory to ensure the safe dispersion of any Carbon Monoxide (CO) gasses.

Test your Carbon Monoxide (CO) detector before each trip, weekly, and annually when returning your coach to service after long term storage, to avoid severe injuries or death. If the unit fails its operational test, replace it immediately. Never operate the coach without a fully functioning CO detector. Replace any Carbon Monoxide (CO) detector that has reached its expiration date.

■ **LIQUID PROPANE GAS (LPG)**

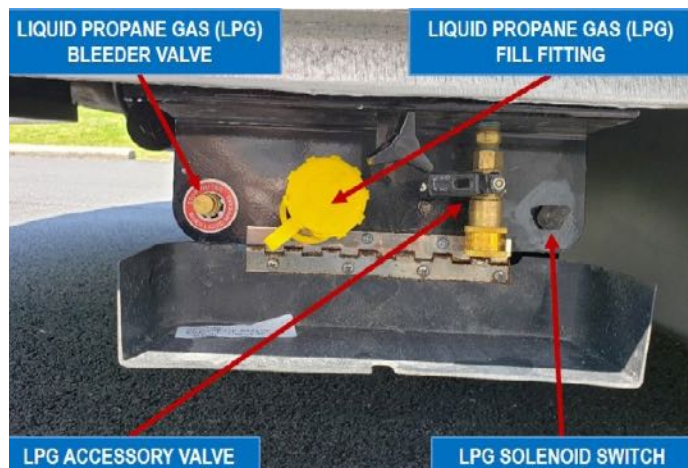
Liquid Propane Gas (LPG) is a highly flammable fuel that may power some of the appliances on your coach and the optional Onan LP generator, depending on how your vehicle is equipped. This clean burning fuel also powers portable gas grills, camping lanterns and

heaters, and other outdoor appliances. If your coach was factory equipped with any Liquid Propane Gas (LPG) appliances, the fuel is stored in a special tank suspended beneath the vehicle.

Liquid Propane Gas (LPG) is heavier than air, and it will settle to the floor in your coach if there is a leak in a fuel line or appliance, or if the fuel has entered the vehicle in vapor form from the outside. Liquid Propane Gas (LPG) in high concentrations can be extremely dangerous and explosive. Therefore, you should not transport any portable Liquid Propane Gas (LPG) tanks inside the vehicle. If you coach is equipped with a propane tank, there is an external Liquid Propane Gas (LPG) connection at the rear passenger side of the vehicle that may be used to power your portable appliances. Storing portable Liquid Propane Gas (LPG) powered equipment such as portable gas grills, lanterns, and heaters in your coach will increase the risk of gas vapors leaking into the vehicle's interior. Those appliances must air out and cool off after use to vent any residual gas before placing them inside your coach.

Turn off all lights, fans, appliances, the vehicle engine, air conditioner or heater, and the generator before filling your coach's Liquid Propane Gas (LPG) tank. Make sure the vehicle has no occupants inside while filling the tank.

Read the warning label next to the filling connection, which is located behind the passenger side rear wheel on the coach. DO NOT FILL THE TANK BEYOND 80% CAPACITY, and make sure the safety bleeder valve is open to prevent over pressurizing the tank. Close the bleeder valve when the tank has reached the 80% full level and stop filling the tank.



Your coach is equipped with a Liquid Propane Gas (LPG) Detector, permanently installed in the coach near the floor. This safety device may be a combination CO / LP detector as depicted in the Carbon Monoxide (CO) section of this chapter above. Never block the detector with luggage, gear, or equipment that could restrict airflow past the sensor. The device provides a visual and an audible alarm if it senses a dangerous level of Liquid Propane Gas (LPG). The alarm activates with a four-beep pattern with a flashing red LED indicator for Carbon Monoxide (CO) gas, or a continuous beeping with a solid red LED light for Liquid Propane Gas (LPG).

Test your detector daily before staying overnight in the coach, at least once weekly, and before the vehicle is placed back into operation after long term storage. Use the Test / Silence button for testing, and to quickly silence any alarms.

Your detector has a "Replace By" expiration dated stamped on it. Any authorized American Coach dealership can replace this device for you. Always replace the detector prior to its expiration date. You should not operate your coach with an expired detector.



NOTE

The Liquid Propane Gas (LPG) detector is connected to your coach's electrical system. There is no internal battery backup. The detector is inoperable if the coach's "house" battery capacity drops below the minimum required voltage level (typically 8 - 15 volts).



DANGER

Liquid Propane Gas (LPG) is a highly explosive fuel that presents significant hazards if allowed to build up inside your vehicle. If the detector sounds, safely open all doors and windows, and exit the vehicle promptly. An alarm condition indicates an LPG leak has occurred and / or an appliance may not be operating properly. Do not smoke, light any flame, or turn on or off any electrical switches during an alarm situation. An explosion and fire could occur, which will result in severe injury or death of persons if not avoided. Do not operate the coach until you have isolated the cause of the leak and corrected it, or have a properly certified technician repair the system or the malfunctioning appliance.



DANGER

Never fill the Liquid Propane Gas (LPG) tank beyond 80% capacity. Excess filling can cause uncontrolled gas flow to appliances.



DANGER

Never transport portable Liquid Propane Gas (LPG) tanks inside the vehicle. LPG tanks are equipped with a pressure relief valve that could suddenly release Liquid Propane Gas (LPG) into the vehicle's interior without warning, creating a dangerous environment that could lead to a fire and / or explosion, and serious injuries or death.



WARNING

Note the expiration date on the face of your Liquid Propane Gas (LPG) detector. The detector expires after 5 years of operation. An expired detector cannot be trusted to accurately detect the presence of gas in the vehicle. Failure to replace an expired detector could lead to severe injury or death of persons if not avoided.



WARNING

Test the alarm operation after the vehicle has been in storage, before each trip, and at least once per week during use. Read the entire Owner's Manual for your detector prior to its use. Your Liquid Propane Gas (LPG) tank and its associated appliances should be inspected annually by a certified technician. This is especially important after bringing the vehicle out of long-term storage. Any authorized American Coach dealership can perform this, which will ensure the system is operating properly.



WARNING

Do not cover or obstruct the detector with anything that could prevent or restrict gas from entering the device.



WARNING

The Liquid Propane Gas (LPG) detector is not designed to detect smoke or fire. A separate smoke / fire detector is installed in your coach for that purpose.



WARNING

The Liquid Propane Gas (LPG) tank, all hoses, valves, and components should be inspected by a certified technician annually, or anytime you detect a potential leak.

■ SMOKE

A battery powered smoke detector / alarm is mounted to the ceiling of your coach. Please read the instructions for the device, which accompanied your coach at the time of delivery. **The image below is a typical battery-powered smoke detector / alarm, which is mounted to the ceiling in your coach.**



The smoke detector / alarm in your coach is battery-powered. Replace the battery(s) annually, or any time the device fails a test or loses power. The device should be tested before each overnight trip, weekly, and annually whenever the vehicle has been placed back into service after long term storage.

Keep the exterior surface of the smoke detector / alarm clean and free of dust in accordance with the manufacturer's recommendations. Your smoke detector / alarm has a limited life expectancy and must be replaced upon its expiration (10 years from date of purchase). Your American Coach dealership can perform this replacement service for you.



DANGER

Never operate your coach with an expired, malfunctioning, or missing smoke detector / alarm, which could result in serious injuries or death of the vehicle's occupants.



WARNING

Note the expiration date of your smoke detector / alarm (10 years from date of purchase), and in accordance with the manufacturer's specifications. An expired detector cannot be trusted to accurately detect fire or smoke.



WARNING

Change your smoke detector /alarm batteries annually or sooner if the device stops working. A smoke detector / alarm with weak or expired batteries cannot be trusted to accurately detect fire or smoke.

■ FIRE AVOIDANCE AND SUPPRESSION

Your coach is equipped with a portable fire extinguisher. Check the charge status (which must be in the green zone) on the extinguisher before each overnight trip, weekly, and annually after the vehicle is placed back into operation following long-term storage. Carefully read the fire-extinguisher instructions before operating your vehicle or the extinguisher, and visit your local fire department for advice on how to properly use a fire extinguisher to safely fight a fire. **The image below depicts a typical coach mounted portable fire extinguisher.**



Fire safety is important while enjoying your coach on the road and while camping, just like at home or at work. Your beautiful luxury coach is a very complex vehicle, constructed of a wide variety of equipment, fabrics, and materials, some of which are combustible. As with any other sophisticated vehicle, the potential for a fire resulting from an equipment failure, wear and tear, damage, or a crash is certainly a possibility. For that reason, you should pay close attention to proper care and maintenance of the vehicle and its specialized equipment and accessories. You must also know how to use the fire extinguisher properly in an emergency. It is small, yet highly effective for a short period of fire fighting. Knowing how to employ it properly will help you protect both life and property in a fire emergency.

Before getting on the road, orient your vehicle occupants and overnight guest companions on the location and procedures to remove the fire extinguisher from its storage cradle. You should never be

the only person in your family who knows how to employ this critical safety device in an emergency. Make sure everyone knows that the extinguisher is a pressurized device that must be pointed away from persons and directly at the base of any fire that needs to be extinguished. When using the extinguisher, it is important to stay a safe distance back from the fire, yet close enough for the extinguishing material to be effective when discharged.

In the event of a fire, every occupant (including pets) must leave the vehicle quickly and safely, using the nearest possible exit. Once outside, everyone should rapidly move clear and seek shelter as far away from the burning vehicle as practical. Call 911 immediately and try to isolate the source of the fire. Consider the severity of the fire before attempting to take action. If possible, use the extinguisher to suppress a small and localized fire until help arrives. If the fire is large, involves fuel, or is not controllable, stay well away from the vehicle and wait for help to arrive.

Should a fire break out while the vehicle is moving, stay calm, remain in control as best possible, and move the vehicle off the road and away from traffic quickly and safely. Bring the vehicle to a complete stop, place it in park and apply the safety brake. Then have everyone exit the vehicle carefully and promptly.

Never allow passengers to re-enter a burning vehicle. The oxygen volume inside the enclosed space will be consumed rapidly, likely causing anyone who enters the coach to become quickly overcome and incapacitated by smoke, heat, and / or flames. For this reason, exiting the vehicle during any fire (no matter how small) is time critical, especially at night if persons are sleeping within the coach when a fire breaks out.



DANGER

This vehicle was manufactured with a wide range of flammable materials and products. A fire could consume oxygen quickly, release large quantities of toxic gasses, high levels of formaldehyde and smoke, causing respiratory distress, suffocation and / or death.



WARNING

Read the directions on your fire extinguisher carefully. Orient regular passengers and family members on its location, removal from storage and proper employment in an emergency. Visit your local fire department for advice on how to safely and effectively use the fire extinguisher.

**WARNING**

Do not smoke in bed or use flammable substances within the vehicle at any time.

■ FORMALDEHYDE AND VENTILATION

Formaldehyde is a naturally occurring organic compound that is widely used in manufacturing lumber, resins, adhesives, carpeting, textiles, upholstery, automobiles, electrical wiring, paint, insulation, and many of the common parts incorporated into your recreational vehicle and your home. Formaldehyde tends to gas off from new products over time and during periods of high temperatures and humidity. In a gaseous form it has a pungent odor and may cause a chemical sensitivity. This phenomena is more noticeable and likely to happen within an enclosed vehicle with poor or low air flow through the passenger compartment.

When formaldehyde gassing off occurs in your coach, it may cause irritation of your eyes, nose, and throat. Other reactions include nausea, headache, and asthma symptoms. Children and people with asthma, allergies, or other respiratory conditions may be prone to a higher incidence of reaction to formaldehyde.

The best way to avoid this situation is to ventilate your coach well before and during each use. Open up the windows and doors, turn on the roof exhaust fan and the roof air conditioner, and allow the coach to air out before heading out on the road. Then set the chassis HVAC controls to provide a steady stream of fresh outside air while traveling and you will enjoy a healthy interior environment.

**WARNING**

Your coach includes materials, fabrics, adhesives and other parts manufactured with a urea-formaldehyde resin and will release small quantities of formaldehyde gas over time. Elevated levels of Formaldehyde gas inside the vehicle may cause temporary eye, nose, throat, or respiratory irritation, and it could aggravate respiratory conditions or allergies.

**WARNING**

Why am I being warned about potential exposure to Formaldehyde? Formaldehyde is a colorless, flammable gas with a strong smell. It is released into the air from a variety of sources. Formaldehyde gas is on the State of California Proposition 65 list as a chemical that causes cancer. Exposure to formaldehyde can cause leukemia and cancers of the nose, throat, and sinuses. Exposure occurs by breathing air that contains formaldehyde. Formaldehyde releases into the air from many sources.





SECTION 5

Before You Go



BEFORE YOU GO

Preparation (accessories / bicycles / luggage / holding tanks / fuel / fluids / food / water)

■ ACCESSORIES

If equipped, ensure all exterior accessories (example: awning, barbecue grills, coolers, kayaks, cargo systems, TV antennas, and satellite dishes) are secured and properly stowed. Do not store any loose items on the exterior of the vehicle, especially on the optional roof rack, ladder, or attached to the rear doors. All accessory items must be fully secured.



WARNING

When operating a coach equipped with the optional roof rack, use care when entering gated lots, garage facilities, and drive-thru lanes at restaurants and banks. Avoid low-hanging cables or tree branches. Observe roof clearance requirements. Contact with overhead obstacles will damage your vehicle and / or cargo, possibly resulting in serious personal injuries.

BICYCLES

There are many hitch-mounted options available to carry bicycles safely on the American Coach Patriot. **When selecting a bicycle rack, you need to consider the following:**

- The number of bikes to be transported
- Access to the rear doors / storage area
- Vehicle, hitch, and tire weight limits

Mount and secure bicycle carriers properly before departing. We do not recommend storing bicycles on the roof of the coach, nor attaching them by any means to the rear doors. Those locations are not suitable for transporting bicycles. The door hinges and shell are not designed to carry a heavy load. Attaching any bike rack or cargo carrying assembly to the rear doors may cause permanent damage, which is not covered under the warranty. Use a trailer hitch mounted bike rack only, provided you factor the weight of the carrier and any mounted bicycles into the total cargo load. Keep in mind the additional weight and surface area of the bicycles may affect the vehicle's overall length and handling characteristics.



WARNING

Prior to driving, secure all items. Unsecured items can shift forcefully causing damage to the vehicle, which could cause sudden loss of control, or serious injuries if not avoided.



WARNING

Do not carry bicycles on the roof of the coach, and never attach any type of bicycle carrier to the rear doors and / or door hinges. The additional weight of bicycles on the hinges and doors could permanently damage them, which is not covered under warranty.

LUGGAGE

One of the most critical aspects of safely operating a touring coach is properly stowing luggage and cargo. The first thing to determine is how much luggage and cargo will be loaded, and then determine whether the items will safely fit within the storage compartments, and in the rear cargo area of the coach. Keep in mind that all cargo, gear, persons, pets, and any supplies must not exceed the maximum cargo capacity of the vehicle, which is specified in the Mercedes-Benz Sprinter Operating Instructions. Determining the weight and placement of luggage and gear is critical to how well your vehicle handles (refer to SECTION 4 - SAFETY).

A good practice is once you have loaded (including fuel and water) your American Coach Patriot weigh the vehicle on a scale. Depending on the type of scale available, you may have the opportunity to weigh each axle of your vehicle. By weighing each axle, that will give you a good idea on how balanced the load distribution is (front to rear). Review your axle weight and tire limits located in your Mercedes-Benz Sprinter Operating Instructions, and become familiar with the Gross Vehicle Weight Rating (GVWR). Once your vehicle is weighed, make sure the total is below the GVWR. Just as important, make sure your load is balanced side-to-side throughout the coach. Failure to maintain a good all-around balance throughout the vehicle may cause the sudden loss of stability, and may also adversely affect braking and handling characteristics. The bottom line is a balanced load enables optimal control of the vehicle and makes driving or towing more relaxing.

HOLDING TANKS

The American Coach Patriot has three separate holding tanks (fresh water, gray, and black). The freshwater tank holds clean potable water that you will utilize from your sink faucets and shower, and if well maintained, the water will be safe to drink. The gray water tank

collects wastewater drainage from the shower and sinks. The black tank will collect all of the toilet waste products and water. Please refer to SECTION 8 – PLUMBING AND SANITATION SYSTEMS of this publication for more detailed information on the fresh gray and black tanks. Representative capacities are listed below for the 170 / 170 EXT and 144 wheelbase chassis.

170 / 170 EXT	Capacity	Full Weight
Fresh Water Tank	32 Gallons	267lbs
Gray Tank	27 Gallons	225lbs
Black Tank	15 Gallons	125lbs
Total	74 Gallons	617lbs

144	Capacity	Full Weight
Fresh Water Tank	28 Gallons	233lbs
Gray Tank	18 Gallons	150lbs
Black Tank	15 Gallons	125lbs
Total	61 Gallons	508lbs

When planning your trip and before departing, always check the levels of water and waste in your holding tanks. It is also wise to take note of how long any fresh water has been stored on board the coach, as it may be prudent to first sanitize and flush the fresh water tank with clean new water before using it for drinking purposes.

Full holding tanks will add weight to your coach which affects fuel economy and the total GVWR. You can reduce or increase the percentage of tank fill based on your load plan, itinerary, and any expected amenities at your destination (such as full water and waste hookups at a camp site). If you expect to have access to full hookups and dumping stations, you may be able to travel with less fresh water on board. However, keep in mind that you will always need enough fresh water on board to flush the toilet while traveling. Minimizing the tank levels will enable you to carry more cargo, and vice versa. If you are getting close to your GVWR be careful to distribute your luggage and cargo as evenly as possible, and always secure the heaviest objects as low as possible in the vehicle.



WARNING

Do not exceed the Gross Vehicle Weight Rating (GVWR). All cargo, gear, bicycles, accessories, luggage, supplies, and holding tank levels count against the maximum cargo carrying capacity of your coach. Exceeding the GVWR is dangerous and could lead to the sudden loss of control and / or a crash.

FUEL

Fill your coach with a quality diesel fuel that meets cetane requirements as specified in the Mercedes-Benz Sprinter Operating Instructions. In severe cold climates, you may want to add a winterizing additive into the fuel fill before topping off with diesel. Such additives are designed to reduce the potential for diesel fuel to gel in extreme cold temperatures. Follow the Mercedes-Benz recommendations at all times to ensure compliance with the warranty. Your coach may also be equipped with the ESPAR Climate Control System's Airtronic forced air furnace, which utilizes the vehicle's internal diesel fuel and electrical power supply to produce heat without idling the vehicle. The advantage of using a diesel heater over Liquid Propane Gas (LPG) is that diesel is a "dry" fuel source, meaning it will not cause moisture to build up inside the vehicle. This heater is quite efficient as it can run under average conditions for approximately 24 hours on one (1) gallon of diesel fuel. Actual fuel consumption will depend upon the interior thermostat temperature setting and outside weather conditions. Be aware that the ESPAR furnace will slowly draw down the coach's fuel tank level over several days, so you may need to fill up before using the heater in a remote area.



NOTE

Your ESPAR cabin heater draws from the same diesel fuel supply as the engine in your coach. Always check the fuel level to ensure you will have sufficient fuel to return from any remote camping area.



WARNING

Diesel fuel is a combustible liquid that can expand or swell in high temperatures. Do not overfill the tank, which could lead to a spill.

FLUIDS

Maintain all chassis related fluids (oil, coolant, windshield washer, power steering, etc.) in accordance with the Mercedes-Benz Sprinter Operating Instructions.

The American Coach Patriot provides three dedicated storage tanks for fresh drinking water, gray water (from the sink drains) and black water (from the toilet). These tanks require routine maintenance as specified in SECTION 8 - PLUMBING AND SANITATION SYSTEMS. Please read that section carefully before operating your coach. Before departing on a trip with your coach, make a daily check of the fluid levels in each tank. This will prevent any inconvenience such as having insufficient fresh water to flush the toilet, or encountering a

situation where the grey or black holding tanks are at too high of a capacity. Keep in mind that full tanks reduce the total cargo carrying capacity of your coach, and also reduces fuel economy because of the additional weight being transported with the vehicle.

Also check to ensure your black tank has an appropriate amount of holding tank treatment before heading out on a trip. This is important to promote a reliable waste system, reduces odors, and helps break down waste so it does not cause a buildup in the tank and is easier to discharge.

■ FOOD

Your food list will not differ too much from your typical grocery list, except it may depend more heavily on non-perishable “dry goods” (Packaged and canned items). Pack non-perishable food items before you leave, then supplement your supply daily with fresh meats, dairy, and produce items as they become available during your trip.

Store dry goods in the pantry cabinet with the heaviest items located on the lower shelves and lighter items higher up in the cabinet. Make sure the cabinet door latches securely.

Keep in mind that temperatures may fluctuate more significantly in your coach than at home. If the vehicle will be left unattended, without the air conditioner or the heater on, food items may spoil more quickly. Wide temperature swings will also cause your coach's refrigerator to work harder. When storing food items long term on your coach, it is best to set the interior temperature control to “AUTO” in a temperature setting range between 68°F and 72°F. This assumes you will be connected to shore power, or powering the heating and cooling system(s) via the chassis engine, the generator, or the batteries.

The refrigerator in your coach will perform similar to the one in your home. Avoid overloading the refrigerator to enhance its efficiency. You should organize your refrigerator so the heaviest items are stored at or near the bottom of the unit, with lighter or delicate items stored closer to the top. RV refrigerators may be somewhat less efficient than a conventional residential refrigerator due to their compact size and construction. Plus they are subjected to a wider range of operating temperatures and conditions. With proper care they will last a very long time. Refer to SECTION 10 – APPLIANCES for specific guidance on the proper use and care of your refrigerator.

Make sure food items and drinks will not slide around while you are in transit. Double check liquid containers to ensure the lids are on tight.

Use extra precautions when storing liquids that could spill easily in transit. Unlike the refrigerator at home, your coach's unit will be subject to constant movement, shaking, and lateral rocking. Airtight plastic containers are a great solution to managing foods that are susceptible to spillage. Make sure the refrigerator door is properly latched to ensure it stays closed in transit. **Some models have an additional door locking tab for this specific purpose. See image below.**



Please read the Domestic Refrigerator Operating Instructions so that you know how to operate the refrigerator safely and correctly. Read the manual in its entirety before operating the unit.



WARNING

If the refrigerator stops cooling, or it emits an ammonia smell, immediately turn the unit off and contact your American Coach Dealership or an authorized Domestic Service Center.



WARNING

Make sure the refrigerator door is securely latched to ensure it stays closed while the vehicle is in motion. If the door is not latched food items could slide out and break on the floor creating a hazard and / or a sudden distraction to the driver, resulting in potential damage to the vehicle's interior or a crash.

■ WATER

Make sure the fresh water is clean and safe to drink before every trip. A variety of drinking water treatment products and in-line filters are commercially available to help you keep your fresh water clean and safe to consume. Use only products specifically designed for this purpose. Do not add bleach to your drinking water as this is an unsafe practice. If your fresh water tank needs to be sanitized, follow the instructions in SECTION 8 – PLUMBING AND SANITATION. Make sure you have a clean freshwater hose to fill your freshwater

tank when you get to your destination. These drinking water ready hoses are readily available in a variety of lengths through your American Coach Dealership and many RV or Marine supply companies. We do not recommend using an ordinary garden hose for this purpose, as some garden hoses may leech compounds into the water. Do not overlook the need to keep your drinking water hose clean and sanitary at all times. Always drain the hose fully before storing it in your coach.

To fill the water tank, or to use city water, connect the hose to the fresh water inlet in the wet bay, and follow the instructions in SECTION 8 – PLUMBING of this manual. The freshwater tank capacity of your coach will vary based on the chassis size (the 144 coach = 28 gallons, and the 170/170EXT coach = 32 gallons). This adds between 233 and 267 pounds of additional weight to your coach when the tank is full. When traveling remotely, this may not be a sufficient amount of water to meet your needs, and there may be some value in bringing along fresh bottled drinking water to increase the total capacity on hand for long trips. If you travel with cases of bottled water, keep them distributed evenly and at the lowest possible location within the vehicle. Keep in mind the previous caution not to exceed the coach's total weight capacity for all cargo, gear, equipment, and fluids.

**NOTE**

Transporting bottled water may increase your total freshwater capacity. However, it must be factored into your coach's total cargo weight.

**DANGER**

Use only commercially produced and approved additives for fresh drinking water. Never add bleach or other cleaning products to your drinking water, which will result in serious physical illness and possible death.

**WARNING**

Do not use an ordinary garden hose to supply water to your coach. Use only hoses certified for use with drinking / potable water. Use of an improper hose may contaminate your coach's drinking water supply and plumbing, resulting in potential serious physical illness.

**WARNING**

Failure to monitor fluid levels and to practice proper freshwater sanitation could lead to equipment failure and / or unhealthy drinking water, resulting in serious physical illness.

■ DRIVING IN DESERT- HEAT/ MOUNTAINOUS TERRAIN / HEAVY TRAFFIC

DESERT-HEAT

Driving in the desert is challenging and it carries additional risks well beyond an ordinary road trip. Motorists must have a plan in place to deal with the extreme environment, potential breakdowns, and water or fuel shortages. You should also be prepared to face and handle two of the most dangerous desert-related road hazards: flash floods and dust or sandstorms. Your American Coach Patriot is capable of performing well in desert environments, which can range from extremely high daytime to cold nighttime temperatures. However, the desert environment poses some significant dangers and risks. If you are operating in very remote desert areas, those risks are amplified by the reduced potential for immediate assistance (especially emergency roadside or medical support).

Always perform a careful inspection of your coach's key functional systems prior to any trip through a desert location. Pay particular attention to the engine oil level and the mileage driven since the last oil change. Desert conditions warrant a more frequent service interval than ordinary driving. This advice also applies to your coach's LP generator (if equipped), which is air cooled and may be subject to extremely high loads and operating temperatures.

Check your engine coolant level and top it off to the required specification level stated in your Mercedes-Benz Sprinter Operating Instructions. If your coolant level is low, be sure to inspect the engine for possible coolant leaks. Check the condition of your tires and consider bringing along a spare. When camping in the desert, tire covers are also a good idea to reduce the harsh effects of extreme heat and sun on the tires. Refer to SECTION 4 – SAFETY.

Check the operation of your air conditioners (both the chassis and the roof mounted unit). This is a good time to replace the cabin air filter on the chassis and to make certain the air filter on the roof air conditioner is free of dust and lint. If they are not blowing cold air adequately, you may also want to having them inspected for refrigerant leaks or debris in the heat exchanger. Make certain both units are fully functional

before traveling in high temperature areas. Similarly, desert areas are known for their ability to become very cold at night. Therefore, check your cabin heater to ensure it is operating properly.

Let someone know when you will be traveling through or camping in a desert area. Provide them with your route plan and how they can reach you in the event of an emergency. Check with state websites and / or highway officials to learn about any potential delays or road closures along your planned desert route. Before leaving for your destination, check the weather reports to determine whether storms are predicted along the route you will be taking.

Never get caught in the desert without water, food, and medical supplies. Pack your coach with plenty of water, snacks, necessary medications, and safety gear to last multiple days. Bring along emergency flares, a first-aid kit, and some basic tools to handle minor emergencies and repairs. Start each morning with a routine check of your vehicle and surroundings. If you suspect you may have a problem with a key component of your coach, you should consider leaving the desert area at the first and safest opportunity for better conditions to resolve the issue.

When driving in the desert, avoid deep or shifting sand. Tires at full pressure will easily dig into the sand and may cause your vehicle to become stuck. If this happens, you may temporarily reduce the tire pressure on both the front and rear wheels to increase the footprint of each tire. Attempt to back out first, but do not allow the tires and wheels to spin, as that will only make your situation worse. Once you are freed from the sand, re-inflate the tires to their normal pressure settings before driving at highway speeds.

Desert driving brings other unique hazards, such as flash flooding and oil slick road surfaces when it does rain. Never attempt to ford through fast moving water during a desert rainstorm, as even a few inches can destabilize your coach. Another hazard is sudden dust or sand storms, which can quickly reduce visibility and damage the engine and roof air conditioner in your coach by clogging their air intakes and / or filters.

**NOTE**

Operating your coach in a desert environment may warrant a more frequent engine oil and generator service schedule due the extreme temperatures and sand / dust conditions.

**DANGER**

Desert driving conditions may be extremely hazardous, requiring special preparation and expert driving skills. During rainstorms, mudslides may occur, and oils and other contaminants on wet roadways may cause hazardous driving conditions. This could lead to the sudden loss of control of your vehicle, and result in a crash, damage to your coach, and serious injuries or death.

**DANGER**

Torrential rains in the desert may cause high levels of water to accumulate in dry riverbeds or canyons. Desert sands are slow to absorb water, these normally dry channels suddenly become powerful rivers that travel so rapidly they can flood remote areas that have not even received rain. Always avoid fast-moving water that could overcome your vehicle.

**DANGER**

Sand and / or dust storms are common in the desert. The size of these storms can span vast distances and altitudes. The high winds associated with these storms may exceed 60 miles per hour. Sand and dust storms may rapidly decrease the driver's visibility to zero. If practical, carefully exit the highway or trail immediately, shut down your coach's engine, and seek shelter until the storm passes.

MOUNTAINOUS TERRAIN

Before a trip through mountainous terrain, ensure your American Coach Patriot is in optimal operating condition, as unexpected events, steep long grades, and weather may place a more demanding load on your vehicle. Mountain driving places a greater strain on the chassis cooling system, braking system, and the transmission, especially if you are carrying heavy loads or towing a trailer.

Ensure the vehicle's coolant, brake and transmission fluid levels, and tire pressures are at the proper levels and comply with the specifications listed in the Mercedes Benz Sprinter Operating Instructions. Check to ensure the proper operation of the brakes, heating and cooling, windshield wipers, batteries, and the exhaust system. Also, inspect the tires for wear to ensure they are suitable for driving on snow and in icy conditions.

Consider the possibility of additional fuel consumption when traveling through mountainous terrain. Higher altitudes and climbing up steep grades will require more fuel than typical level road driving conditions.

Additionally, fuel stations and cell phone service may be spotty or limited in mountainous areas. Many mountain roads have minimal shoulders and restricted forward visibility. Running out of fuel under those conditions will place you at serious risk of a collision with other vehicles passing by on the road. You can avoid this situation by planning ahead to ensure your American Coach Patriot is completely fueled before entering mountainous or desolate areas. While it is important to plan for adequate fuel, you should never transport any type of portable fuel containers inside the coach.

If you will be towing a trailer, it is especially important to consider the potential need for brakes on your trailer. Trailers that are not equipped with brakes can become a serious safety hazard as they will “push” the tow vehicle when traveling down steep grades, which can lead to the sudden loss of control or the inability to stop the tow vehicle / trailer combination. Take particular note of any steep grade warning signs as you transit mountainous roads. Before towing in mountainous terrain, visit a local Mercedes-Benz Sprinter Dealership or an American Coach Dealership for assistance with setting up an electronic brake controller if your trailer is equipped with electric brakes.

Use a controlled braking strategy. Continuous braking down steep grades can quickly overheat your brakes. This leads to a dangerous condition known as “brake fading”, where gasses build up between the brake rotors and the friction material on the brake pads. To avoid this, use the brake tapping method (where you lightly and frequently step on the brake pedal and then release it) to keep them cool. If you smell a metallic burning odor coming from the brakes, or see smoke coming from the wheels, you should find a place to safely pull over to allow your brakes sufficient time to cool off. Many long mountain passages have rest areas specifically for this purpose. Pay attention to the speed limit, and try to anticipate steep, hairpin turns by braking to a controlled speed prior to the turn. By braking before turns, you shift some of the forces to the rear of the vehicle, which offers greater control, and the ability to easily coast through winding roads.

For even better braking assistance and control on steep declines, downshift into a lower gear. This will limit stress on your vehicle's brakes by using the engine and transmission to help you control your speed. Plan ahead and downshift before you begin going down steep hills, as changing gears while you are descending a steep grade can be dangerous.

When driving in mountainous terrain at high altitudes you may notice a loss of horsepower because the air is thinner than at sea level.

However, your Mercedes-Benz 3.0 turbocharged diesel engine should be able to handle most mountainous terrain. Please read the Driving Tips Section of your Mercedes-Benz Sprinter Operating Instructions for more specific advice on braking with loads, general braking, downhill gradients, driving in winter, and driving off-road.

While climbing a steep hill or mountain pass, be sure to monitor your engine temperature gauge and stay within the safe operating temperatures as specified in your Mercedes-Benz Sprinter Operating Instructions. Do not rush or “push” your coach to transition steep hills more rapidly than necessary. This is especially important if you are towing a trailer, since high heat could permanently damage your coach's transmission.

If you see the engine temperature rise above an acceptable level, turn off the air conditioner and go lighter on the accelerator. You may want to pull over where it is safe to allow the engine to cool. Provided you are not losing coolant, do not immediately shut off the engine, but rather allow the engine to idle for a while until it cools down to normal operating temperature. Shutting down the engine before it has an opportunity to cool down may permanently damage the turbocharger. As the engine cools down to a normal operating temperature it will shed high heat through the exhaust system. Under those conditions, avoid parking or stopping over grassy areas that could spontaneously ignite from the extreme high temperatures of the vehicle's exhaust system.

Be prepared for roadside emergencies or sudden inclement weather. Weather changes can occur rapidly in the mountains. A good practice is to tell a friend or family member where your destination is, and when you plan to arrive there. Note that cellular service may be spotty or unavailable in remote and mountainous areas. Make sure you pack extra food, water, clothing, first aid, and tools to correct any minor problems in case roadside assistance is not immediately available.



WARNING

On long, steep mountainous grades monitor braking carefully. Avoid harsh or sudden braking and downshift as you approach steep grades, which will reduce the strain on your coach's braking system. Overheating your brakes can lead to “brake fade”, a dangerous condition that reduces the ability to slow your vehicle, possibly leading to sudden loss of control, the inability to stop and / or a crash.

**WARNING**

If your engine overheats pull off the road to a safe location and allow it to cool down. If you are not losing coolant, let the engine idle until the temperature returns to the normal range. Do not park over grassy areas as the hot exhaust could cause a spontaneous fire.

HEAVY TRAFFIC

Rush hour driving may cause you to use your brakes more often and more quickly than you would on a normal drive. This overuse can also cause premature wear of your coach's brakes. Plan ahead to avoid heavy traffic conditions, which will reduce wear on your coach.

Have your brakes inspected if your coach pulls to one side when applying the brakes, or if you hear a grinding sound. If you frequently drive in heavy traffic, your brakes will be prone to higher wear and potential damage. A Mercedes-Benz Dealership authorized to service Sprinter vans can inspect and repair the brakes on your coach.

Excessive idling in stop-and-go traffic causes deposits in your engine, which can increase wear on critical engine parts. If you drive frequently in heavy traffic, refer to the Special Service Requirements section of your Mercedes-Benz Sprinter Operating Instructions. The Mercedes-Benz ASSYST PLUS service interval display will provide information on the remaining time before the next service due date. However, under more arduous operating conditions, you should have the interior air filter, engine air cleaner, engine oil and filter changed more frequently. Consult the service department at your Mercedes-Benz Sprinter Dealership for more information on this.

Avoid aggressive driving at all times, especially in heavy traffic. Pushing your coach hard will cause unnecessary stress and wear to various critical parts, which will eventually degrade your coach's performance and reliability. **You can improve your heavy traffic driving experience by practicing the following habits:**

- Turn off or silence your phone, and eliminate any other distractions
- Scan the road for poor road conditions, distracted drivers, and aggressive drivers
- Always signal before turning or changing lanes
- Operate the coach at a constant speed
- Remain calm and avoid reacting to other drivers who may become impatient

Leverage the high technology safety features integrated into your coach. ATTENTION ASSIST, Active Distance Assist DISTRONIC, and Active Lane Keeping Assist are excellent safety features that reduce driver fatigue, promote a safer journey, and will make the trip more enjoyable.

Avoid heavy traffic by planning ahead. This will save you time and you will consume less fuel. Sometimes it is best to simply wait for heavy traffic to subside. You might even try to enjoy the road less traveled and take full advantage of the excellent comfort and convenience features of your luxury Class B coach.

**WARNING**

Maintain a proper distance between vehicles ahead, to the side, and rear of your coach while driving in heavy traffic. Stay alert and avoid being surprised when drivers ahead brake suddenly. Without proper distance and a slow reaction, the chances for an accident increase with the possibility of damaging your vehicle.

■ SPECIAL CONDITIONS (CROSSWIND / SNOW & ICE / RAIN)**CROSSWIND**

Driving in high wind conditions can be both physically and mentally exhausting. To alleviate the strains of driving in windy conditions, ensure you slow down, and drive at a safe speed to arrive safely to your destination. Keeping both hands on the wheel will allow for greater control and a quicker response for vehicle corrections. Be sure to take additional breaks. Driving in bad weather and high winds can be exhausting. Your Sprinter's tall profile may make driving in cross-winds more challenging at times. You can avoid driver fatigue by simply pulling off the road and relaxing for a while in your coach. And always activate the full suite of Mercedes-Benz safety features in your Sprinter, which are controlled through the dashboard multifunction display.

When dealing with crosswinds another factor to take into consideration is the wind generated by vehicles as they pass you, especially large and heavy trucks. The wind pressure wave generated ahead and to the side of a big rig or another recreational vehicle is enough to push your coach off course. When passing, or being passed by a large vehicle maintain a firm grip on the steering wheel and be prepared to adjust.

Highway overpasses can also be a challenge during windy conditions. Wind accelerates through the underside of overpasses and may

create what is known as the venturi effect, where wind velocity increases through the confined space beneath the overpass. Be prepared for this to avoid overcorrecting as you pass through or clear a tight space under windy conditions.

When parking with strong crosswind conditions, the best practice is to position the American Coach Patriot into the wind whenever possible to minimize your exposed surface area. This will make an overnight stay in your coach more pleasant. It will also reduce the sound of the wind rushing around and over your coach.

**DANGER**

While driving in windy conditions, be alert for roadside objects that might suddenly blow into your path, such as trash cans, branches, or trees. Reduce speed to increase reaction time. Give large and heavy vehicles additional space when passing or following. Avoid sudden maneuvers in a cross wind, which could lead to loss of vehicle control, resulting in serious injuries or death.

SNOW & ICE

Before heading out, the most important thing to do is make sure your American Coach Patriot, yourself, and your passengers are ready for the harsh conditions of winter travel. Your coach is designed, built, and insulated to take on cold weather and winter travel conditions, but with certain limitations. It is not a true four-season coach, and the plumbing system must be winterized during periods where temperatures will drop below the freezing level. Please refer to important information on this in SECTION 12 – WINTERIZATION AND STORAGE. All other systems are fully functional during winter months.

A great start to winter driving is to understand the on and off road performance limitations of your American Coach Patriot. Understanding your own driving abilities, and how well you are prepared to handle the vehicle in a wintry mix of ice, snow, and slush will relieve a lot of driving stress and anxiety. It is also extremely important to keep in

mind that your coach is rather heavy, and that may translate into both advantages and disadvantages on ice and snow. The extra weight increases ground pressure, which may assist in getting the vehicle moving on snow. At the same time however, the additional weight and mass will be more difficult to stop, especially on icy roads.

When traveling during winter, especially in areas prone to heavy accumulations of snow and ice, it is a good practice to carry winter recovery gear, tow straps, shackles, a shovel, and tire chains (where allowable or required by law). We do not recommend driving extended distances with tire chains installed as they may damage the PVD wheels, the exterior running boards, and / or the finish of the coach. Tire chains should only be used in emergency situations.

If your coach becomes disabled on ice or snow, be extremely careful with how the vehicle is recovered. The only acceptable point from which to use a tow strap or chain is from the rear trailer hitch safety chain loops or via a ring mount style hitch draw bar fixed to the trailer hitch assembly. The vehicle may be pulled from the rear by securing a tow strap and slowly pulling from behind the vehicle with a suitable recovery vehicle or tow truck. Never attempt to use a tow strap on any portion of the front end of the coach, as this will damage the spoiler / air dam, and or the suspension components. Front end recovery requires a specially equipped tow truck capable of lifting the front end by raising the front wheels.

Remove all snow and ice from the windshield and hood of your coach. If possible, carefully remove accumulated snow from the roof of the coach as well. Use extra care not to damage any roof mounted vents, antennas, solar panels or other equipment when clearing snow off the roof. In many states, it is illegal to drive with snow on top of the vehicle, because there is a possibility of the snow and ice blowing off and creating a dangerous situation for other motorists.

If you reside in a warm climate and plan to travel to a cold climate area, consider winterizing your plumbing system and holding tanks, and make sure that your windshield washer fluid is rated to below freezing temperatures. All season tires are required by most northern states as well. A visit to your local Mercedes-Benz Sprinter Service Department or American Coach Dealership in advance of travel to cold weather areas is advisable. They will ensure your coach is ready.

Check the condition and performance of your vehicle batteries prior to winter travels. Make sure they are fully charged and in good working condition before your trip. Take note of the total capacity and



any charging limitations of your batteries, especially if your coach is equipped with LiFePO4 (Lithium) batteries. The Battery Management System (BMS) on Lithium batteries prevents charging below a preset temperature to prevent permanent damage to the batteries. Refer to SECTION 9 – ELECTRICAL of this publication for additional information on specific battery types, charging, and their limitations.

Pack plenty of provisions (bottled water, extra food, and cold weather clothing) in case you are delayed or become disabled in extreme cold temperatures. Fuel up more frequently to avoid being low on fuel if you are somehow delayed on an interstate highway for a long period of time due to bad weather, or traffic. Remember your diesel fuel tank also services the coach's ESPAR furnace. If you find yourself in a remote area waiting for the weather to clear, your diesel heater will be important for your comfort.

Plan more frequent rest periods because driving on snow and ice can be stressful. Rest stops are also a great opportunity to refuel your vehicle, and to clean the windshield and parking / radar sensors on the front bumper of any snow and / or ice accumulation. If you decide to remain in your coach overnight in a snowy location, make sure your heater and generator exhaust are both unobstructed by drifting snow to prevent any possible buildup of Carbon Monoxide (CO) Gas beneath or around the coach.

**DANGER**

Black ice is a nearly transparent thin coating of glaze ice on a road surface, which may be extremely difficult to see. If you encounter black ice, reduce your speed by coasting or lightly applying the brakes, and turn on your hazard flashers to warn anyone following you. Your coach is equipped with antilock brakes. Apply light even pressure and do not "pump" the brakes to reduce your speed. Heavy or sudden braking may result in immediate loss of control, resulting in a crash and possible serious injuries or death.

RAIN

Your coach is designed to handle average rainy conditions without any difficulty. **Please take the additional precautions listed below when driving or camping during rainy conditions:**

- Inspect tires for adequate tread depth
- Inspect windshield wipers before traveling
- Reduce speed to avoid hydroplaning

- Turn on your windshield wipers
- Ensure your headlamps are on while driving
- Increase the frequency of rest stops during long trips in bad weather
- Fully retract your awning if you are camping and expect inclement weather

**DANGER**

When light rain mixes with oil residue on the road surface, it creates a slippery condition that may cause your coach to hydroplane. Follow Mercedes-Benz Operator's Manual guidelines for proper tire maintenance and slow down to allow the tire channels and grooves to shed water more effectively. Hydroplaning may result in a sudden loss of control, causing a crash and /or serious injuries and / or death.

■ PARKING

The American Coach Patriot is equipped with Mercedes-Benz PARKTRONIC Parking Assist with is a very helpful feature. Please refer to the various parking sections of to the Mercedes-Benz Sprinter Operating Instructions for detailed instructions on how to use this important feature, and how to correctly apply the parking brake.

To reduce the risk of personal injury or damage to your coach, and to relieve weight and strain on the power train always perform the follow steps:

- Keep your foot on the brake pedal until you set the manual parking brake
- Check the instrument cluster to ensure the parking brake indicator is on
- Set the gear selector to "P" Park mode
- Check the instrument cluster to confirm that the vehicle is in Park mode
- If you are towing a trailer, place a wheel chock on the downhill side of each left and right trailer tire
- Turn off the engine

In tight parking situations it is best to have an assistant watching from outside the vehicle to help guide you into place. That person must be visible to the driver at all times. Be aware of overhead obstacles while parking to avoid tree limbs and power lines. Please read all of SECTION 4 – SAFETY for additional information and parking precautions.



DANGER

Always verify that the parking brake is set and the vehicle is in the Park mode before exiting the coach. Failure to verify that the transmission is in park with the parking brake set could allow the vehicle to move or roll away, leading to property damage and resulting in serious injuries and / or death.

■ FUEL REQUIREMENTS (DIESEL / PROPANE)

DIESEL

Before departing, refer to the Mercedes-Benz Sprinter Operating Instructions for specific fuel requirements. Your Mercedes-Benz 3.0 diesel operates on Ultra - Low Sulfur Diesel. Take note of the restrictions on the use of Bio-Diesel, to avoid potential damage to your diesel's fuel delivery, emissions, and exhaust systems, which could also void the engine warranty. Careful use of winterizing additives may help your coach perform better during operations under extreme low temperature conditions. Before using fuel additives, refer to the Operating Instructions, or consult your local Mercedes-Benz Service Department for advice on their proper use.



NOTE

The fuel requirements are listed directly above the fill / cap assembly on your coach. **See image below.**



DANGER

Apply the parking brake, set the coach in Park mode and turn off the engine and generator (if equipped) before refueling. Wear rubber gloves. Do not smoke or allow other ignition sources near the refueling area. Report spills to the fuel station attendants. Failure to follow refueling safety procedures could result in a fire and explosion, causing property loss and serious injuries or death.



WARNING

Only use commercially available ULTRALOW SULFUR DIESEL FUEL (ULSD, 15 ppm MAXIMUM SULFUR) that meets the ASTM D975 standard. Failure to use ULTRA-LOW SULFUR DIESEL FUEL (ULSD) can severely damage the vehicle's exhaust gas after treatment system.



WARNING

Mercedes-Benz USA approves the use of B5 (ULSD with a maximum of up to five percent by volume biodiesel). Pure biodiesel and diesel fuels that have a higher percentage of biodiesel, e.g. B20, can damage the fuel system and the engine and are therefore not approved.



WARNING

Use care not to pump gasoline into your diesel-powered coach by mistake. Gasoline will seriously damage the engine. Diesel fuel pumps are color coded green to distinguish them from a gasoline pump. The minimum Cetane level is posted on the fuel pump.

PROPANE

Your coach may be equipped with a remote fill 15.1-gallon Liquid Propane Gas (LPG) tank, which supplies fuel to the Suburban Advantage Tankless, Continuous Water Heater and the optional Onan Generator (if equipped). The heater uses a 60,000 BTU 2-Stage Modulating Combustion System (MCS) which adjusts the LPG gas input to provide a consistent and endless supply of hot water to meet your needs. The 13,500 BTU Roof Top air-conditioning unit has the ability to run using electrical power created by the Onan Generator. The water heater and the generator (if equipped) share the supply of Liquid Propane Gas (LPG). If you operate a barbecue grill or other outdoor LPG appliance via the remote connection located at the rear passenger side of the coach, it will also consume fuel from the onboard tank.

The total amount of Liquid Propane Gas (LPG) consumed will vary based on your use of the water heater, how long you power the air-conditioning system or charge the coach's batteries with the generator, and how often you operate other appliances using the onboard LPG supply. You should always check the Liquid Propane Gas (LPG) tank level prior to traveling.

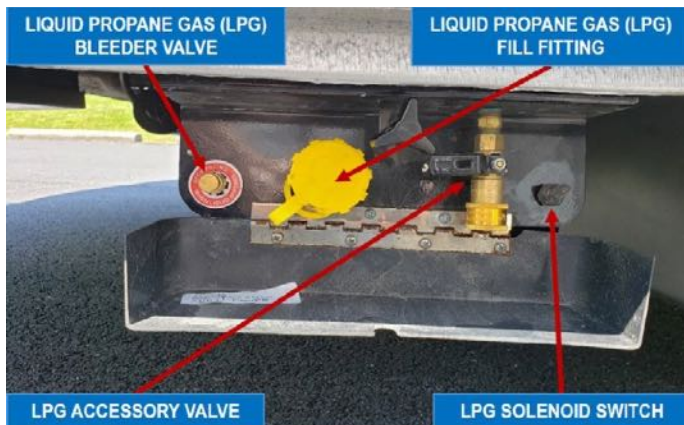


NOTE

The Liquid Propane Gas (LPG) tank provides fuel to operate the coach's hot water heater, optional generator, and other appliances connected to the remote supply valve. Always check the fuel level to ensure you will have sufficient Liquid Propane Gas (LPG) before traveling or visiting a remote camping area.

Liquid Propane Gas (LPG) is readily available throughout the country. Before traveling long distances or camping, ensure your LPG tank is filled up to but not beyond 80% capacity.

When refilling the LPG tank follow the guidelines listed in SECTION 4 – SAFETY. Make sure your coach engine, and all power driven equipment (such as the optional generator) are turned off prior to refilling the tank. ***Below is an image of the propane filling port and accessory valve location:***



Never fill the tank with natural gas, which is incompatible with your generator or any other propane powered equipment. Use only high quality filtered Liquid Propane Gas (LPG) from a trustworthy source.



DANGER

Never fill the Liquid Propane Gas (LPG) tank beyond 80% capacity. Excess filling can cause uncontrolled gas flow to appliances.



WARNING

Never substitute natural gas for Liquid Propane Gas (LPG). They are incompatible.

PRE-DEPARTURE / SAFETY CHECKLIST

EXTERIOR PRE-DEPARTURE CHECKLIST

Step	Location / Component	Status	Notes
1	Check tires condition and pressures		
2	Close remote LPG valve		
3	Ensure all exterior hoses and power cords are disconnected and stowed		
4	Secure any remote TV antennas or satellite dishes		
5	Secure external carriers and cargo		
6	Close and lock all external doors		
7	If storing cargo on roof, check security of items, their weight, and clearance		
8	Ensure all exterior driving lights are operational		
9	Fully retract the awning		
10	Check vehicle ride height, and retract leveling stabilizers (if equipped)		

INTERIOR PRE-DEPARTURE CHECKLIST

Step	Location / Component	Status	Notes
1	Ensure cargo is placed into cabinets with the heaviest items in the lowest positions. Secure items so they do not move while driving		
2	Turn off the fresh water pump for traveling and when not in use		
3	Close and latch the refrigerator door		
4	Stow the portable table and pedestal		
5	Secure the sink and cooktop covers		
6	Secure all items off counter tops		
7	Secure bathroom doors, loose items, and drain the toilet		
8	Configure lighting for travel		
9	Configure the driver's seat and ensure easy access to all driver buttons, switches, and controls		
10	Check the function of all seatbelts, and ensure all passengers have them on		
11	Clear the area around the brake and accelerator pedal for anything that could be an obstruction		
12	Adjust all mirrors, ensure all views through the windows are unobstructed		
13	If traveling with small children, check to make sure all federally approved restraint devices are secured		





SECTION 6

Exterior Features and Care



EXTERIOR FEATURES AND CARE

The exterior of your American Coach Patriot is the product of combining the Mercedes-Benz Sprinter Van with specialized additional features and equipment, which bring the vehicle to a high level of sophistication, capability, and style.

Beneath your coach's refined exterior lies a powerful, rugged, and reliable chassis that will deliver many years of confident ownership with basic care and routine maintenance. To get the most out of this great combination of form and function, please read the Maintenance and Care section of your Mercedes-Benz Sprinter Operating Instructions. Please read and follow the additional procedures outlined below to protect your investment, and to promote an optimal experience with the exterior features of your luxury Class B coach.

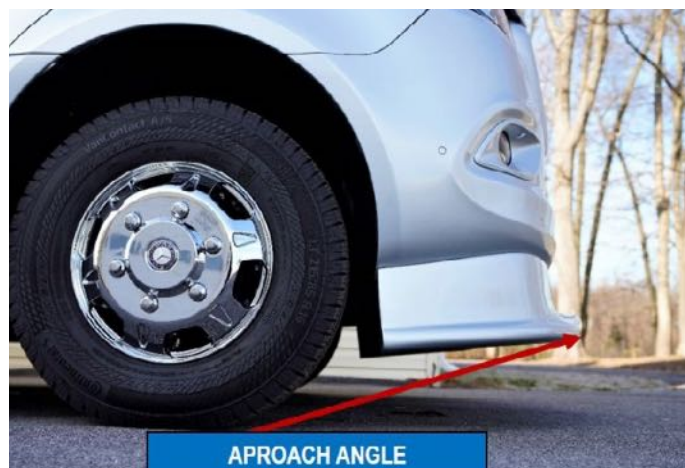
■ BODY MOLDINGS, FOG LAMPS, RUNNING BOARDS, COURTESY LIGHTS

Your American Coach Patriot is no ordinary Sprinter Van. As you have already noticed, it is equipped with customized body accessories to aid in entry and exit from the vehicle, promote safety, reduce noise, and enhance the exterior functionality and appearance of the coach.

The body accent moldings, running boards, and front spoiler (if so equipped) are manufactured from composite, plastic, or fiberglass materials that were coated with a matching base-coat / clear-coat paint finish, which is quite durable, but not indestructible. Without routine care, those components will deteriorate over time, especially when exposed continuously to bright sunlight, road salts, moisture, and other pollutants. When you wash and wax your coach, gently clean these body accents and be certain to apply a high quality automotive wax to protect them (at least twice annually) to promote their longevity.

If your coach is equipped with the optional front spoiler with fog lamps, you must take extra care to prevent damaging it when parking, and when transitioning to and from road surfaces on a steep approach angle. The front spoiler helps to reduce airflow beneath the vehicle, which greatly reduces road noise and improves fuel efficiency. "Bottoming out" the front spoiler can seriously damage it, or ruin the finish. All 2021 model rear-wheel drive coaches have a minimum clearance of 9.5 inches between the bottom edge of the front spoiler and a level road surface. 2021 Four wheel drive coaches have a 12-inch road clearance between the front spoiler and a level road surface.

The image below depicts the approach angle of a rear-wheel drive American Coach Patriot equipped with the optional spoiler.



The front spoiler may be equipped with fog / driving lamps (Part # 88194 Model 2500 Light Kit) to aid in nighttime driving visibility. These supplemental lights are controlled through the Firefly network display located at the driver's seat position in the front of the coach. They activate by touching the "Fog" icon via the touch screen main display page. You may also activate them via the lighting page on the master Firefly display located near the sliding side door entrance. These fog / driving lamps will not automatically turn on or off when you manipulate the vehicle's headlamp control. Failure to turn off the fog / driving lamps without the engine, or generator running, or while disconnected from shore power, could drain your coach's house battery if they are left on. **Below is an image of the optional fog / driving lamp.**



Each fog / driving lamp is illuminated by a high intensity halogen bulb, which is accessed from the backside of the spoiler / air dam assembly. To replace the H3 55-watt halogen bulb, carefully remove the two screws at the back of the housing and gently pull the bulb socket from the fog lamp bulb housing.

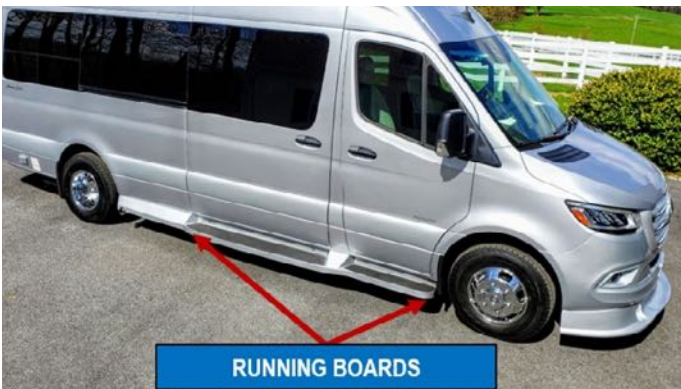

WARNING

Turn off power and allow the bulb to cool before attempting to change the halogen bulb in the fog / driving lamp housing. Halogen bulbs operate at very high temperatures and failure to allow the bulb to cool before removal could result in painful burns or other injuries.


NOTE

The optional fog / driving lamps are not connected to the Sprinter chassis' headlamp controls. They will not turn on or off with the vehicles headlamps. Failure to turn off the fog / driving lamps via the Firefly display without the vehicle running, without the optional generator running, or when disconnected from shore power could drain the "house" battery on the coach.

Your coach is equipped with running boards and integrated LED courtesy lights at the side sliding door entry. These components were fabricated from fiberglass, with reinforcing steel brackets and cross members beneath the coach. The running boards have a non-skid surface to aid in safe entry and exit from the vehicle. Note the ground clearance between the bottom edge of the running boards and the flat road surface. Keep in mind that negotiating undulating terrain, speed bumps, and other raised obstacles could damage these structures.


DANGER

Never allow any person to stand on the running board(s) with the vehicle in gear or in motion. Standing on the running board(s) of a moving vehicle will result in severe injury or death of persons if not avoided.

■ ACCESS HATCHES AND FITTINGS

A variety of specialized equipment and accessories are installed on your American Coach Patriot and some of those items have exterior access hatches and / or fittings to enable their functions. It is important to keep those access points, vents, and hatches clean and free of debris to ensure their associated equipment functions properly.

The roof of your coach has a powered ventilation hatch that opens from inside the vehicle. This hatch is part of the FanTastic Roof Fan® assembly, which requires cleaning at least every 6 months from the outside to prevent it from binding. After gently washing the coach roof with a good quality car wash shampoo, rinse the roof area, and allow the roof to dry. Then apply a good quality car wax to the outer shell of the fan's roof hatch. This will help protect it from deterioration and to shed dust and water quickly. Open the hatch from inside the vehicle, and then use a dampened microfiber towel to gently clean the hatch gasket and the hatch's hinge area of any dirt accumulation. Do not use excessive water to clean the gasket, which will damage the ceiling inside the coach. Allow the gasket to dry completely, and apply a light silicone lubricant to the seal before closing the hatch. Without this lubricant, the hatch may become difficult to open as the seal will eventually stick to the hatch lid.



Clean the hatch screen using a vacuum to gently remove any lint or dirt trapped in the screen. You can also wipe the screen clean with a dampened lint-free microfiber towel, and then let it dry.


WARNING

Never attempt to force a stuck roof hatch open by prying on it, as this could cause the plastic hatch cover to suddenly break, causing serious injuries. Regular cleaning and lubrication of the hatch seal is required to prevent it from binding or becoming stuck, which could damage the hatch motor.



WARNING

Use care when cleaning the hatch seal and the internal cavity. Do not use excessive quantities of water, as this could cause water damage inside the coach. Use a **lightly dampened** microfiber towel and allow the unit to dry completely before lubricating the seal and closing it.

A wet bay access hatch(s) is located on the driver's side of the coach just forward of the rear axle. The wet bay hatch(s) provide service entry for the coach's fresh water fill, black and gray tank valves, tank flush connections, macerator pump control and hose reel (if equipped), and the exterior shower. The hatch(s) are secured with two twist-locking latches located at opposite ends of each hatch. Both latches must be turned to open the hatch.

When cleaning this compartment, do not use high-pressure water as it could damage any electrical switches and / or force debris into the macerator hose reel assembly. Use a soft microfiber towel with car wash shampoo to gently loosen and remove any dirt and / or debris that has accumulated in the compartment. Wipe all surfaces dry with a clean microfiber towel and allow the compartment to air out completely before securing the hatch. Periodically apply a good quality automotive wax to the inside of the hatch to protect the finish. Apply a thin coating of light oil annually to the hinge / latch assemblies to prevent binding and corrosion. **Below is an image of a wet bay compartment with the macerator hose reel and gate valve switches**



WARNING

Do not use high-pressure water to clean the wet bay compartment, especially if your coach has the optional macerator pump and hose reel assembly. High-pressure water could damage the electrical switch components or force debris into the hose reel assembly.

■ SCREEN DOORS (SLIDING SIDE AND REAR PULL DOWN)

The American Coach Patriot is equipped with both a sliding screen side door and a rear pull down screen that completely covers the rear storage area of the vehicle with either or both doors open. This arrangement provides for exceptional fresh air flow throughout the coach.

The sliding screen door may be open or closed with the outer side door in either the open or closed position. To open the sliding side screen door from outside of the coach, slide the door towards the rear of the coach by grasping the handle on the right leading edge of the door. The screen door should slide easily towards the rear of the coach. If it does not move easily, check to make sure no object(s) are leaning against the screen door or obstructing its path.



SIDE SCREEN DOOR HANDLE



NOTE

The sliding side screen door may be in the open or closed position with the outer door opened or closed as well. Should the screen door resist opening, check to ensure nothing is leaning against it, or has fallen between the screen door and the step well area. Keep the sliding door track free of dust and debris to ensure trouble free operation.

The sliding screen door also has a convenient spring loaded and hinged access hatch at the forward bottom edge of the door. This facilitates the attachment of a pet tether to the steel swivel ring located at the lower right corner of the door post between the sliding side entry door and the front passenger seat. This feature allows your pet to be securely tethered to the coach with the screen door open or closed (See images below).



Never operate the power sliding door with your pet tethered, or leave your pet unattended. Do not close the outer door with the tether attached to the swivel ring, as this could damage the door seal or jam the outer door. When not in use, detach and store your pet's tether to prevent a potential tripping hazard at the side entry door.



WARNING

Never operate the power sliding door with a pet secured via a tether to the interior swivel ring. Always ensure your pet has adequate shade and water when tethered to your coach. Never leave your tethered pet unattended, which could lead to possible entanglement, serious injury or death.

The rear door screen is a pull down arrangement similar in design and operation to a typical home window shade. Simply grasp the bottom edge of the screen assembly and gently pull it straight down until the bottom edge is flush with the coach floor. To raise the screen back up, pull slightly down again, and then allow the spring tensioned roller to retract the screen. Use care not to snag any objects that might be stored in the rear of the coach to prevent damaging the screen fabric. Below is an image of the rear door screen in the lowered position.



Gently vacuum and wipe down the sliding side and rear door screens with a dampened lint-free microfiber towel. Vacuum the sliding door track as well to keep it from binding. Do not put excessive pressure on the sliding door screen, as the screen fabric may dislodge from its seat. A torn side door screen is easily replaceable, since the fabric is available at most hardware stores. Your nearest American Coach dealership can also replace a damaged screen for you.

■ WINDOWS AND SCREENS

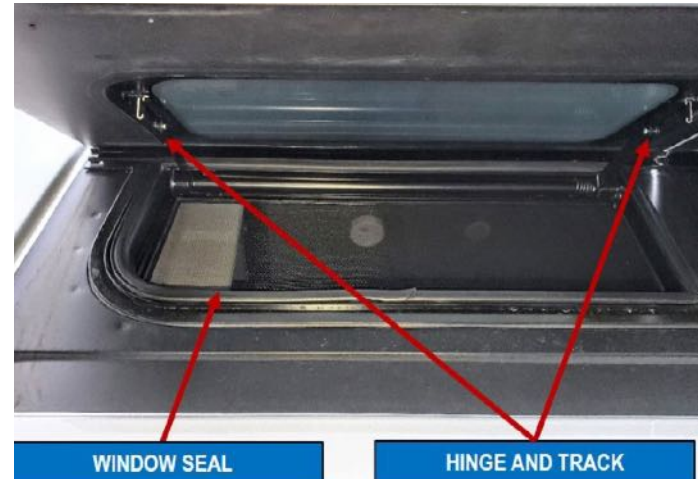
Open all coach side tilt out or sliding windows and clean them both inside and out at least every 6 months to prevent them from binding. Use a dampened microfiber towel to gently clean the window seals, sliding window tracks, and the hinge area of tilt out windows of any dirt and dust accumulation. Clean the body panels similarly, which will help prevent black streaks from forming on the coach body below the windows. Do not use excessive water to clean the window gaskets and sliding tracks, which could damage the interior of the coach. Allow the gaskets to dry completely, and apply a light silicone lubricant to the seals before closing the windows. Without this lubricant, the windows may become difficult to open as the seals could eventually stick to the window glass. Apply a drop of light oil to each hinge point / track assembly of the tilt out windows, and cycle each window open and closed to work the oil into the hinge and track. Wipe away any excess oil to prevent it from attracting dirt.

The sliding rear window rides on an internal window frame track. Gently clean the seal around the frame with the window in the open position. Always ensure the window is fully closed when not in use. Unlike coaches equipped with the tilt out windows, the sliding window should never be left open in the rain as water may enter the coach, which will damage the interior. **Below is an image of the sliding rear window.**



In the unlikely event that a window binds or becomes stuck closed and will not open, do not attempt to force it. Too much pressure could damage the window assembly or break the glass. You might also permanently damage the window seal, which will cause it to leak. Contact the nearest American Coach Dealership service department for assistance.

Below is an image of a typical tilt out window.



Clean your window screens at least every 6 months or sooner as necessary. Open each window and use a vacuum with a soft brush to gently remove any lint or dirt from the screens. Do not press firmly on the window screen to avoid damaging it. Alternatively, you may use a damp microfiber cloth to gently wipe away any lint or dirt that has accumulated on the screens. Allow the screens to dry thoroughly after cleaning to avoid mold or mildew from occurring. These same procedures may also be used on sliding windows to keep them clean and operating well.



WARNING

Never force a stuck window to open by prying or applying pressure to the glass which may shatter, causing serious injuries. Clean and lubricate window seals and tracks regularly. In the event you are unable to open a window, visit the nearest American Coach dealership to have a qualified service technician open it for you.

■ ROOF MOUNTED OPTIONS AND ACCESSORIES

A number of important options and accessories are mounted to the roof of your coach. This includes, components such as the roof air conditioning unit, digital TV antenna, solar panel(s), AM/FM antenna, cargo rack assembly, and other options that may have been dealer installed (example, digital satellite antenna). It is important to inspect and clean these items regularly. **The image on the next page depicts typical roof mounted accessories and components such as vents, TV antenna, awning, and air conditioner.**



Do not allow leaves, pine needles, insects, dirt, or other debris to accumulate on the roof of your coach. They will damage the painted finish over time, and could impede the proper operation of the equipment, such as the roof air conditioning unit (which has a heat exchanger located behind the exterior cowling). Inspecting the roof air conditioner at the beginning of each season is very important, since insects sometimes build nests inside of the cowling, which can greatly reduce the efficiency of the unit. You can gently vacuum away debris from the openings in the roof air conditioner cowling. Read the instructions for your specific unit first, and contact your authorized American Coach dealership for assistance or service if you are not comfortable with completing this maintenance task.

Inspect the roof of your coach before each overnight trip, weekly, and annually if the vehicle has been in long term storage. Pay close attention to the sealant around any mountings, and hatches to ensure it has not cracked. If there are signs of cracking in the sealant, it should be addressed at the first opportunity to prevent potential water damage to the coach.

Do not attempt to add additional equipment to the roof of your coach. Any additional or replacement components should be installed by an authorized American Coach Dealership to avoid any conflict with warranty coverage. Adding additional gear or equipment to the roof of your vehicle reduces its total cargo capacity and will raise the coach's center of gravity (refer to SECTION 4 - SAFETY).



WARNING

Installing additional equipment to the roof of your coach reduces its total cargo capacity, raises the center of gravity, and any resulting damage is not covered under warranty. Consult an authorized American Coach Dealership before attempting any modifications to your coach. A higher center of gravity will reduce stability, causing unsafe conditions that could cause a roll-over crash.

■ WASHING, WAXING, AND POLISHING

The exterior finish on your American Coach Patriot is a high gloss multi-layer paint coating designed to last many years with routine care and maintenance. It is a base-coat / clear-coat design that is common to the vast majority of automobiles and luxury coaches produced today. Unless your coach was special ordered with a unique color combination or coating, the exterior finish was applied when your Sprinter chassis was manufactured by Mercedes-Benz. Some components (such as the front fascia, spoiler, and body accent moldings) match the Mercedes-Benz finish, and were painted and installed during the coach assembly process. The base-coat / clear-coat process was also applied those body accent features. This process assures you of a long lasting and beautiful luxury Class B coach, provided you regularly wash the exterior to remove any contaminants, and routinely polish and wax the finish.

Avoid acid-based cleaning products or those containing bleach to wash your coach. Do not use products that contain a pumice or polishing compound. These products can permanently damage the finish on both the body and your coach's wheels. Clean your tires and wheels using a product specifically designed for this purpose, which is available at most major auto parts retailers. Rinse the tires and wheels first, then wash them, and rinse completely again.

Your coach is equipped with Physical Vapor Deposition (PVD) coated wheels. PVD coatings are available in many colors, so whether the wheels on your coach have a polished chrome or a black finish, the coating process is the same. PVD coating provides a very hard, durable, and beautiful finish, but it is not immune to damage. As noted above, acid-based cleaners will etch the surface, permanently degrading the finish (which is not covered under the warranty). After cleaning your tires and wheels with a mild detergent, rinse them well. Then dry the wheels immediately to prevent water spots from forming.

When they are completely dry, apply a coat of high quality car wax to protect the PVD finish and promote a brilliant shine. However, do not apply wax to satin or matte finished wheels, as they will develop a chalky appearance after the wax dries. **Below is an example of a PVD coated polished chrome wheel.**



WARNING

Never clean your coach exterior, tires, or wheels with an acid-based or abrasive cleaning product. Use only acid-free car wash products that do not contain wax suspended in the solution. Damage to the body finish, tires, and wheels caused by harmful cleaning products is not covered by your Mercedes-Benz or American Coach warranty(s).

■ TRAILER HITCH AND CONNECTOR

A trailer hitch with 2-inch receiver and a 7-pin electrical connector are permanently mounted to the rear of your coach directly beneath the rear bumper assembly. Please refer to the Trailer Operation section of your Mercedes-Benz Sprinter Operating Instructions before attempting to connect and / or tow a trailer or vehicle with your coach. Pay close attention to the maximum Gross Trailer Weight (GTW), Gross Combined Weight Rating (GCWR), and the Gross Axle Weight Rating (GAWR) before towing. Also note the limitation of the trailer draw bar nose weight and ball, which must not exceed the rating listed on the ball, hitch assembly, or identification plate.

Use of load leveling, sway control, and weight distribution devices may help your Sprinter tow a trailer better, but they do not increase its load or towing capacity. Such devices only assist with distributing weight fore and aft across the tow vehicle and trailer combination. They also help to reduce side-to-side sway while towing.

Exceeding any of the rating values noted above could create dangerous operating conditions and possibly damage your vehicle. It could also lead to the sudden loss of control and a crash. Please refer to the Towing portion of SECTION 4 - SAFETY of this manual before attempting to tow any trailer or vehicle with your coach.

After coupling a trailer to the hitch ball assembly, make sure the coupling is latched. Install the coupling safety pin or a suitable coupling lock to prevent the trailer from separating from the draw bar and ball assembly. Then attach the trailer safety cables /chains to the mounting loops on either side of the hitch draw bar. Do not tow without these important safety devices installed.

Connect the trailer's lighting and braking system to your coach using the 7-pin wiring harness located on the driver's side of the hitch. Use care to match the keyed cable end to the connector socket, then firmly press and seat the plug into the connector. At this point your trailer is properly connected to your coach.

Start your vehicle, turn on the headlamps, and perform a walk around inspection to ensure all running and tail lights are fully functional on both the coach and the trailer. Then turn on the signal flashers to verify that the turn signal lamps properly illuminate on the trailer. Lastly, have someone apply the coach brakes and check to ensure the trailer brake lights illuminate.

■ SPARE TIRE MOUNT (IF EQUIPPED)

A spare tire mount may be attached to the rear of your coach using the trailer hitch receiver located at the rear of your vehicle. Do not attach any tire carriers or similar accessories directly to the door, or by using the door hinges for that purpose. Doing so will void your warranty.

■ ROOF RACK (IF EQUIPPED)

Your coach may be equipped with the optional roof rack assembly. This high-quality aluminum rack provides excellent support for lightweight items that may be secured with appropriate tie down straps and nets directly to the roof rack. Never store items in excess of 100 pounds total weight on top of the rack. Do not place rack mounted items on top of the solar panels or close along the sides of the air conditioning unit. Items placed over the solar panels will degrade their performance, and may crack the glass. All items should be distributed onto the rack evenly and as low as possible. Anything placed on the rack will increase the total height of the vehicle, and may cause issues with reduced overhead clearance under overpasses, trees, and other overhead obstacles.

Items secured on the roof rack must be well secured. The roof rack is accessed via the attached ladder (**see image below**).



The Freestyle awning will provide many years of service with routine maintenance. It is powered by 12 volts of electricity through the coach's house battery and may be operated from the main Firefly display, or the driver's display. In the event of a complete loss of power, it may also be retracted manually. Before operating the awning, please take the time to read the entire Carefree Freestyle Owner's Instructions.

With the vehicle in park on a level surface, and the engine off, you may extend the awning by pressing the EXT button on the Firefly display. Before extending it, make sure there are no obstructions that might come into contact with the awning, such as tree branches, utility wires, other vehicles, etc. To stop the awning from extending, press and release the EXT button again. To retract it, press the RET button. To interrupt the retraction, press the RET button again.

The awning will not operate if the driver's display has a red lock indicator on the display, check to ensure the vehicle's transmission is in park, the engine is off, and that the brake is properly set. This is a safety feature integrated into the Firefly display, which will not allow you to extend the awning if the engine is running or in drive mode.

■ POWER AWNING

The optional Carefree Freestyle motorized roof awning provides excellent shelter from the sun and light rain. The integrated Direct Response™ system will retract the awning automatically under windy conditions. It should never be extended while moving the vehicle for any reason. Always check to ensure it is in the fully closed / stored position before driving.



The awning is locked when the red lock icon is displayed (**see image below**).



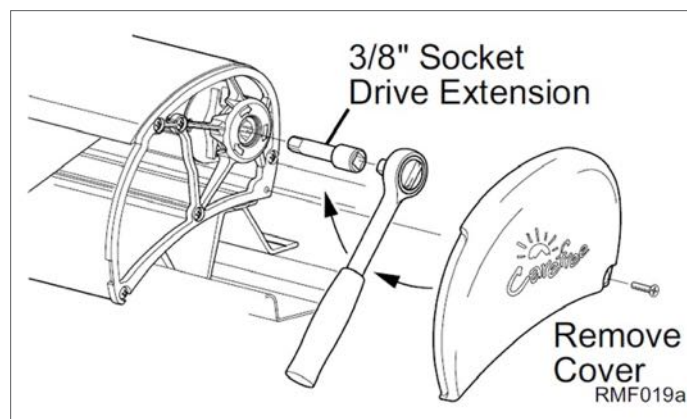
Your awning is equipped with LED lighting. To turn on the LED light strip, open the illumination page on your Firefly display and touch the awning button. To turn the light off, touch the button again. Always turn off the lights whenever the awning is not in use to enhance longevity.



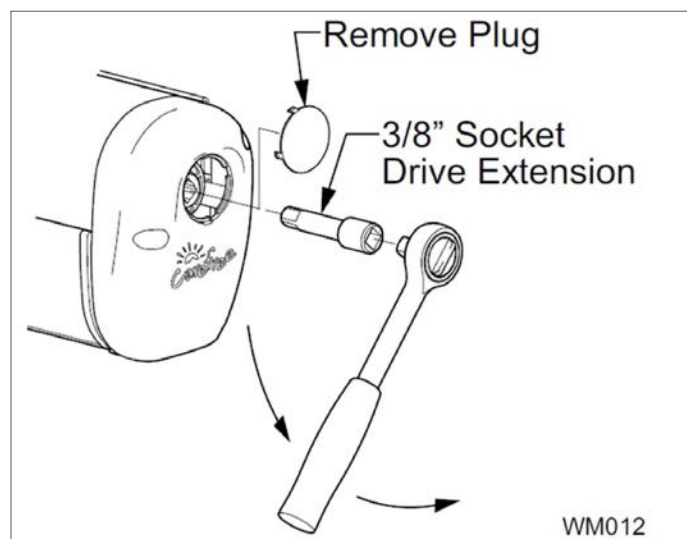
One of the beneficial features of the Freestyle awning is the lack of vertical supports. The unit is lightweight and only requires the two retracting arms to support the lightweight cover. Do not hang anything from the awning, however, as the additional weight could damage the assembly. The pitch of the awning, which is the angle at which it extends outward and slightly downward from the side of the coach, may also be adjusted. Refer to the Freestyle Owner's Manual for additional information how to adjust the pitch.

To maximize the longevity of the Freestyle awning take the time to periodically clean the fabric with a gentle natural soap. For best results, a simple rinse with clean water each month will help extend the time between more vigorous cleanings. Do not use any detergents, oil based products, or abrasive cleaners to remove stains, as they will permanently damage the fabric. Do not use extremely hot water (above 100°F), and never apply heat in an effort to dry the fabric more rapidly. Allow the fabric to air dry fully before retracting it. This will reduce the potential for mold or mildew forming on the fabric. A few drops of light oil applied to the awning support arm hinge points will promote smooth operation of the unit. Do not apply a heavy amount of oil, and wipe any excess off with a clean lint-free microfiber cloth. After applying the oil, extend and retract the awning a few times to work the oil into the hinges. With a light coating of oil on the microfiber towel, wipe along the inside top edge of the awning housing to remove any accumulated dirt. Keep the housing clear of any leaves or pine needles that may have been pulled in by the awning as it was retracted.

Should your awning not retract under its own power, it is possible to operate it manually. On most coaches where the awning is directly attached to the roof of the coach, this requires a Phillips head screwdriver to remove the forward (right hand) end cover, and a 3/8" socket extension with ratchet assembly. Before attempting this procedure, make sure power to the awning is turned off. With the end cap removed, the 3/8" inch drive extension may be inserted into the square drive hole at the end of the awning. Rotating the ratchet and drive extension clockwise will retract the awning. **See image below from the Freestyle Owner's Manual.**



Your awning may also be mounted directly to the optional roof rack assembly. For a rack mounted awning, the manual retracting process is the same. However, you access the square drive hole through a plug in the end cover. Insert the 3/8" drive extension through the cover opening and into the square drive hole. Then proceed to retract the awning with the ratchet. See the image below from the Freestyle Owner's Manual.





WARNING

The Freestyle Awning can expose you to chemicals including Di-isodecyl phthalate (DIDP), Vinyl Chloride and Formaldehyde, which are known to the state of California to cause cancer or birth defects or other reproductive harm.



WARNING

Risk of fire. Keep all sources of heat and flame away from the awning canopy. Never place an open flame heater or fire pit beneath or adjacent to the extended awning. Make sure any campfire hot embers and / or ash will not land on top of the extended awning, as this could cause a fire leading to serious injury or death. The awning fabric is not fireproof or flame retardant.



WARNING

Pay close attention to weather conditions when using the awning. Do not attempt to extend the awning during periods of high winds and heavy rain. Such conditions could seriously damage the awning and possibly cause serious injuries to anyone beneath or close to the extended awning. Fully retract the awning if high winds or extended periods of rain are forecast, or if you expect to be away from your coach for any length of time.

■ FOUR CAMERA SYSTEM

Your coach may be equipped with the optional all-around four-camera system. The main control display will be located on the front dashboard near the left side of driver's position. This system enables the driver to maintain optimal situational awareness of the coach's surroundings at any time. All four cameras may be viewed simultaneously, or independently at the driver's discretion. Use the touch screen display to switch to select the desired camera view.



See image below of the four-camera system display.

The four-camera system provides a front, side, and rear view regardless of whether the vehicle is stationary or moving. The four independent cameras are positioned in the front center lower portion of the grill / fascia, on each of the forward left and right fenders, and directly above the rear doors. The image below depicts the



passenger side fender mounted camera location.



NOTE

The image quality of the four-camera system is directly affected by the cleanliness of each individual camera lens. Clean each camera lens periodically with a clean and lightly dampened lint free microfiber towel.

To turn on the four-camera system, press the power button on the lower right corner of the display. This will activate the display. Once powered up, you can use the MODE button to toggle between single and multiple camera displays.



NOTE

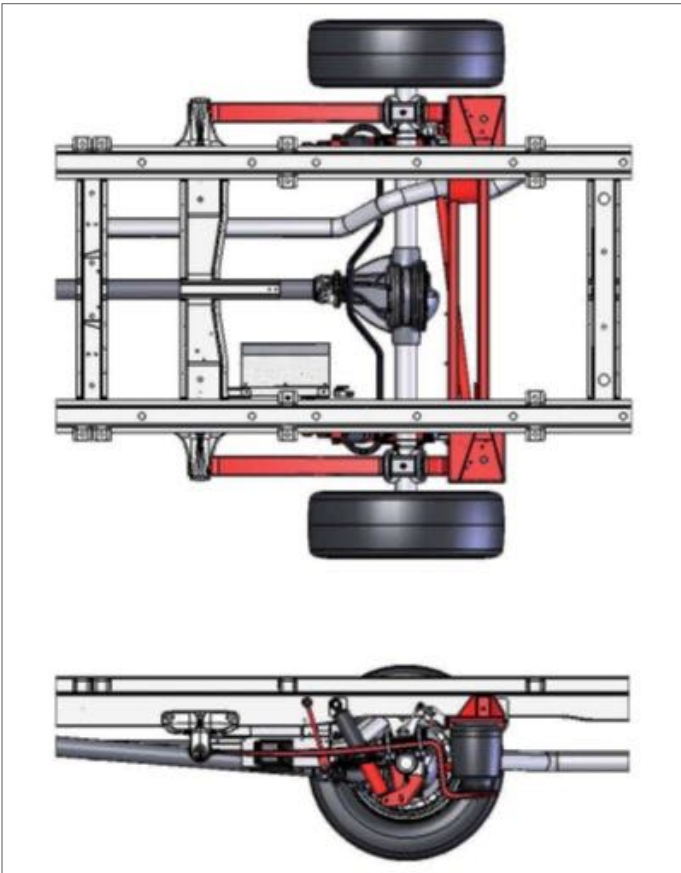
Always turn off the four-camera display when the vehicle is not in use, or whenever it is placed in long-term storage, to eliminate a power draw on the coach's battery.

■ VB AIR RIDE SUSPENSION SYSTEM

Your coach may be equipped with the optional VB Air Ride Suspension System, which aids in leveling the coach and improving its ride quality. The system utilizes pneumatic (air bag) suspension components on the rear axle in lieu of the standard leaf spring only suspension. The system increases comfort, stability, drivability, and delivers a constant ride height.

VB Air Ride is a factory installed option that places a driver-adjustable air bag at the trailing end of a specially designed leaf spring on each side of the rear axle. The air pressure in each air bag is adjusted

automatically, or via a remote control located at the driver's seat. The system will automatically adjust the ride height of the rear axle to maintain a constant level position both laterally and longitudinally as you are driving. The system monitors any changes in the chassis' pitch and roll orientation to as you drive to aid in keeping the vehicle level and at a consistent ride height at all times. It will make necessary chassis ride height adjustments regardless of the load or the vehicle's center of gravity. It will not make the vehicle safer to operate should the coach be overloaded, or if stowed luggage, cargo, and equipment are improperly distributed and balanced within the coach by the operator.



The VB Air Ride Suspension utilizes the following components, which are installed on the rear axle:

1. A height sensor fitted between the body and the axle on both sides of the vehicle. These sensors measure the ride height of the vehicle;
2. The air compressor and Air Suspension Control Units (ASCU), which takes the inputs from the height sensors and the remote control to make adjust rear axle height on both sides; and,

3. Air springs which are inflated or deflated based on the ASCU's analysis of the pre-programmed baseline ride height of the vehicle versus the current ride height, and the desired ride height settings.
4. The remote control allows manual adjustments to the rear chassis, and will only function while the vehicle is parked.
Refer to the image below and follow these steps to operate the remote.

STEP 1

Start the coach and the "Check" light (1) on the remote control will illuminate, indicating the system is active. If there is an error or problem with the system, the "Check" light will flash and generate a beeping tone. If this occurs, please contact your authorized American Coach dealership for assistance.

STEP 2

With the engine running, and the vehicle in park with the safety brake on, you may use the "Up / Down" buttons (2 and 3) on the remote to raise or lower the rear of the vehicle. This is useful when attempting to make minor ride height adjustments to level the coach at a campsite.

STEP 3

Establish the desired ride height per Step 2 above. Then save desired manual ride setting to either of the two memory buttons by pressing and holding the desired memory button (6 or 7) on the remote control.

STEP 4

To temporarily deactivate the system, press the "Service" button (8), which will illuminate. Once illuminated the system is off, which is necessary when having service work performed on the chassis. Touching the button again will turn the system back on.

STEP 5

To return the vehicle to ride height while it is stationary and parked, press and hold the "Front / Rear" button (5) until you hear a beep. The system will then attempt to adjust the air suspension to achieve the desired ride height.

When activating the system or increasing the ride height, the electric air compressor may start. Decreasing the ride height may cause a hissing sound, which is air being released from the system. These are normal sounds.



DANGER

Never activate the VB Air Ride system while passengers are entering or exiting the vehicle. Never reach between the suspension components and the body with the system on. Make sure all persons are clear of the coach when activating the system as sudden chassis movements could cause serious physical injuries and / or death.



WARNING

If the air compressor on your VB Air Ride System operates continuously or more frequently than normal, have the vehicle inspected at the earliest opportunity. An air suspension component may be leaking, which could result in excessive electrical loads placed on the battery, loss of functionality, and reduced vehicle stability. A damaged or leaking air suspension component could lead to loss of vehicle control, resulting in a crash, serious physical injuries and / or death.

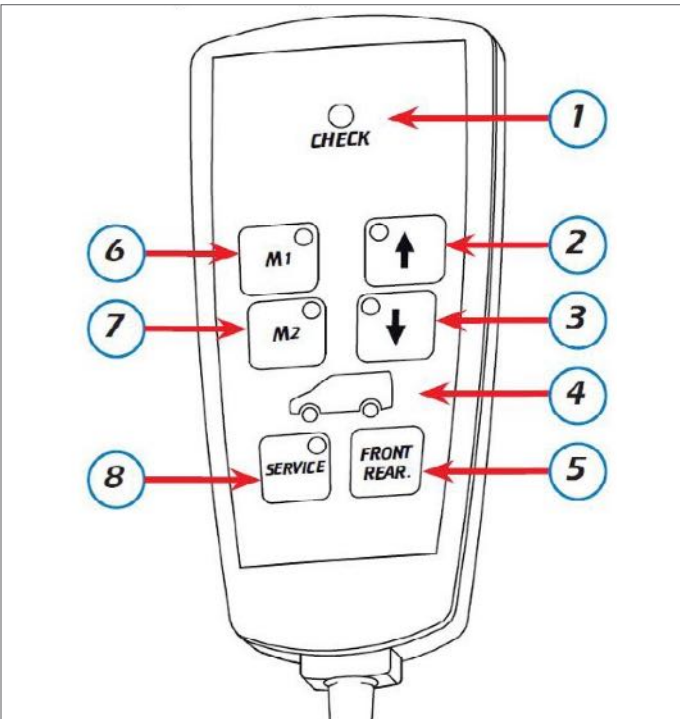
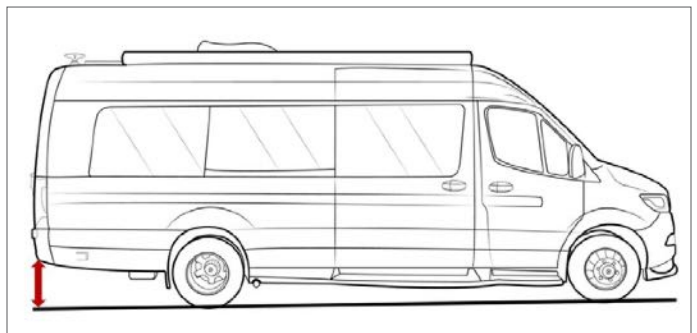
Do not modify the vehicle's suspension to increase or alter ride height (example: installing an aftermarket suspension lift kit). Modifications to the suspension will void the VB Air Ride System's warranty and could result in unsafe driving conditions.



DANGER

Modifying the vehicle's suspension system by installing non-standard aftermarket suspension components may severely damage the VB Air Ride System, causing sudden loss of control and a crash, resulting in serious physical injuries and / or death.

If you discover your coach is leaning, or the rear of the vehicle is sagging while sitting still and the engine is turned off, this could be a result of the following: a change in the cargo load after the air suspension system was turned off; ambient temperature changes; small air-leaks in the system; or, the system is attempting to compensate for minor tolerances in the automatic ride height system. These are minor temporary conditions that may cause leaning up to about a centimeter. Any leaning condition will normally self-correct after you turn on the ignition and start the coach. For additional assistance or system troubleshooting, please refer to the VB Air Suspension User Manual or contact your American Coach dealership for assistance.



NOTE

The VB Air Ride System only adjusts the rear axle. It will not change front axle ride height. This system is relatively maintenance free. It should be inspected by a qualified VB Air Ride technician annually to ensure reliable, safe, and proper operation of the system.

The VB Air Ride System relies upon an air compressor to provide and maintain pressure to the air bag suspension components. This compressor will turn on whenever the system needs to be pressurized, which may occur even when the Mercedes-Benz 3.0 turbo diesel engine is not running. The compressor operates off the 12-volt house battery bank and draws approximately 26 amps when running. When the compressor runs it will generate a unique sound. Do not be alarmed as this is normal. However, the compressor should not turn on and run continuously without stopping.

**NOTE**

Check ride height by measuring the distance from the rear bumper to the ground. Avoid sagging / squatting at the rear of the coach.

**WARNING**

If the coach does not return to a level ride-height condition within one minute of starting the engine, and within 24 hours of last being operated, have the system inspected. This could indicate a potential air leak in the system. Do not drive the coach if it is leaning or the rear of the vehicle is sagging. Operating the coach in this manner, or with a faulty air suspension system component is dangerous, and it could seriously damage the VB Air Ride System or the vehicle.



SECTION 7

Interior Features, Functions, and Care



INTERIOR FEATURES, FUNCTIONS, AND CARE

The American Coach Patriot interior combines an array of special equipment and appliances with the Mercedes-Benz Sprinter Van to deliver a high level of comfort, capability, and functionality.

The luxurious interior combines refined upholstery, cabinetry, equipment, and appliances designed to deliver many years of enjoyment with basic care and routine maintenance. Please read this section carefully along with the Mercedes-Benz Sprinter Operating Instructions. The procedures outlined below are intended to supplement (but do not replace) the owner's / operator's manuals associated with the interior equipment and appliances installed within your vehicle. This section will help you to setup and operate your coach. It will also help you to protect your investment and promote an optimal ownership experience with your luxury Class B coach.



NOTE

The procedures outlined in this section are representative of the typical coach layout, to include an array of features and equipment that accompany a wide range of models. Your vehicle may not have all or some features covered in this section. The equipment and appliances described and depicted may also be different from those originally installed in your coach, as product enhancements and changes are made over time.

If you cannot find the information needed to safely operate your coach, if an appliance is not covered herein, or you require assistance with a specific function, please contact our Customer Service and Warranty Department at (574) 522-4878. A product technical advisor will provide you with assistance directly.



WARNING

A potential exposure risk exists to formaldehyde gas, which is contained in the furniture products used within this vehicle. Formaldehyde gas may cause leukemia and cancers of the nose, throat and sinuses. Over time it may slowly leech out of furniture and other products used to assemble this vehicle, especially under high temperatures. Refer to California Proposition 65 for additional information on Formaldehyde gas exposure risks at: <https://www.p65warnings.ca.gov>

■ INTERIOR SEATING

Your coach is equipped with a combination of fixed, swivel, and reclining seats which are designed to offer functionality and comfort. The premium quality seating fabrics consist of either the standard AMG or the optional SLS Double Needle Diamond Pattern. Care and maintenance of both fabrics is the same, with the optional SLS upholstery offering higher comfort and durability.

When driving your coach, all seating must be in a fully upright (non-reclined) and forward-facing position. All seated occupants must face towards the front of the vehicle and be properly restrained using the seat belts.



DANGER

Operating the coach with the vehicle seats in any position other than locked in the forward-facing and upright position can lead to potential serious physical injuries or death.

■ CHILD SAFETY SEATS

Child safety seats may NOT be installed on the rear bench seat as it lacks the required safety tether or shoulder restraint for proper installation. Install a child safety seat in either the second row of seats (applies to the MD4 coach only) or in the front passenger seat. Follow the procedures in the Child Seat section of the Mercedes-Benz Sprinter Operating Instructions for the proper installation of a child safety seat, along with the associated passenger air-bag safety precautions.



DANGER

Do not install a child safety seat on the rear bench seat, which lacks the required safety tether / three point harness to securely attach the device to the rear seat. Installing a child safety seat on the rear bench seat may lead to serious physical injuries and / or death.

■ SWIVELING & RECLINING FRONT SEATS

Both the driver's and passenger's front seats may be swiveled (rotated) to face 50°outward, 50°inward, or 180° rearward when your coach is parked. These seats should never be in any position other than forward facing and fully upright whenever the vehicle is in motion. Please refer to the Seats and Stowage section of the Mercedes-Benz Sprinter Operating Instructions for this procedure and additional safety warnings.

To rotate the seats to face inwards or towards the rear of the coach follow these steps:

- STEP 1** Ensure the seatbacks are fully upright. Reclined seats will be difficult or impossible to rotate as the seatback may make contact with the side of the vehicle.
- STEP 2** Grasp the seat lock release lever, which is located at the center front of the seat bottom. Move the lever towards the center of the vehicle to release it from the locked position.
- STEP 3** Rotate the seat, which may be positioned 50° inwards or outwards, or 180° inwards to face the rear of the coach.
- STEP 4** Release the locking lever and make sure the seat has locked in the desired position.



Before attempting to drive the vehicle, make sure all seats (front and rear) have been returned to the forward facing and upright position. Check to ensure each seat is securely latched and facing forward

before moving the vehicle. Adjust the seats, head restraints, steering wheel and mirror before moving the coach. Seatbelts must also be fastened before moving the vehicle.



DANGER

Never attempt to rotate the seats with the vehicle in motion. All seats must be locked in the forward facing and upright position whenever the vehicle is in motion. Failure to lock seats in the forward facing and upright position increases the risk of serious physical injuries and / or death.



WARNING

Do not adjust seats, head restraints, seatbelts, or the mirrors while the vehicle is in motion, which could result in serious physical injuries or loss of vehicle control, resulting in a crash.

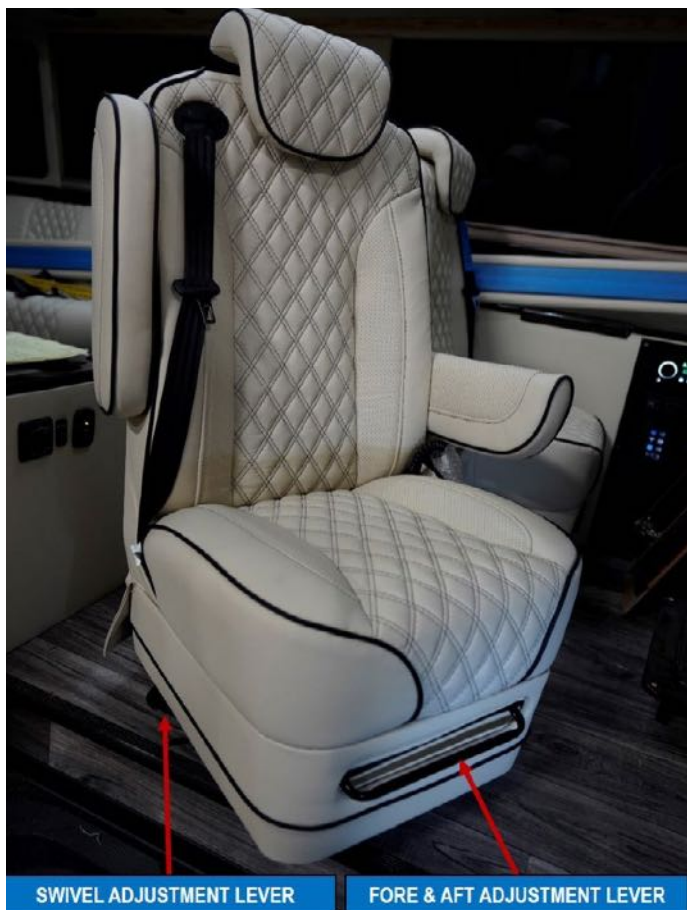
■ REMOVABLE SEATING

Your coach may include the optional adjustable and removable second row swivel and fore-aft sliding seats. To adjust the seat fore and aft, grasp the horizontal lever at the center lower front of the seat and lift upwards. While holding the bar upwards, slide the seat to the desired position, then release the adjustment bar to lock the seat in place. Check to ensure the seat is firmly locked in place before moving the vehicle.

A child safety seat may be used with the coach's removable seating. However, the removable seat must be locked in the fully upright and forward-facing position to properly mount a child safety seat. Do not operate the vehicle with a child safety seat mounted in the removable seats in any other position. Refer to the CHILD SAFETY SEATS paragraph above and the Child Seat section of the Mercedes-Benz Sprinter Operating Instructions.

To swivel the optional adjustable second-row seats, grasp the adjustment lever on the bottom right side of the seat and move the lever to release the seat lock. While holding the lever in the released position, swivel the seat to the desired position and then release the handle to lock it in place. Never operate or move the vehicle with the seat occupied in any position other than facing straight forward.

To recline the seats, lift up on the lever located on the lower left side of the seat and gently lay the seat backwards. Never operate the vehicle with the seats in the reclined position.



The second row of seats are also removable. To remove the seat. Lift up on the locking lever, which is located on the bottom right side of the seat. Rotate the seat forward to remove it. **See image below.**



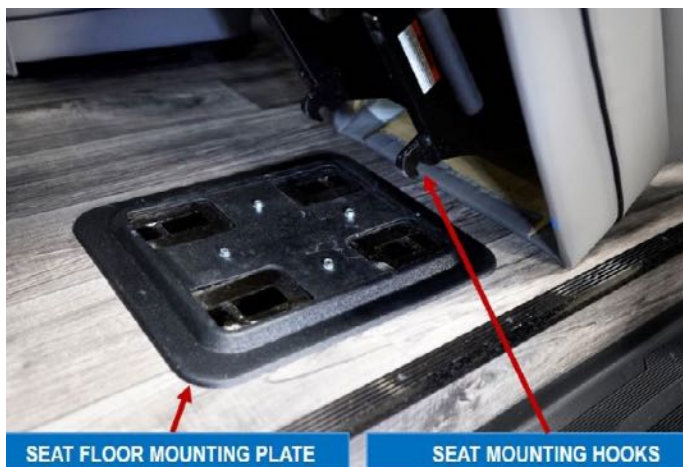
To reattach the removable seats, follow these procedures:

- STEP 1** Position the seat facing forward and directly above the steel floor mounting plate.
- STEP 2** Tilt the seat slightly forward and guide the two front steel seat hooks into the corresponding holes / slots in the steel floor plate. The mounting teeth must fully engage the front edge of the forward holes in the floor plate.
- STEP 3** Reconnect the optional massage function's electrical plug (if equipped). Plug the white plastic connectors together. Then route the wire assembly so it will not be trapped or pinched between the seat frame and the floor mounting plate once the seat is lowered.
- STEP 4** While maintaining forward pressure to ensure the front pair of teeth remain engaged with the floor plate, carefully rotate the seat downwards to the floor. Gently lift and hold the seat release handle to raise the rear pair of seat latching hooks as you lower the seat. This will allow the seat to make complete contact with the floor mounting plate.
- STEP 5** Allow the seat release handle to return to its normal position and firmly press down on the seat cushion to ensure the rear set of hooks have fully engaged with the floor mounting plate. Check to ensure the seat is sitting level and is locked firmly into the floor mounting plate by attempting to pull the seatback upward and forward to confirm that the entire seat assembly has locked in place. If the seat rolls forward and / or raises up off the floor plate it is not secure.

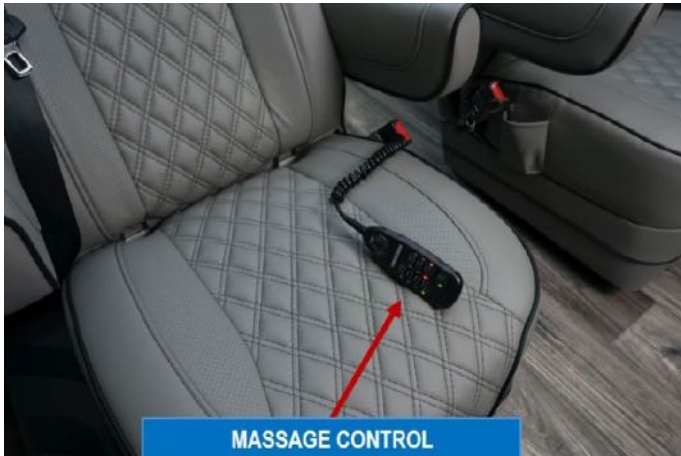


DANGER

Failure to securely lock the seat to the steel floor mounting plate could cause it to suddenly detach from the floor while the vehicle is either stationary or in motion, resulting in serious physical injuries and / or death.



Your coach may be equipped with the optional second row seat massage feature. To operate the seat massage feature, use the control to turn the unit on and adjust the massage frequency to a comfortable level. Turn off the massage feature when the coach is not in use, which will reduce the electrical load on the battery. Place the control in the seatback pouch when not in use to prevent it from being accidentally damaged.



WARNING

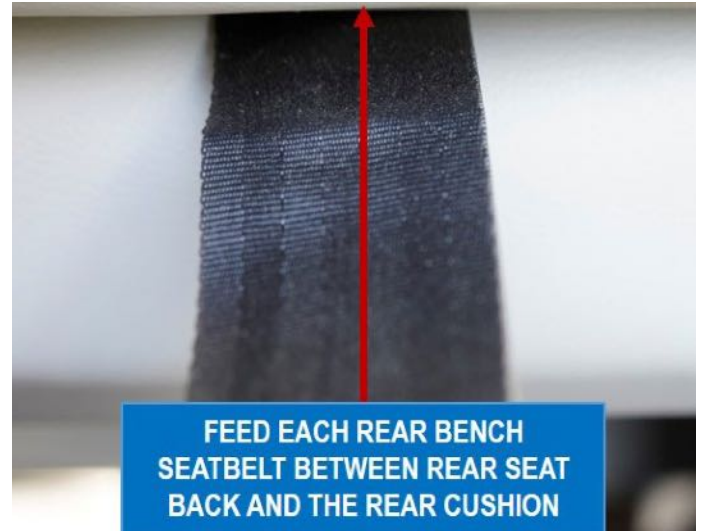
Ensure the massage control feature is turned off when the vehicle is not in use to prevent leaving an electrical load on the battery.

■ POWER FOLD-DOWN REAR BENCH SEAT

Your coach is equipped with a power folding rear bench seat. The seat is raised or lowered to an infinite range of positions by an electric motor, which is powered by the coach's house battery. If the motor does not operate for any reason, check to ensure your house battery is fully charged, as the motor may not operate off a weak battery. In this situation you may wish to start the coach or turn on the generator (if equipped) to power the unit and recharge the battery. Alternatively, you can connect to shore power which will provide sufficient current to operate the motor until your house battery is fully charged.

The power folding rear bench seat is equipped with three pairs of seatbelts for use by adults and children who do not require a child safety seat. The belts are permanently fastened to the load floor directly behind the rear bench seat and must be fed in between the rear seat back cushion and the rear seat bottom to be used. When not in use, the rear bench seatbelts may be rolled up and stored

on the rear coach floor. This is convenient when folding down the rear seat for use as a bed or as a flat storage surface. See the following image, which depicts a pair of seatbelts correctly passed through the rear bench seat.



NOTE

A discharged house battery may not provide sufficient power to the rear bench seat motor. Start the coach, plug into shore power, or turn on the generator if the battery is low.



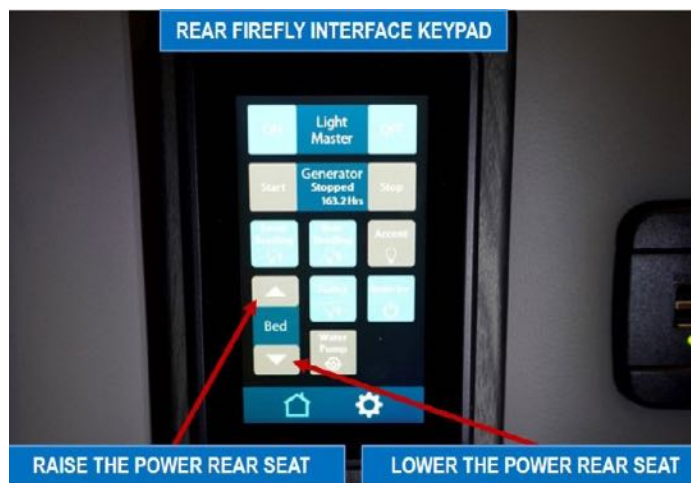
DANGER

Never allow occupants to ride on the rear bench seat without their seatbelts securely fastened. Failure to wear safety restraints will result in serious physical injuries and / or death in the event of a crash.

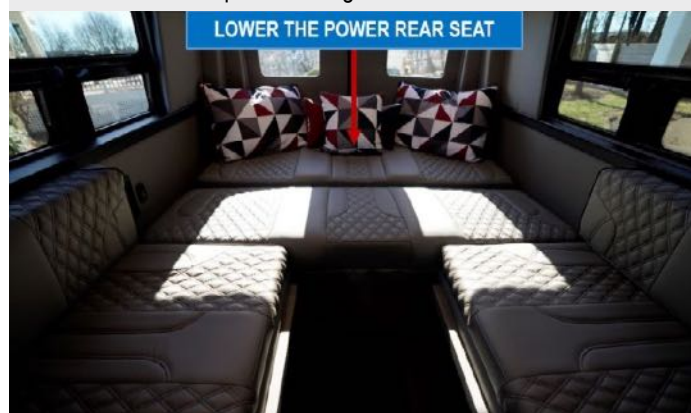
The power folding rear seat is operated through the Firefly interface display. By pressing the "BED" up or down button on the display, the rear folding seat will raise or lower from the normal seating position to a completely flat horizontal surface, which may be converted into a bed.

To maximize sleeping area, lift the driver's side rear ottoman seat cushion and remove the filler shelf from its stored position under the side seat. Place the filler shelf between the two ottoman seats just forward of the lowered rear seat. Next, remove the two ottoman side

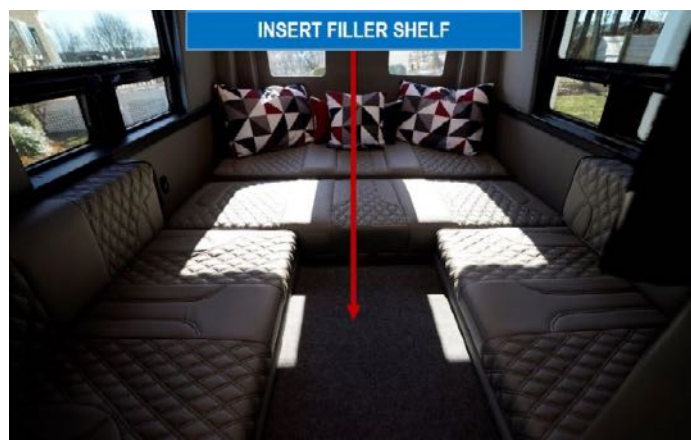
cushions and place them on top of the filler shelf between the two rear ottoman seat cushions. Follow the simple three-step procedure below to convert the bench seat to a sleeping or flat storage area.



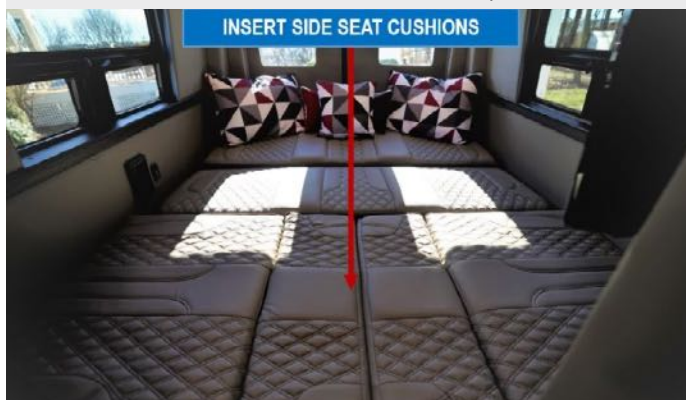
STEP 1 Lower the power folding rear seat.



STEP 2 Place the filler shelf between the two side ottoman seats.



STEP 3 Place the ottoman side cushions on top of the filler shelf.



To return the power folding rear seat to its normal upright position, simply reverse the steps listed above. Remember to replace the rear seatbelts if you removed them for sleeping purposes.



NOTE

Remove and store the pedestal table and its mount before lowering the power folding rear seat into the sleeping or flat storage position.



DANGER

Never allow passengers to lay down or ride upon the power folding rear seat in the lowered bed position while the vehicle is in motion, as this is extremely unsafe and could result in serious physical injuries and / or death.



WARNING

Before moving the vehicle secure all cargo, equipment and gear that may have been moved to accommodate changing the power folding rear seat position. Failure to secure cargo may cause items to shift suddenly, leading to loss of control of the vehicle and resulting in a crash.

■ PEDESTAL TABLE

Your coach may be equipped with a removable pedestal table, which is manufactured from the same high quality materials used in your galley countertop. The removable pedestal table may be installed in more than one location within the coach, depending upon how many mounting bases have been installed. Some coaches have a mounting base located in both the front and rear of the interior.

The removable table includes either the standard upright pedestal or the Lagun Table System® multi-position adjustable pedestal. When not in use, the tabletop may be stored in its protective pouch. The support pedestals may also be removed and stored out of the way.

The standard upright pedestal can support up to 50 pounds and it attaches to both the coach floor and the tabletop with a twist lock post and base assembly. Follow these three simple steps to install the standard pedestal table assembly:

STEP 1

Locate the table support post's floor mounted base plate. Make sure the base plate it is clean and that no debris is inside of the plate's center opening. Ensure the access hole in the optional carpeted floor mat aligns with the base plate as well. Install the vertical support post by holding it upright and engaging the locking tabs at the end of the post with the base plate, which is permanently mounted to the coach floor.



STEP 2

Rotate the vertical support post clockwise to lock it in place.



STEP 3

Place the tabletop with its mounting socket facing down and gently guide it onto the vertical support post. Press down gently to secure the tabletop onto the vertical support post's tapered plastic head. **See image below.**

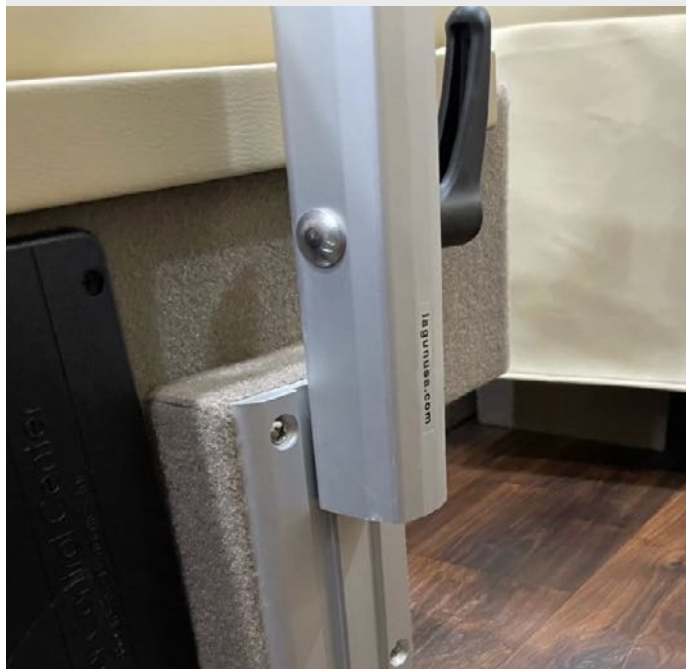


The optional Lagun Table System® Attaches to the coach with its own special mounting bracket and can support a maximum weight of 50 pounds.

Follow these steps to install the table:

STEP 1

Locate the height-adjustable table mounting plate at the rear or front of the coach. Slide the vertical support post down into the height-adjustable mounting bracket. Lock it in place by rotating the black handle on the height-adjustable mounting bracket.



STEP 2

Attach the swivel-arm to the vertical support post by aligning the hole in the end of the swivel-arm with the pin at the top of the vertical support post. Lock the swivel-arm in place by rotating the black handle at the point where the swivel-arm attaches to the upright support post.



STEP 3

Attach the tabletop by aligning its installation post (located on the bottom of the table top) with the hole in the end of the swivel-arm. Rotate the black handle at the end of the swivel-arm to secure the table top in the desired position. See Image below



NOTE

Attach the tabletop to the swivel-arm mount assembly last, after installing both the height-adjustable vertical support post and the swivel-arm mount assemblies. Attempting to install the swivel-arm assembly to the height-adjustable support post with the table top already attached will be difficult.

■ INTERIOR CARE AND MAINTENANCE

The interior of the American Coach Patriot combines premium quality fabrics, carpeting, and flooring materials to deliver superior comfort and luxury. With consistent routine care, cleaning and maintenance the interior of your coach will last for many years.

Environmental conditions and how you utilize the vehicle will have a substantial impact on the longevity of the interior, especially upholstery, carpeting and flooring materials. If you follow the guidelines listed below, your coach will provide an enjoyable ownership experience with minimal cost of upkeep, assuming average annual usage under normal operating conditions. Heavy usage, such as full time living, severe service in harsh climates, or camping in rugged environments will accelerate the wear of the interior components. Premature wear or failure of fabrics, carpeting and flooring under such conditions may not be covered under the coach's warranty.

Use care to avoid placing heavy gear, sharp objects, and metallic items against the wall coverings and on top of the carpeting. These items could damage the fabrics, cause tears and abrasions, leave rust stains, or trigger premature wear.

Certain dyed clothing items may transfer color to the upholstery and wall coverings if they become wet. Pets will also transfer dirt, natural skin oils, and could damage upholstery with their claws. Always cover the upholstery if you anticipate that pets will jump on or sit on the seats. However, do not leave upholstery covered long term as this could promote the discoloration of the seating surfaces or the formation of mold and mildew.

■ FABRIC WINDOW SHADES AND COVERINGS

Fabric materials are limited mostly to the window shades inside your American Coach Patriot. Clean those delicate fabrics gently with a dampened soft, and lint free microfiber towel. Avoid using any detergent type cleaners as the cleaners may cause the shade fabric to discolor or become brittle.

Extend each shade fully and carefully wipe the shade from the top down, using an overlapping technique to avoid spots that have not been cleaned. Take care not to apply excessive water or physical pressure to the fabric, which could damage the material and / or the wood trim around the window. Allow the shades to air dry fully before retracting them. Opening the windows, rear doors, sliding side door, and the roof hatch will aid in drying the shades fully.

Alternatively, the fabric may be cleaned using a low powered vacuum with a very soft drapery brush. Gently vacuum the shades using an overlapping technique and remove any debris from the drapery brush bristles between the cleaning of each individual shade.

■ CARPETING

Your coach is equipped with premium grade automotive carpeting. Regular cleaning will ensure its longevity and good looks. For best results, vacuum the carpet regularly to remove loose dirt, pet hair and dander, food crumbs, and other contaminants. This will reduce wear of the carpeting and will promote a clean and fresh smelling interior. Removable carpeting is best cleaned outside of the coach on a clean and dry surface. This is also a good time to clean the simulated wood grain composite or one piece woven flooring.

Clean heavily soiled carpeting with a mild soap and water mix. A commercial carpeting cleaning solution designed specifically for this purpose is also acceptable. Use a soft bristle brush to gently work the mixture through the carpet fibers, but do not saturate the carpeting. Work the brush back and forth in the same direction. Avoid making circles with the brush. Then use a soft clean and lint free dry cloth or a wet / dry vacuum to remove all cleaning solution or water residue. Never use bleach or laundry detergent products to clean the carpeting as it may permanently discolor and damage the carpet.

Avoid returning damp carpeting inside of the vehicle. Allow the carpeting to air dry thoroughly, preferably outside of the coach. Do not attempt to use heat to dry the carpeting. This is important to prevent permanent damage to the carpeting, the formation of mold, mildew, and unpleasant odors inside the vehicle.

■ COMPOSITE WOOD GRAIN FLOORING

Your American Coach Patriot may have composite wood grain flooring throughout the coach. This attractive and highly durable floor covering requires minimal effort to keep it clean and good looking.

Before cleaning the composite wood grain flooring, remove all carpet runners and floor mats, and any gear that may be stowed on the floor. Raise and secure the front and rear upholstery flaps on the rear fold-down seat, which will provide easier access to the areas beneath the seat.

For routine care vacuum the entire floor first. Use a crevice vacuum tool to reach under the seats to remove dirt, dust, pet hair, and other debris. This is also a good time to clean the steel mounting plate area beneath any removable seating.

Use a mild commercially available vinyl floor cleaning product and a damp mop to clean the entire flooring surface. Do not use

heavy amounts of cleaning solution or allow puddles to form on the flooring. Avoid splashing the cleaning solution onto the coach's walls, woodwork, wall coverings or permanent carpeting.

Clean difficult stains, heavily soiled areas, or mildew stains, with a diluted bleach and dish washing detergent mixture for spot cleaning only. **Follow these steps:**

STEP 1 Mix a solution of 1 cup bleach and 1/4 cup mild dish washing soap per gallon of fresh warm water.

STEP 2 First test a small and inconspicuous area to ensure the solution will not damage the flooring. Gently use a soft bristle brush or sponge moving across the flooring in all directions to remove any stains. Be extremely careful not to splatter this cleaning mixture onto the leather seating surfaces or wall treatments as the bleach mixture will permanently discolor the fabrics.

STEP 3 Use clean fresh water with a sponge and no detergent to remove all traces of the bleach / dish washing mixture. This is essential to avoid permanent discoloration of the flooring.

STEP 4 Dry mop the entire floor after cleaning with any liquid product. Do not allow puddles or water beads to remain on the floor surface as these could cause damage to the subflooring, wood cabinetry, or promote the growth of mold or mildew. Air dry the coach thoroughly afterward.

Remove all carpeted floor mats and all unsecured objects from the flooring prior to cleaning the composite wood grain flooring.



WARNING

Use extreme care when cleaning stubborn stains with a bleach / dish washing detergent mixture. Work on small areas and avoid causing splatter as any bleach mixture will permanently discolor or damage the upholstery, fabrics and carpeting in the coach. Thoroughly remove all traces of the bleach / dish washing detergent after cleaning and air dry the vehicle thoroughly.

■ ONE PIECE WOVEN FLOORING

If your coach is equipped with the one-piece woven vinyl flooring system, basic care and cleaning will ensure its longevity and good looks for many years.

For routine care vacuum any loose dirt, dust or debris from the entire floor surface. Use a crevice vacuum tool to reach under the seats to remove dirt, dust, pet hair, and other debris. This is also a good time to clean the steel mounting plate area beneath any removable seating in the coach.

Remove stains with a mild soap and water mixture with a soft bristle brush. Do not use any harsh household chemicals as these could permanently damage the finish of the flooring. Remove all soap residue with a clean damp sponge or towel and allow the flooring to air dry thoroughly before closing the vehicle. If necessary, leave the windows and sliding side door open, and activate the roof fan to promote high air flow throughout the coach until the flooring is completely dry. This is very important to avoid the establishment and buildup of mildew or mold within the coach.

Clean difficult stains, heavily soiled areas, or mildew stains, with a diluted bleach and dish washing detergent mixture for spot cleaning only. **Follow these steps:**

STEP 1 Mix a solution of 1 cup bleach and 1/4 cup mild dish washing soap per gallon of fresh warm water.

STEP 2 First test a small and inconspicuous area to ensure the solution will not damage the flooring. Gently use a soft bristle brush or sponge, moving across the flooring grain in all directions to remove any stains. Be extremely careful not to splatter this cleaning mixture onto the leather seating surfaces or wall treatments as the bleach mixture will permanently discolor the fabrics.

STEP 3 Use clean fresh water with a sponge and no detergent to remove all traces of the bleach / dish washing mixture. This is essential to avoid permanent discoloration of the flooring.

STEP 4 Remove all traces of standing water, especially near the cabinet bases, and air dry the coach thoroughly as noted above to prevent mildew or mold from forming inside the coach.

**NOTE**

Remove all carpeted floor mats and all unsecured objects from the flooring prior to cleaning the one-piece vinyl floor.

**WARNING**

Use extreme care when cleaning stubborn stains with a bleach / dish washing detergent mixture. Work on small areas and avoid causing splatter as any bleach mixture will permanently discolor or damage the upholstery, fabrics and carpeting in the coach. Thoroughly remove all traces of the bleach / dish washing detergent after cleaning and air dry the vehicle thoroughly.

■ SIMULATED LEATHER CLEANING AND CARE

The interior walls, seats, and ceiling of the American Coach Patriot are covered with Halo Austin Plus® soft touch automotive color keyed simulated leather fabric. This polyurethane based material is durable and attractive. It does not contain plasticizers, heavy metals, formaldehyde, or pyroxylin, and is easy to clean and maintain. For routine cleaning use a damp, lint free, soft cloth with mild soap and water to wipe down the walls and ceiling. Rinse the cleaning cloth frequently, then remove any soap residue with a damp cloth that has been rinsed well in clean water. Do not leave the ceiling or walls wet.

To disinfect surfaces, or to remove stubborn stains, a mixture of bleach and water at a 1:5 ratio or use of other alcohol based disinfectants is acceptable. Do not use any acid based or abrasive cleaners. Do not rub hard to remove stains from the fabric. Remove all bleach or cleaning solution residue afterward with a clean cloth rinsed well in fresh water.

Avoid leaving water beads or runs on the fabric as this could cause permanent stains to form. Air dry the interior thoroughly after cleaning. Open all windows, the rear doors and sliding side door. Open the roof hatch and activate the fan to promote high airflow throughout the coach while the interior surfaces are drying. This is very important to prevent mildew from forming.

Use of conditioners, protectants, and other chemicals on the walls and ceiling are not recommended and may actually accelerate the wear and deterioration of the covering materials. Certain products, especially those containing acids or petroleum, will accelerate the loss of fabric flexibility and may cause it to shrink or crack, which is not covered under warranty.

■ WET BATH

The wet bath is a one-piece fiberglass unit that provides for both lavatory and bathing needs in one efficient and sanitary space. Keeping the wet bath clean is straight forward and easy.

The one piece fiberglass unit has two opening doors. The left door is the primary entry, and the right-side door may also be opened to enable easy access, cleaning, and drying out of the bathroom. The right-side door is held in the closed position by a single pull type latch assembly, located at the top of the door. To open the right door, simply grasp the latch ring and pull it straight down to release the door. Behind the right-side door is a full length shower curtain, which may be pulled across the entire wet bath opening. A power switch is located just outside of the wet bath entry door to control the interior LED ceiling lighting.

A solid surface sink, with center pull faucet is located in the left corner of the wet bath. Located directly above the sink is a shower wand. A full sized porcelain toilet, with pedal flush is located to the right side of the wet bath entry. Operation of the toilet and sanitation system is covered in SECTION 8 (PLUMBING AND SANITATION SYSTEMS) of this manual.

The wet bath provides a fully enclosed shower for privacy and convenience. **To operate the shower follow these procedures:**

STEP 1

Open both doors and pull the shower curtain half way across the opening from right to left, making sure it is in complete contact with the right (forward) shower wall and that the curtain is inside the floor pan of the shower stall.

STEP 2

Close the right-side door or you may leave it open at your discretion. This is a good time to check to ensure window shades are closed for privacy purposes.

STEP 3

Enter the shower stall and close the shower curtain completely, ensuring the curtain is making contact with both ends of the shower stall walls, and that the bottom of the curtain is inside of the floor pan.

STEP 4

Run the water in the sink until desired temperature is reached. Use the shower wand by rotating the water flow control lever from the closed to the opened position to allow water to flow through the shower sprayer head. Replace the wand in the shower head mount when done.



NOTE

Turn on the water pump at the main Firefly interface before operating the shower. You may operate the shower wand in the holder or by hand. Make certain the shower control lever is in the off position when finished using the shower. Otherwise water could unintentionally flow from the shower head if the bathroom faucet is turned on.

Wipe down the wet bath walls, toilet, sink, and curtain with a soft absorbent cloth or sponge to remove any remaining water after showering. Turn on the shower exhaust fan if it is not already on, which will help to dry out the compartment.



DANGER

Do not use the shower or toilet facilities with the vehicle in motion. The coach must be parked on solid level ground to use the bathroom facilities. Attempting to use the shower or toilet while the vehicle is moving could result in damage to the vehicle and severe injury or death of persons.



WARNING

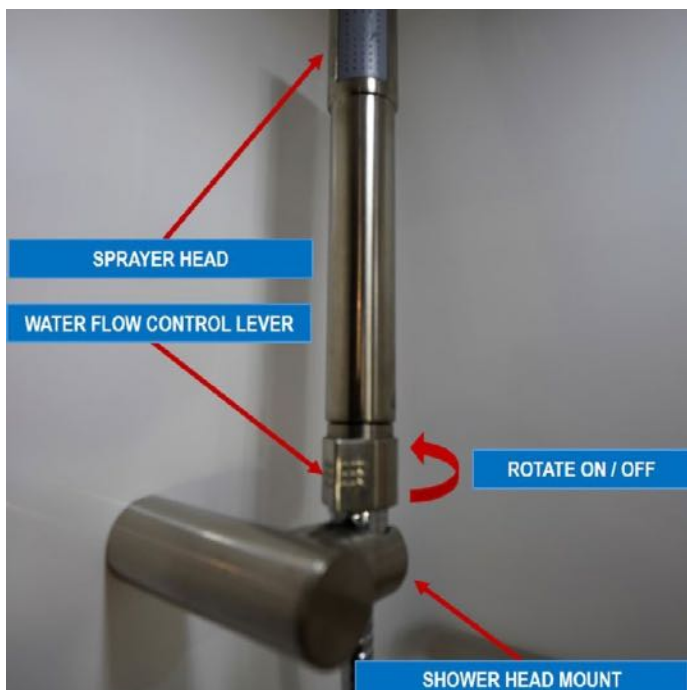
Operate the shower on solid level ground to ensure proper water drainage. Ensure the shower curtain is completely closed and inside of the wet bath floor pan. Failure to do so could result in water entering the coach, which could cause significant damage to the vehicle floor and / or other interior components.

When cleaning the shower, use a mild detergent and / or disinfectant to clean the surfaces and the sink. Rinse away any detergent residue and then follow the procedures above to wipe down and air dry the enclosure. Do not use any cleaning products that contain solvents or an abrasive compound as this will damage the glossy finish of the enclosure.



WARNING

Rinse off all soap residue immediately after using the shower. Do not rub the finish aggressively to remove stains as this will permanently scratch the finish. Never use bathroom cleaners that contain acids, solvents, or abrasive compounds, which will permanently dull or damage the finish.



WARNING

To avoid water spots, gently wipe down the shower stall after use with a clean and soft cloth. Never wax the shower stall walls or the wet bath floor as this will create a dangerously slippery condition, which could result in a fall and / or serious physical injury.

Always thoroughly air dry the wet bath enclosure after using the shower. Your wet bath includes a ceiling vent to aid in air circulation, drying, and evacuation of bathroom odors. The 12- volt DC ceiling exhaust fan is activated by depressing a button located on the inside face of the fan to the lower right of the handle. Push the handle upwards to open the fan's protective roof cap, and pull it down to close the cap when the fan is not in use. **See image below.**



WARNING

Air dry the wet bath enclosure thoroughly after using the shower. Failure to dry the compartment completely may result in the formation of mold and / or mildew in the compartment. This is especially important when using the shower in hot and humid environments, and prior to placing the coach into long term storage.

■ RETRACTABLE CLOTHES LINE

The wet bath includes a convenient retractable clothes line, which allows occupants to hang wet or dry towels inside the compartment. Twist the locking collar counterclockwise to release the line. The locking collar is located where the line exits the housing, which is located on the upper left (rearward) inside top corner of the bathroom wall. Stretch the line to the right (forward) inside top corner of the bathroom wall and insert the button into the key shaped retainer. Tighten the locking collar so the line will remain tight.



WARNING

Do not leave damp or wet towels in the wet bath compartment for extended periods as this will promote the formation of mold and mildew. Remove all wet towels and clothing whenever the vehicle is not in use. Air dry the compartment thoroughly after each use and before placing the coach into long term storage.



SECTION 8

Plumbing and Sanitation Systems



PLUMBING AND SANITATION SYSTEMS

The American Coach Patriot is equipped with a comprehensive plumbing system to provide maximum comfort, utility, and capability for overnight and extended stay traveling. Your luxury coach's plumbing system conveniently delivers everything you need, from fresh drinking water, to bathing, and private lavatory facilities. This section describes in detail how each major component functions, and what you must do to maintain a sanitary fresh and waste water system in your coach, as well as how to winterize it.

The plumbing system in your coach is divided into three major sections: Fresh water; gray water; and, waste (black) water. Each section has a specific function and is designed to ensure safe water management. Please read this section fully to familiarize yourself with the operations and maintenance of the plumbing system installed in your coach. This will ensure an optimal customer experience and years of safe and reliable service.



NOTE

The procedures outlined in this section are representative of the typical coach layout. Plumbing system components and equipment will vary based on features and equipment that accompany a wide range of models. Equipment depicted may also be different from what was originally installed in your coach, as product enhancements and changes are made over time.



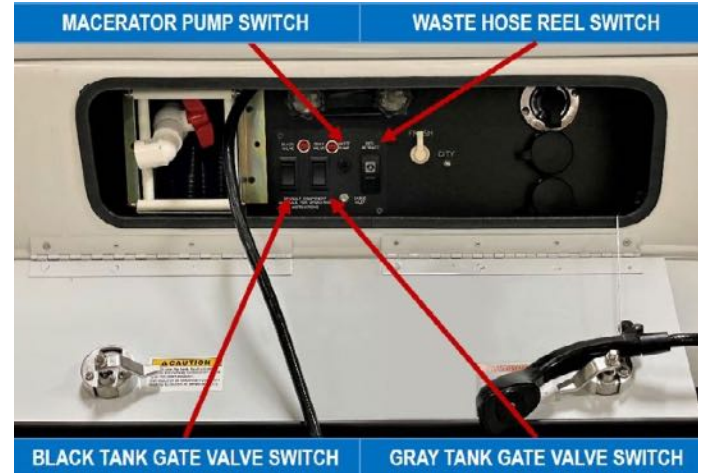
NOTE

If you cannot find the information needed to safely operate your coach, if a component is not covered herein, or you require assistance with a specific function, please contact our Customer Service and Warranty Department at (574) 522-4878. A product technical advisor will provide you with assistance directly.

■ CITY WATER SUPPLY

Fresh drinking "potable" water from a "city" water supply (e.g., from a hose connected to a potable water source) is delivered into your coach via a City Water / Fresh Water Tank Fill Inlet, which is located in the wet bay compartment on the driver's side of the vehicle, just forward of the rear wheels. To connect an external water supply, use a clean water hose designed for potable water transfer to connect from the water source to the coach. Potable water hoses are readily available

from your dealership and other sources. Once connected, move the City Water / Fresh Water Tank Selector Lever to the "City" position. You may then turn on a regulated water supply to furnish water to the coach. Water pressure to the coach should not exceed 50 PSI.



■ FRESH WATER PUMP & TANK

A 12-volt DC powered 3 GPM freshwater pump is installed inside your coach on the driver's side beneath the side ottoman seat. This pump will provide pressurized freshwater service at 55 PSI to each faucet and shower fixture. The pump only activates when drawing water from the coach's onboard freshwater storage tank, which is located beneath the coach.

This constant pressure type pump will activate whenever it senses a pressure drop on the output side of the pump, provided it has been turned "on" at the main Firefly network interface display. The pump should be set to the "Off" mode whenever you are away from the coach or connected to regulated city water. This will prevent any accidental flooding of the coach interior, or possible high-water pressure damage from occurring to the pump.





WARNING

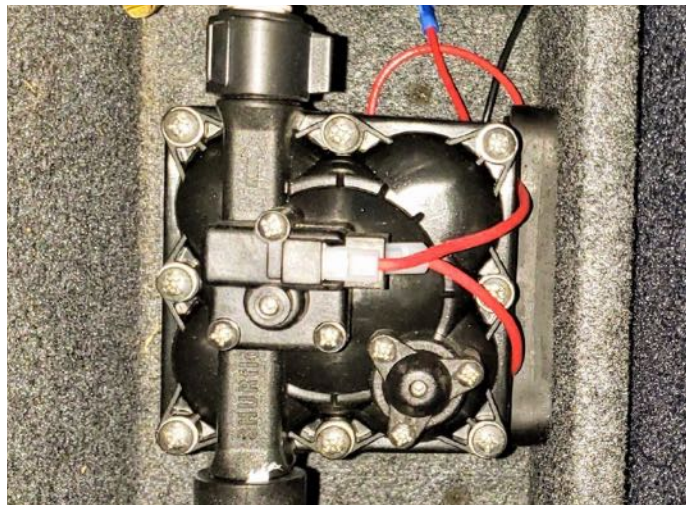
Before setting the water pump to the "On" mode, make certain all faucet and shower fixtures are turned off. Pay particular attention to the outside shower located in the wet bay compartment, as it may be inadvertently turned on when an operator has installed the water supply hose or has been operating the macerator dump valves and hose. When this happens, water may appear to be suddenly pouring out from beneath the vehicle.

The water pressure pump has an inlet on one side that connects directly to the coach's onboard freshwater storage tank. At the entrance to the inlet is a round particulate filter screen in a clear plastic bowl-shaped housing. The screen may be removed for cleaning by unscrewing the plastic filter housing from the pump.

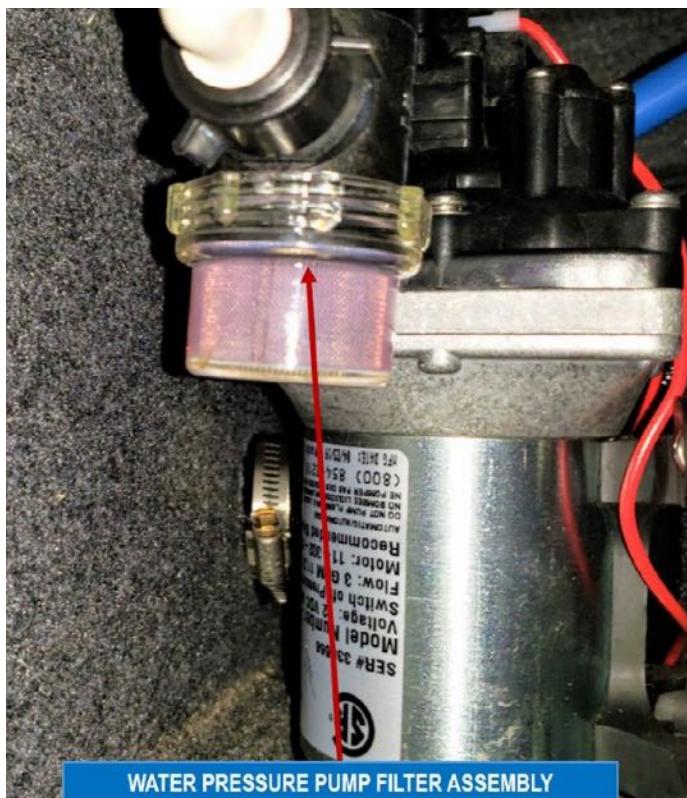
Always turn off the pump and shut off the city water supply before servicing the inline water filter. Place an absorbent towel beneath the filter before removing it as a small quantity of water will dribble out of the housing once the filter and cup assembly are removed. Failure to turn off the pump and the water supply could result in water suddenly entering the coach. **See the pump's side view below.**

See the pump's top view below.

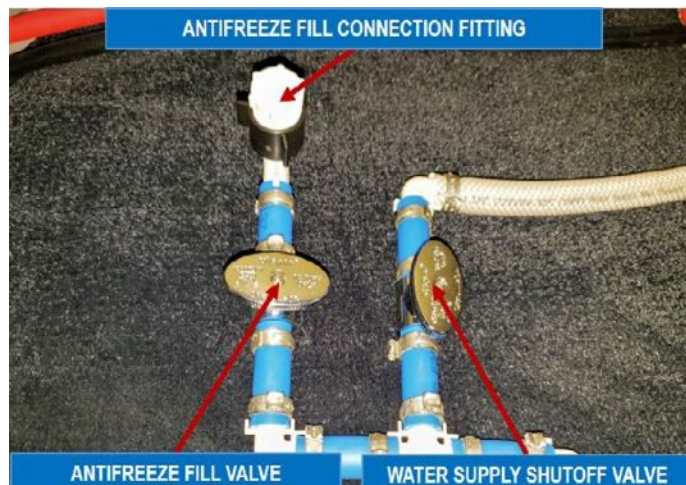
The water pump is easily accessible for repair and / or winterization. It is fastened to the coach with four screws via isolation mounts with rubber grommets to reduce vibration. When the pump runs it will generate a low frequency vibration inside the coach. This is normal. If the pump runs continuously, check the water tank level as the tank may have run dry. Otherwise, a continuously running pump indicates a fixture is open allowing water to be pumped through the system.



Directly adjacent to the pump is a winterization valve and fitting arrangement, which permits the introduction of non-toxic RV antifreeze into the water system. One valve shuts off the incoming water supply. The other valve allows anti-freeze to flow into the system after a supply source of anti-freeze has been connected through the antifreeze fill connection fitting. This process is covered in greater detail later in SECTION 12 – WINTERIZATION AND STORAGE.



WATER PRESSURE PUMP FILTER ASSEMBLY



ANTIFREEZE FILL CONNECTION FITTING

ANTIFREEZE FILL VALVE

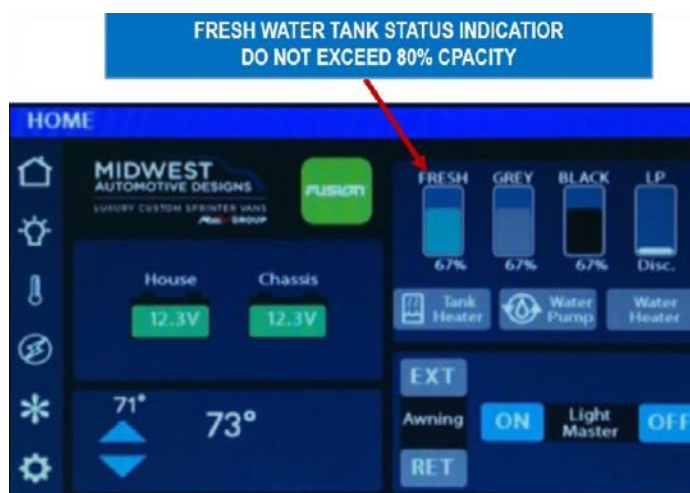
WATER SUPPLY SHUTOFF VALVE



WARNING

If the ambient outside temperature is below freezing, the water supply line between the freshwater tank and the pump may freeze. In this situation, the water pump will attempt to run, but little or no water will come out of the fixtures. Stop the pump immediately, as ice in the water line can damage the diaphragm inside the pump.

Your coach is capable of carrying up to 32 gallons of freshwater (model dependent) in a permanent storage tank suspended beneath the coach, or by allowing "city" water to enter the system directly through an external hose attachment. Freshwater tank status is monitored via the main Firefly network interface display. The tank should not be filled beyond 80% capacity. **Please refer to the image below.**



■ WATER QUALITY AND PURIFICATION

It is extremely important to maintain a safe quality drinking water supply in your coach, and to properly process and dispose of any wastewater. This is critical to promote a healthy living environment for you and your passengers, whether on a short day trip or while venturing out on extended stays.

The first and most important step is to ensure the coach's freshwater system and storage tank are free of biological contaminants. Contaminated water can easily transmit diseases such as diarrhea, cholera, dysentery, and other potentially deadly ailments. Therefore, it is essential to purify the water entering your plumbing system and to sanitize the storage tank and supply lines on a routine basis.

Either of your coach's freshwater sources can easily become contaminated. Therefore, to reduce the risk of potential exposure to biological risks and health hazards you must purify the system on a regular basis. To accomplish this, please read the following section carefully, and complete the procedures as outlined. If you are unable or uncomfortable with completing this process yourself, your American Coach dealership can perform this service for you.

■ SANITIZE THE WATER TANK / SUPPLY LINES

Before placing your coach into regular service, and at least semi-annually, **follow these step-by-step procedures to sanitize the freshwater tank and the coach's internal supply lines:**

STEP 1 Turn off the water pump and make sure the coach is not connected to a city water supply;

STEP 2 Turn off the LP gas solenoid switch at the exterior remote fill compartment, or the circuit breaker to the Whale water heater depending on how your coach is equipped. This prevents the water heater from activating during the water line sanitizing process;

STEP 3 Open all faucets (including the shower head) inside the coach to allow the water lines to drain. Once they have drained, close all faucets;

STEP 4 Remove the drain plug from the bottom of the freshwater tank and allow any water inside to completely drain out;

STEP 5 Operate your water and shower fixtures as you would at Reinstall the drain plug once the tank is completely empty;

STEP 6 Using a commercial in line RV water filter assembly, remove the filter cartridge element and pour approximately 5 ounces of ordinary household bleach into the empty filter element housing. Screw the clear filter element housing securely onto the housing fixture and connect the unit in line to the City Water / Fresh Water Tank Fill Inlet with a reliable clean fresh water supply via a potable water approved hose;

STEP 7 With the filter containing the bleach inline with the supply hose, connect a short supply hose between the filter and your coach;

STEP 8 Set the City Water / Fresh Water Tank Selector Lever in your coach's wet bay to "City" and turn on the water supply. Open a fixture inside the coach and allow water to flow until you smell bleach, then shut off the fixture.

STEP 9

Set the City Water / Fresh Water Tank Selector Lever to "Tank" and turn on the water supply. Allow the fresh water tank to completely fill, then turn off the water supply and remove all hoses;

STEP 10

Drive the coach a few miles to agitate the water / bleach solution in the storage tank;

STEP 11

Turn on the fresh water pump inside the coach and pump the water / bleach solution through the cold water side of each fixture until you smell the bleach. Repeat this for the hot water side of each fixture. Don't forget to also pump this mixture through the inside and outside shower fixtures, and flush the toilet well to run this mixture through the toilet supply line as well;

STEP 12

Turn off the water pump and allow the system to sit for 12 hours or overnight;

STEP 13

With the water pump off, open all of the fixtures, then remove the drain plug from the water tank to allow it to completely drain out. Close all fixtures and reinstall the tank's drain plug. Then connect a potable water hose to the City Water / Fresh Water Tank Fill Inlet and refill the water tank partially with fresh water only;

STEP 14

Drive the coach a few miles to agitate the water in the tank;

STEP 15

Remove the tank's drain plug and allow the tank to fully drain. Open the faucets to allow the lines to drain as well. Then close the faucets and reinstall the tank drain plug;

STEP 16

Connect a fresh water hose to the City Water / Fresh Water Tank Fill Inlet and fill the water tank with fresh water to the desired level;

STEP 17

Set the City Water / Fresh Water Tank Selector Lever to "City" and open a fixture inside. Allow it to run until there is no bleach odor coming from the water;

STEP 18

Set the City Water / Fresh Water Tank Selector Lever to "Tank" and turn on the water pump. Run each fixture until there is no bleach odor. Don't forget to do this with the interior and exterior shower as well;

STEP 19

Once you are satisfied that there is no bleach remaining in the water lines, you may turn the LP Gas solenoid switch back on or turn on the Whale water heater circuit breaker as appropriate. Your fresh water system is now ready to deliver safe drinking water.

**DANGER**

Failure to routinely maintain a properly sanitized freshwater system will result in exposure to harmful bacteria and biological contaminants, which may result in serious illness and / or death.

**WARNING**

A potential exposure risk to Chlorine exists. Chlorine commonly occurs in household bleach, and disinfectants. It is used to control odor and as a demulsifying agent in water treatment. Chlorine exposure may cause mild respirator and eye irritation.

■ GRAY WATER TREATMENT & TANK

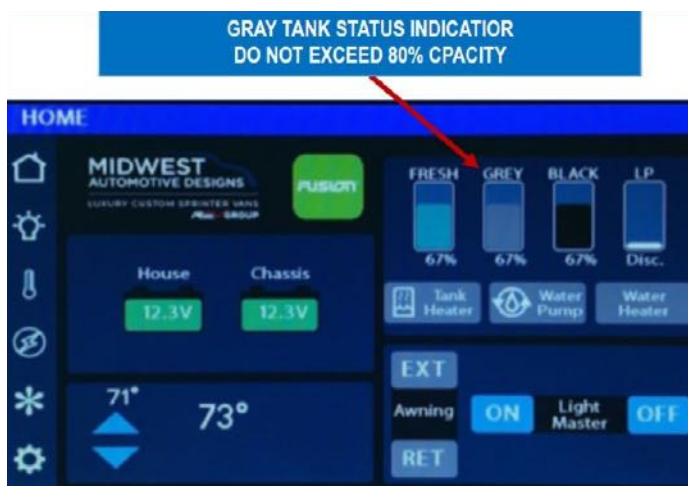
Water that passes into each sink and shower drain in your coach flows to and is stored within the "Gray" water tank suspended beneath the coach. The tank can hold up to 27 gallons of gray water (model dependent). This water does not ordinarily require any special treatment before ultimately being discharged via a wastewater pump out station.

Monitor the status of your gray water tank carefully via the main Firefly network interface display. When the status approaches 80% full, you will need to drain the tank via an RV pump out station. Never simply discharge the "gray" water tank contents onto the ground or into a storm drain. All wastewater must be processed.

**NOTE**

Before pumping out the contents of your "Gray" tank, check with the pump out station management to ensure full compliance with their wastewater treatment requirements and disposal procedures.

To help prevent odors from backing up through the gray water system, each drain has a "trap" installed between it and the storage tank. It is a good practice to occasionally pour a small capful of bleach or anti-bacterial dishwashing liquid mixed with water into each drain when the vehicle will be sitting unused for a period of time. This will aid in the prevention of bacteria buildup inside the drain, and will help keep the interior of your coach smelling fresh.



caution and always alert guests to the limitations of your RV lavatory facility. As with the “Fresh” water and “Gray” water tanks, monitor the “Black” tank via the main Firefly network interface display and never exceed 80% of the tank’s capacity. An overfilled tank may cause the toilet to overflow, especially when traveling in areas with extremely high ambient temperatures.



WARNING

Never flush, paper towels, facial tissues, feminine hygiene products or other highly fibrous materials down the toilet. Use only “RV” approved toilet tissue. These materials will not breakdown easily and completely in the black tank and may clog or jam the macerator discharge pump, resulting in a messy, unsanitary, and potentially costly repair.



WARNING

Monitor the “Gray” tank fill status closely via the main Firefly network interface display. If a sink or the shower drain appear to “back up”, you should stop running the water immediately and check on the tank’s fill status. It is probably at or nearly full. Overfilling the “Gray” tank could allow water to flow into the coach’s interior, causing significant damage to the floor, carpets, and cabinetry.



WARNING

Avoid flushing hair, paper products, tissues, vegetable peelings, and other highly fibrous materials down the drains in your coach’s sinks and the shower. Attempting to free a clogged drain in your coach can result in a messy and / or costly repair.

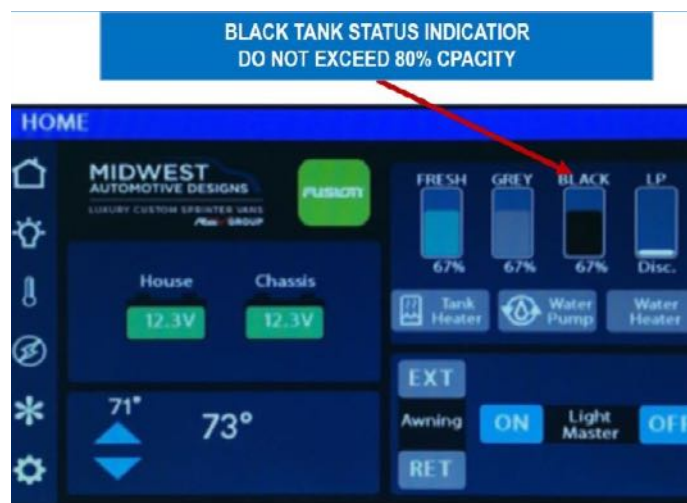
■ BLACK WATER TREATMENT & TANK

Waste and water that is flushed through the coach’s toilet is considered “Black” water, and it drains directly into the “Black” water holding tank. Your coach’s black tank holds up to 15 gallons of wastewater (model dependent). This tank is located directly under the toilet inside the coach. The contents of this tank must be treated by any number of commercially available waste holding tank chemicals that are specifically designed for RV holding tank deodorizing, waste digestion, and temporary waste storage.

Unlike a household toilet, flushing paper towels, facial tissues, feminine hygiene products, and highly fibrous materials will cause serious clogs and problems with the complete breakdown and discharge of the contents in the “Black” tank. These materials will easily jam the blades in the macerator discharge pump as well. Use

■ WATER HEATER (PROPANE)

If your coach is equipped with a Liquid Propane Gas (LPG) tank your water is heated by the Suburban IW60 Nautilus water heater. This high efficiency water heater is located at the driver’s side rear of the coach beneath the rear power fold down bench seat.



The Suburban water heater is a self-contained unit. It has an outside exhaust vent cap located at the driver’s side rear corner of the coach. Do not touch the vent cap when the unit is running as it will become very hot while the burner is heating the water.

Please read the Nautilus Service and Training Manual that accompanied your coach. Refer to the image of the remote-control display and the Display Description table.

To operate the unit, follow these steps:

STEP 1

Turn on the freshwater pump at the main Firefly network interface display to use onboard water, or connect to city water;

STEP 2

Turn on the power to the water heater by pressing the "On/Off" button (number 7);

STEP 3












Open a faucet or shower fixture and allow water to flow from the hot water side. Once the heater senses .5 gallons / minute of flow it will ignite the burner and you will see a flame icon appear on the display (number 2). The burner will make three attempts to ignite after which it will lock out. If a lockout occurs you will receive an "Error" notification on the screen. If this occurs, turn off the water and the power button. Let the unit sit for a moment and retry.

STEP 4

Adjust the water temperature to the desired setting. The unit is factory set to 120°F, but may be adjusted by pressing the appropriate button (number 9 "Up" or 10 "Down"); and,

STEP 5

Operate your water and shower fixtures as you would at home, using the hot and cold water levers to adjust the temperature to the desired setting. Keep in mind that turning the hot water lever down too low will cause the flow rate to drop below .5 gallons / minute. If that occurs, the hot water heater's burner will shut off.

DISPLAY DESCRIPTION			
1		BURNERS	 2 BURNERS  5 BURNERS
2		FLAME	This icon is displayed when FLAME is established.
3		BLOWER	This icon is displayed when the BLOWER is running
4	OFF	STATUS INDICATOR	This icon is displayed when the Water Heater is in standby mode, ready to be used.
5		SETTING TEMP INDICATOR; OUTLET WATER TEMP INDICATOR	A. When setting the water temperature, the temperature display will flash. After SET Temperature is reached, the display stops flashing after a few seconds. B. When the demand for hot water has been terminated, the display will return to the SET Temperature. C. When the water heater is turned off, the letters "OFF" will be display.
6		FREEZE PROTECTION	This icon is displayed when the FREEZE PROTECTION MECHANISM is engaged.
BUTTON DESCRIPTION			
7		ON/OFF	Power Button. Switch from turning unit ON or turning unit OFF.
8		SWITCH	Hold for 5 seconds to switch between degrees (°) Celsius or degrees (°) Fahrenheit
9		UP	INCREASE SET Temperature by 1 degree increments. Setting range is 35°C/95°F to 55°C/130°F
10		DOWN	DECREASE SET Temperature by 1 degree increments. Setting range is 35°C/95°F to 55°C/130°F


NOTE

Turning off the shower water flow with the shower head lever will cause the water heater to shut off, since the lever stops all water flow through the hot water line.


■ WATER HEATER (ELECTRIC)

If your coach is equipped with the Freedom Lithium® package your water is heated by the Whale S360EW 12-Volt DC electric water heater. This high efficiency water heater is located at the driver's side rear of the coach beneath the rear power fold down bench seat. The Whale water heater is a self-contained unit. It has no exterior exhaust vent cap as the unit is powered entirely by 12-volt DC electric current, and it operates off the house battery bank.

Please read the Whale Installation and Operating Manual that accompanied your coach. **To operate the unit, follow these steps:**

STEP 1

Turn on the freshwater pump at the main Firefly network interface display to use onboard water, or connect to city water;

STEP 2

Turn on the water heater at the main Firefly network interface display;

STEP 3 Operate the water and shower fixtures as you would at home;

STEP 4 Monitor your house battery bank closely when operating the hot water heater as the unit's 30 amp current draw will deplete the state of charge rapidly; and,

STEP 5 Turn off the water heater when it is not in use or expected to be used anytime soon. This will help prevent unnecessary discharge of the house battery bank.



WARNING

Monitor the house the battery bank state of charge carefully when operating the 12-Volt DC hot water heater. Operate the water heater while connected to shore power whenever possible.



WARNING

Hydrogen Gas can be produced in a hot water system that has not been used for a long period of time (generally 2 weeks or more). Hydrogen gas is explosive. To reduce the risk of injury open the galley faucet for several minutes until there is a smooth water flow. If hydrogen is present, there will be an unusual sound similar to air escaping through the pipe as the water begins to flow.

■ **FIXTURES (BATH, SINK, GALLEY, INTERIOR SHOWER, EXTERIOR SHOWER)**

Your coach is equipped with premium quality bath and shower fixtures. Operate the faucets and shower heads just like you would at home. Keep in mind that running the water excessively will fill the gray water storage tank rapidly. This will also potentially deplete your onboard fresh water supply more quickly.



To operate any of the fixtures turn on the water pump at the main Firefly network interface or connect your coach to city water. When not in use, turn off the water pump and open the faucet momentarily to allow the pressure to bleed off.

■ **TOILET**

The American Coach Patriot is equipped with a Thetford Aqua-Magic® household style all-plastic toilet with pedal flush. This lightweight bathroom fixture provides excellent fill and flushing through a single convenient front mounted foot pedal.

Before using your Aqua-Magic® toilet please read the Thetford Aqua Magic Permanent RV Toilet Owner's Manual that accompanied your coach at time of delivery. **Then follow these procedures:**

STEP 1

Turn on the freshwater pump at the main Firefly network interface display to use onboard water, or connect to city water;

STEP 2

Partially depress the foot pedal to allow water to fill the toilet. If you press too hard, the flush blade will retract and the bowl will empty;

STEP 3

To completely flush the toilet, step down fully on the pedal. The flush blade will retract and the water will rinse the bowl clean; and,

STEP 4

After flushing you can either leave the bowl dry or allow about an inch of water to cover the bottom. Keep in mind that the toilet bowl should always be emptied before driving to avoid an unpleasant mess in the bathroom.

Before using your toilet, add an "RV approved" waste treatment and deodorant solution or dry chemical treatment tablet / packet to the toilet following the manufacturer's directions. The toilet was designed for use with Thetford brand holding tank deodorants. Only use RV or Marine approved bathroom tissue, which breaks down more rapidly than conventional household paper.

Monitor the black tank level regularly to avoid a situation where you are unable to flush the toilet due to an over filled waste holding tank.

Clean the toilet with a soft bristle brush or sponges. Do not use scouring powders, acids, or strong concentrated cleaners as they will permanently damage the bowl, the flush seal, and the flush mechanism.



WARNING

Never flush paper towels, facial tissues, hair, or feminine hygiene products. These items may jam or damage the toilet's flush mechanism and will not break down properly in the black tank. They will also jam the macerator discharge pump causing a potentially costly repair.

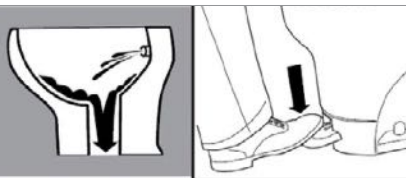


WARNING

When flushing the toilet, always ensure any paper and solid waste flushes completely through and is not caught in the flush mechanism's blade. Failure to completely flush the toilet could jam the flush mechanism's blade in the open position.



To flush, press all the way
Pour tirer la chasse,
appuyez jusqu'au bout
Para descargar el tanque,
oprímalo hasta el fondo



To add water, press halfway
Pour ajouter de l'eau, appuyez
seulement jusqu'à la moitié
Para añadir agua, oprímalo
hasta la mitad del recorrido



WARNING

If the water in the toilet freezes, or the water lines in the coach freeze, do not flush the toilet as ice may damage the flushing mechanism.

HOLDING TANK HEATING PADS

The fresh water and gray water holding tanks are equipped with 12-volt DC powered heating pads to reduce freezing damage during transient periods of low ambient temperatures. The heating pads do not make your coach "four-season" capable. The heating pads only protect the storage tanks and will not warm the coach's exterior plumbing lines and drain system, which are routed and attached beneath the vehicle.



NOTE

Before outside ambient temperatures are expected to be consistently below freezing (32°F), the coach's entire plumbing system should be winterized.

To activate the heating pads, turn them on at the main Firefly network interface display by touching the "Tank Heater" selector button.



Once activated, the 12-volt DC heating pads will turn on when the outside ambient temperature drops below 45°F. The heating pads may be operated continuously while: connected to 12-volt AC shore power; when the optional Onan LP generator is operating; or, while the 3.0 turbo diesel engine is operating. When operating the heating pads using battery power only, the house bank will rapidly discharge in as little as 4 to 8 hours, depending upon the type and capacity of battery(s) installed in your coach and any other loads that may be placed on the house bank.



WARNING

Heating pads will not protect the coach's entire plumbing system during freezing conditions. When outside ambient temperatures are expected to remain consistently at or below freezing the plumbing system must be winterized.



WARNING

Heating pads place a significant load on the 12-volt system. When operating off the house battery, the heating pads will rapidly deplete the house bank's state of charge.



WARNING

Monitor the house battery bank's state of charge frequently when operating the tank heating pads. Operating the heating pads using battery power only will deplete the house battery bank's state of charge quickly.

■ DISCHARGE GATE VALVES

You coach is equipped with gate valves that control the discharge of the contents of both the gray and black wastewater tanks. These gate valves are either manually operated, or power actuated depending upon the options installed on your particular coach.

■ MANUAL DISCHARGE GATE VALVES

Manually operated gate valves are located on the driver's side of the coach behind a small hatch in the lower valance. Unlatch the cover and gently lift it up to reveal both the discharge outlet and the gray and black gate valve handles. The gate valve handles are color coded gray and black to correspond to their respective tanks. **To drain the holding tanks with manual gate valves follow these procedures:**

STEP 1

Park the vehicle with the driver's side facing the RV pump out station waste receptacle or suction hose, making sure the vehicle is level;

STEP 2

Remove the discharge outlet cover by turning the cover ¼ turn counter clockwise. Then connect the RV pumpout suction hose to the outlet;

STEP 3

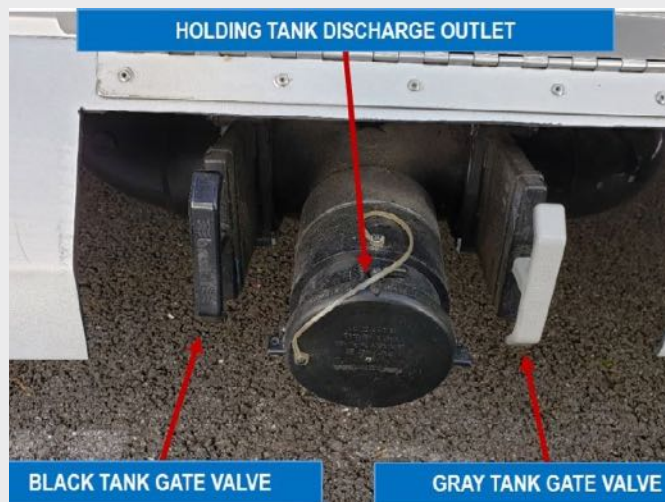
If using a standard 3" waste dump hose, connect it to the discharge outlet and lock it securely by twisting the locking collar on the hose ¼ turn clockwise to engage the studs on the discharge outlet.

STEP 4

Open the black tank gate valve by pulling the handle towards you. Waste water will flow into the pumpout suction hose or the 3" waste discharge hose. Allow the black tank to drain completely;

STEP 5

If a city water hose is available, connect it to the black tank flush fitting and turn on the water source to flush out any remaining waste in the black holding tank. Then turn off the water and close the black tank gate valve;



STEP 6

Open the gray tank gate valve by pulling the handle towards you. Gray water will flow into the pumpout suction hose or the 3" waste discharge hose. Allow the gray tank to drain completely;

STEP 7

If a city water hose is available, connect it to the gray tank flush fitting and turn on the water source to flush out any remaining waste in the gray holding tank. Then turn off the water and close the gray tank gate valve;

STEP 8

Remove the pumpout suction hose or the 3" waste discharge hose. If using the 3" waste discharge hose take your time to ensure it drains completely into the disposal drain inlet. Then replace the hose in its under carriage storage tube at the rear of the coach;

STEP 9

Replace the coach's discharge outlet cover, securing it with a ¼ clockwise turn. Visually confirm that both the black and gray valves are fully closed. Then close the hatch in the body valance and latch it securely; and,

STEP 10

Add RV holding tank waste treatment and deodorizing solution or tablets / packets to the black tank through the toilet to ensure it is ready for use again.

For coaches not equipped with a permanently mounted macerator discharge pump and reel, a portable macerator pump may be attached directly to the discharge outlet on your coach. Follow the pump manufacturer's directions, but always empty the black tank first, followed by the gray tank, and flush both with fresh city water whenever possible.



NOTE

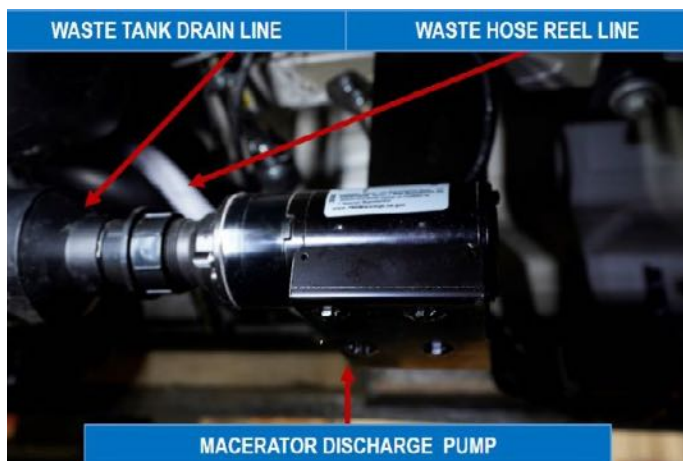
Always drain the black tank first, followed by the gray water tank. This helps to flush any remaining black tank waste from the drain hose and the coach's drain outlet assembly.



A portable macerator pump kit can make waste disposal a clean and easy operation. They are available for purchase through your American Coach dealership.

■ MACERATOR DISCHARGE PUMP AND REEL

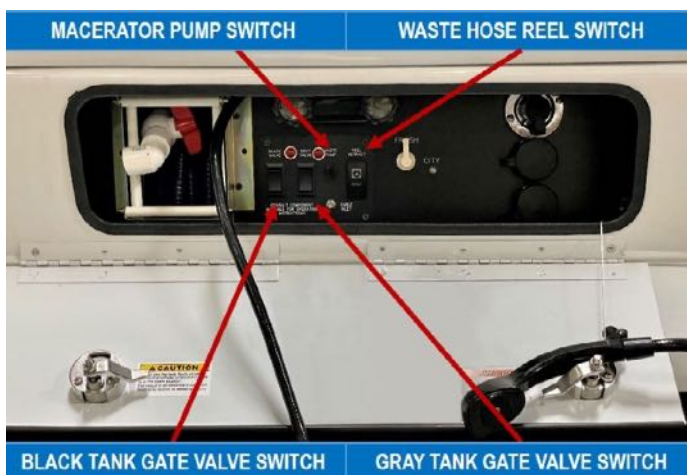
Your coach may be equipped with a permanently mounted 12-Volt DC macerator discharge pump and hose reel assembly, which will aid in the disposal of the contents of both the gray and black wastewater tanks. The waste discharge hose is accessed at the forward (left) side of the wet bay compartment. The macerator pump assembly is located beneath the vehicle, at the end of the waste tank drain line. The pump's discharge outlet connects via a short hose to the waste discharge hose and reel assembly.



The macerator pump's discharge output hose leads to the center hub of the waste hose reel assembly, which is permanently mounted behind the wet bay compartment beneath the coach.



Coaches equipped with the macerator discharge pump and reel assembly have remotely operated waste discharge gate valves. The electrically actuated remote waste discharge valves, along with the macerator pump and waste discharge hose reel are controlled by selector switches located inside the wet bay compartment.



■ REMOTE DISCHARGE GATE VALVES

Remote operated gate valves are located in line with the drain plumbing beneath the coach. The discharge of all waste is through a macerator pump and discharge hose assembly, located on the driver's side of the coach inside the wet bay compartment. **To drain the holding tanks with remote gate valves follow these procedures:**

STEP 1

Park the vehicle with the driver's side facing the RV pump out station waste receptacle or suction hose, making sure the vehicle is level;

STEP 2

Open the wet bay hatch. Momentarily press the bottom half of the "Retract / Release" rocker switch to release the hose spool's lock, and gently pull out the Shoreline® macerator discharge hose. Then connect the RV pumpout suction to the discharge hose;

STEP 3

Open the black tank gate valve by pressing and momentarily holding (about 3 to 4 seconds) the appropriate gate valve switch inside the wet bay compartment. The indicator light will illuminate to confirm that the gate valve is open. Waste water will flow into the pumpout suction hose. Allow the black tank to drain completely;

STEP 4

If a city water hose is available, connect it to the black tank flush fitting and turn on the water source to flush out any remaining waste in the black holding tank. Then turn off the water and close the black tank gate valve by pressing and holding the corresponding switch until the indicator light goes out;

STEP 5

Open the gray tank gate valve by pressing and momentarily holding (about 3 to 4 seconds) the appropriate gate valve switch inside the wet bay compartment. The indicator light will illuminate to confirm that the gate valve is open. Gray water will flow into the pumpout suction hose. Allow the gray tank to drain completely;

STEP 6

If a city water hose is available, connect it to the gray tank flush fitting and turn on the water source to flush out any remaining waste in the gray holding tank. Then turn off the water and close by pressing and holding the corresponding switch until the indicator light goes out;

STEP 7

Remove the pumpout suction hose. Press and hold the upper half of the "Retract / Release" rocker switch to retract the macerator discharge hose back onto the storage reel, being careful not to retract it too far which will jam the nozzle end into the storage reel's opening;

STEP 8

Close the wet bay hatch; and,

STEP 9

Add RV holding tank waste treatment and deodorizing solution or tablets / packets to the black tank through the toilet to ensure it is ready for use again.

**NOTE**

In the event the macerator pump should fail to start, remove the rubber cover on the end of the pump motor and use a flat blade screwdriver to turn the pump motor manually. This may free the pump and allow it to function properly.

**NOTE**

In the event a powered gate valve fails to open, you may manually open the valve by pulling the small 1" square aluminum actuator bracket away from the valve body to slide the gate valve open.

**DANGER**

Only use formaldehyde free holding tank treatment and deodorizing chemicals specifically approved for RV use. Formaldehyde is on the California Proposition 65 list because it can cause cancer. Formaldehyde exposure can cause leukemia, and cancers of the nose, throat, and sinuses.

**WARNING**

Do not press and continuously hold down the "Release" button on the hose reel, as this will cause the internal cord to unravel, which may jam the unit. Only press it momentarily to release the lock on the spool, and then pull the hose out.





SECTION 9

Electrical Systems



ELECTRICAL SYSTEMS

The American Coach Patriot interior combines an array of special equipment and appliances with the Mercedes-Benz Sprinter Van to deliver a high level of comfort, capability, and functionality.

The luxurious interior combines refined upholstery, cabinetry, equipment, and appliances designed to deliver many years of enjoyment with basic care and routine maintenance. Please read this section carefully along with the Mercedes-Benz Sprinter Operating Instructions. The procedures outlined below are intended to supplement (but do not replace) the owner's / operator's manuals associated with the interior equipment and appliances installed within your vehicle. This section will help you to set up and operate your coach. It will also help you to protect your investment and promote an optimal ownership experience with your luxury Class B coach.



NOTE

The procedures outlined in this section are representative of the typical coach layout, to include an array of features and equipment that accompany a wide range of models. Your vehicle may not have all or some features covered in this section. The equipment and appliances described and depicted may also be different from those originally installed in your coach, as product enhancements and changes are made over time.



NOTE

If you cannot find the information needed to safely operate your coach, if an appliance is not covered herein, or you require assistance with a specific function, please contact our Customer Service and Warranty Department at (574) 522-4878. A product technical advisor will provide you with assistance directly.



WARNING

A potential exposure risk exists to formaldehyde gas, which is contained in the furniture products used within this vehicle. Formaldehyde gas may cause leukemia and cancers of the nose, throat and sinuses. Over time it may slowly leech out of furniture and other products used to assemble this vehicle, especially under high temperatures. Refer to California Proposition 65 for additional information on formaldehyde gas exposure risks at:

<https://www.p65warnings.ca.gov>

■ FIREFLY SYSTEM MULTIPLEX CONTROLS

The American Coach Patriot is equipped with a Firefly Integrations system of functional control modules and touch-control user interfaces, which enable you to easily: control and monitor power distribution and sources; interior and exterior lighting; Heating, Ventilation and Air Conditioning (HVAC); and, monitor tank levels and systems status. The Firefly system forms the hardware backbone of a dedicated Control Area Network (CAN), which operates on the industry standard RV-C communications protocol. The majority of your coach's house electrical and electronics equipment are seamlessly integrated into the Firefly system, which provides for simplicity of operations, convenience, and reliability.

Depending on the model, your coach is equipped with up to three touch-control interface displays, which are located in the galley, dashboard, and rear bedroom areas of the vehicle. The master interface is prominently located on the passenger side of the coach directly adjacent to the side sliding door and galley area. This touch-control provides full access to all system controls and features, to include tank status monitoring.

To activate the Firefly interface, and to provide power to the 12 VDC equipment in your coach, you must first turn on power to the main display by pressing the "Battery" button / switch directly below the main interface. On some models, this will be a red LED illuminated rocker style switch.



The master interface provides up to five page views for Home, Lighting, Climate, Electrical, Auxiliary, and Settings. The number of page views on your coach will vary, depending on the year model and installed options.

HOME PAGE

The "Home" page view provides: house and chassis battery state of charge status; ambient temperature reading and an HVAC temperature setting touch-control; fresh, grey, black and LPG tank fill status; touch-control switching of tank heaters, the water pump, and the water heater; lighting master on / off control; and the ability to extend or retract the awning. Certain coach models also have a generator start / stop touch-control on the "Home" page.



LIGHTING PAGE

The "Lighting" page provides for master on / off touch-control of all lighting, and individual on / off touch-control of each fixture or category of lighting. Control icons are present for a varying array of fixture and lighting groups, which will vary by coach model and installed options. To turn a fixture or lighting group on or off, simply touch the associated icon on the display.



Icons with up / down arrows are dimmable by selecting that fixture or group and then touching the "Light Dim" button and selecting the desired lighting level.

The "Light Master" icon controls all associated interior lights simultaneously. When the "Light Master" Off icon is pressed, it will remember which lights were on, and will turn them off. Then, when the "Light Master" On icon is pressed, it will only turn on lights that are stored in memory. To turn on all of the lights again, press and hold the "Light Master" On icon for at least one second.



NOTE

The "Light Master" memory is rewritten each time the "Light Master" Off icon is pressed. If the Off icon is pressed twice in a row, it will remember that no lights were on. Therefore, the next time you touch the "Light Master" On icon, no lights will illuminate. Press and hold Light Master On to turn the lights back on.

The "Light Master" function will also remember the dimmable brightness level settings when the "Light Master" Off icon is pressed. "Light Master" memory and the individual light fixture or lighting group memory are two separate memories. For example, if a light is dimmed to 50% and switched off using the individual light fixture's icon and is then dimmed to 25% and turned off using the "Light Master", turning On with the individual fixture's icon will bring it on to 50% while turning it on using the "Light Master" On icon will bring it on to 25%.



WARNING

The Fog lamps are not tied to the chassis headlamp control. Failure to turn off the fog lamps after parking the coach could potentially result in a discharged House battery.

CLIMATE CONTROL PAGE

Your coach's HVAC system is controlled through the "Climate Control" page on the Firefly touch-control interface. The left side of the display will provide the ambient temperature, and up / down icon buttons to adjust the interior temperature setpoint. The right side of the display provides three to four rows of icons (depending on model options) to activate and control Heating, Air Conditioning, and fan functions.

Selecting the "Auto" mode will cause the HVAC system to activate the air conditioner or the ESPAR furnace to maintain an ambient temperature within 2° of the set point. The fan speed may be set to automatic by touching the "Auto" icon button, or to the desired speed.

Coaches equipped with the ProAir 12 VDC climate control system will switch between cooling and heating without the need to be connected to shore power or an LP generator, provided sufficient battery capacity exists to power the equipment.

HVAC "Auto" functions require a constant supply of DC battery voltage and / or diesel fuel to function without interruption. Do not leave children or pets in the vehicle unattended.



NOTE

Coaches equipped with the 125 VAC roof air conditioning unit will only function when the vehicle is plugged into a 30 amp shore power connection, or while the Onan LP generator is operating (if equipped). The inverter alone will not provide sufficient amperage to power the 125 VAC roof air conditioner. In order for the air conditioning to run, the temperature set point must be at least 2° below the ambient temperature reading.



NOTE

The diesel fueled ESPAR heater will always operate, provided sufficient 12 VDC power is present. Monitor the diesel fuel tank level to ensure you have a sufficient fuel supply. In order for the ESPAR furnace to run, the temperature set point must be at least 2° above the ambient temperature reading.



WARNING

Monitor battery bank and diesel fuel level status anytime the HVAC system is set to "Auto". Do not leave small children or pets in an unattended vehicle with HVAC set to "Auto". Should the system shut down for any reason it could result in serious physical injuries and /or death.

ELECTRICAL PAGE

The "Electrical" page provides control of manual generator starting and stopping, Automatic Generator Start (AGS), and the inverter. On models not equipped with AGS, the manual generator start and stop function is located on the "Home" page, and the inverter control is located on the "Auxiliary" page.



The "Electrical" page displays battery state of charge status for both the House and Chassis battery banks. The status color will change from green to red if the state of charge drops to an unacceptable level. A fully charged 12-volt battery bank should read approximately 13.6 to 13.8 volts. A battery displaying voltage below 12.6 volts indicates a low state of charge. When the coach's batteries are being charged, the voltage display may indicate as high as 14.3 volts, which is normal.

Your coach's electrical system will automatically switch between the chassis' 3.0 diesel engine powered alternator, shore power, the optional Onan LP generator, and the battery bank. While you are driving, the chassis 3.0 diesel engine will charge both the chassis and house battery banks. With the engine turned off, power will automatically switch to the house battery bank, unless the coach's optional Onan LP generator is started, or it is plugged into shore power.

To power the coach through the optional Onan LP generator, touch and hold the generator's "Start" icon button until the generator cranks and starts up. To stop the generator simply touch the "Stop" icon button. The display will indicate "Running" or "Stopped". The display also provides the total number of operating hours on the generator. See the LP GENERATOR section below for further instructions on the operation of the optional Onan LP Generator.

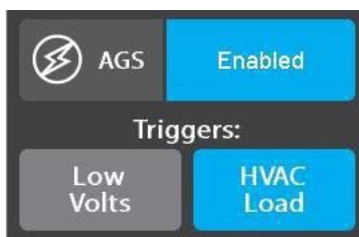
The "AGS Disabled" icon will display anytime AGS is not active. Tap the icon to enable AGS. A pop-up dialog box will appear which will

require an “Enable” icon button to be held for 3 seconds to confirm AGS activation.

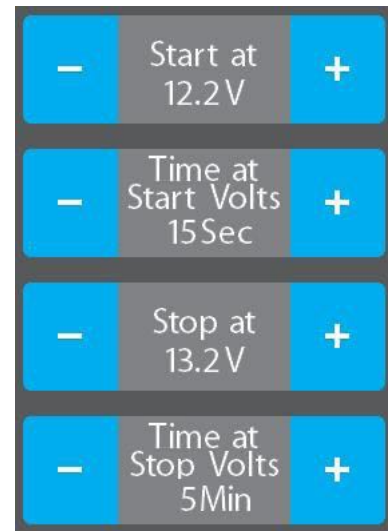
Touch the “Inverter” icon to power the inverter on or off. A blue “Inverter” icon indicates the unit is on. A grey “Inverter” icon indicates the unit is off. Keep in mind that the inverter will quickly deplete the house battery bank if the coach is not connected to shore power or another power source such as the chassis’ 3.0 diesel engine alternator or the optional Onan LP generator. See the INVERTER section below for further instructions on the operation of the inverter.

Your coach may have an “Energy Management” section on the “Electrical” page. The Energy Management System (EMS) will activate when the AC Power Management option is selected. EMS does not operate when connected to shore power, or whenever the generator is running. **Once activated, the EMS loads are shed according to the following priority order:**

1. **Dometic AirCon** - This is present if no ProAir options are enabled, or if ProAir Clutch is enabled without ProAir Variable;
2. **Convection Stove** - EMS will try to turn on this load (OFF ch. 10) as soon as the system starts if there is power. This will turn ON ch. 10 if the load is SHEDDING or OFF. There is no on-screen control for the induction cooktop; and,
3. **Water Heater** - This will turn ON ch. 15 if the load is SHEDDING or OFF. It will also turn the Water Heater icon button color to yellow if it is shedding with ch 15.



Tap the icon button to Enable or Disable AGS. A warning message will require action to Enable. Two “Trigger Options” are available to automatically start the generator using specified voltage settings (Low Volts) or when A/C or Heat starts (HVAC). Select one or both triggers. If no triggers are selected, AGS will not run. Disable HVAC Load while you are connected to shore power to prevent the generator from starting.



Set the trigger options as follows:

Start at Volts - The generator will start when the voltage drops to this set point depending on the “Time at Start Volts” setting below. (Available range is 10.5v – 12.5v);

Time at Start Volts - The generator will start when the voltage drops to the Start at Voltage for this specific amount of time. (Available range is 5 seconds – 1 minute);

Stop at Volts - The generator will shut off when the voltage reaches this set point depending on “Time at Stop Volts” setting below. (Available range is 13.2v – 14.5v); and,

Time at Stop Volts - The amount of time required for the voltage to remain at “Stop at Volts” level before the generator shuts off. (Available range is 5min – 120min).



Minimum Gen Run Time - Use the +/- buttons to set the minimum amount of time that your generator will run once it has started. (Available range is 10min – 30min);

Maximum Gen Run Time - Use the +/- buttons to set the maximum amount of time that your generator will run once it has started. (Available range is 120min – 300min); and,

Gen Start Retries - Use the +/- buttons to set the number of tries that your generator will retry to start. (Available range is 1-5 retries).



NOTE

EMS will attempt to start the LP generator no more than 5 consecutive times. This is for safety reasons and to prevent damage to the generator's starting motor and / or the battery bank. Read the GENERATOR section below for additional information.

AUXILIARY CONTROLS PAGE

The "Auxiliary Controls" page enables control of the internet router, speakers, and the satellite dish depending on the options installed on your coach. On some models, the Inverter function is also located on this page. To control each feature, simply touch the appropriate icon button once. The icon will turn blue when powered "On". It will turn grey when the option is powered "Off". Refer to the individual operating instructions for the inverter and satellite equipment installed on your coach for more detailed technical information, setup, variable settings, and troubleshooting guidance.

SETTINGS PAGE

The "Settings" page on the Firefly interface provides technical details pertinent to your specific coach model, along with the ability to connect to the system via a mobile App (optional), and to apply user adjustable settings such as: temperature units; display brightness; and, enter the cleaning mode.

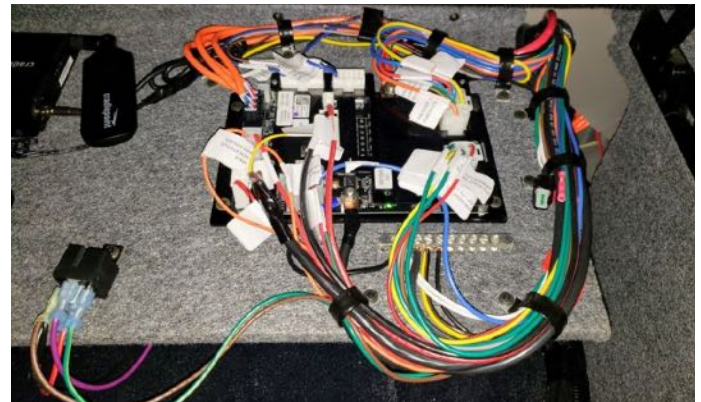


Touching the "Mobile App" icon button will open a Vegatouch Mira connection screen. Vegatouch Mira is a wireless control module that easily connects to any Android or iOS device to enable total control of many electrical, electronic and mechanical systems in your coach. You can pair any device with the coach's built-in interface to monitor and control a number of its features. The "Mobile App" feature is an option and may, or may not, be installed on your coach. If the icon does not appear in the "Settings" display, your coach is not equipped with this option.

You can change the "Temperature Units" display by touching the icon button that toggles between Fahrenheit and Celcius. The screen brightness may be set manually by touching and dragging the setting bar to the desired level, or by activating the auto dimming mode, which is useful for nighttime driving.

Touching the "System Diagnostics" icon button will display the status of the screen, the main G12 control panel (located in the rear of the coach) and Aircon. The G12 control panel is the power distribution center for the entire coach. It receives the signals sent from your Firefly interface control panels and performs the actions that have been requested by activating and deactivating the required circuits.

Simulated LED lights will be displayed for each currently active input or component. This information is valuable for any troubleshooting whenever a component is not operable or appears to be malfunctioning. An image of the G12 control module follows.



The "Floorplan" icon will display the active options installed on your coach. These settings should only be changed by a qualified technician at your American Coach dealership.

Touch the “Cleaning Mode” icon button once to momentarily lock the screen and disable touch controls for 15 seconds, which is long enough to clean the screen with a soft and lint free microfiber towel. Do not use chemicals to clean the display.

**NOTE**

The driver's position and rear Firefly displays provide some, but not all of the various control capabilities of the main display.

**WARNING**

The Firefly interface and network RV-C CAN Bus is a sophisticated system that should only be serviced by a qualified professional. Attempting to use a multi-meter or other diagnostic tools on the G12 control panel can damage the sensitive electronics, which may render some or all of the coach's equipment inoperable.

■ LIGHTING (INTERIOR AND EXTERIOR)

Your coach is equipped with an array of high quality and efficient 12-volt Light Emitting Diode (LED) light fixtures. All lighting, except for the front cockpit overhead lighting, is controlled through the Firefly network interface. Lighting controls are accessible at all three interface locations (main, front, and rear displays).

Interior lighting is configured into lighting groups, to include the front reading lights, galley lights, rear reading lights, and accent lights. Exterior lighting includes individual controls for the awing light strip, porch light, and the front fog lamps and under coach lighting (if equipped with these optional features).

Most of the LED lighting fixtures, and the accent lighting strips, do not have replaceable bulbs. The LED lighting components are durable, efficient, and will last a very long time. If you need a replacement assembly, they are available through an American Coach Dealership.

Interior and exterior lighting controlled through the Firefly network does not have a time out feature similar to that associated with most automotive interior dome lights. If left on, the lighting will not turn itself off, which will reduce the life expectancy of the LED fixtures. This could also draw down the house battery state of charge if the vehicle is not plugged into shore power.

■ 12 VOLT DC SYSTEM

12-volt power is delivered through two integrated distribution networks within the vehicle (chassis and house). Chassis 12-volt power is provided through the Mercedes-Benz chassis' electrical system and is generated (primarily) by the 3.0 turbocharged diesel engine's alternator. House 12-volt power is provided by one of several means: the shore power connection, which provides 12-volt power through the inverter; the Onan LP generator (if equipped); the battery bank (AGM or Lithium); or, the 3.0 turbocharged diesel engine's alternator (or a second under-hood generator if equipped with this option).

The house electrical system is controlled through the coach's Energy Management System (EMS), which senses power loads (demand), and then selects among available power source(s) to provide current (supply). The EMS uses relays and / or solenoids to select among the available power sources using the following priority sequence: 1 – the 3.0 turbo diesel engine if it is running; 2 – shore power if the coach is plugged in; 3 – the Onan LP generator (if equipped); and, 4 – the AGM or Lithium battery bank.

The Mercedes-Benz Sprinter chassis has its own separate 12-volt electrical power distribution hub. This electrical distribution hub provides 12-volt power to the vehicle's various systems and networks, to include: 3.0 turbocharged diesel engine management; powertrain control; chassis lighting; infotainment; steering and braking; and, passenger safety systems. Please refer to the Mercedes-Benz Sprinter Operating Instructions for more detailed information on the location of the various power distribution panels, fuses, and 12-volt electrical components associated with the chassis. Service of these components should be performed by a Mercedes-Benz dealership.

■ MASTER DISCONNECT

Power to the 12-volt house distribution hub is controlled by the master power “Battery” switch, which is located directly below the main Firefly network interface display. As noted in the previous section on the Firefly network, the “Battery” switch is either a backlit round button type (as displayed above in the Firefly section of this chapter) or a red LED illuminated rocker switch depending on your model. This switch must be set to “on” whenever you wish to power the Firefly display and any 12-volt DC electrical loads on the house side of the coach. When the coach is not in use, especially during periods of long-term storage, the switch should be set to “off”. The switch may be left “on” when you are using the coach or are away for brief periods of time. Below is an image of the illuminated LED rocker style master “Battery” switch.

Regardless of the "Battery" button / rocker switch setting (On or Off), the inverter will always charge the batteries as needed, provided the coach is plugged into a 120-volt shore power source.



NOTE

Leaving the "Battery" switch set to "on" will allow lights and equipment in the coach to draw power from the house battery bank, which could deplete the state of charge if you are not connected to shore power or do not have the optional LP generator running. Turn the switch to "off" when you will not be using the coach and during long term storage.

A separate power On / Off switch is also located directly beneath the main Firefly display to provide 12-volt DC power to the refrigerator. This switch may be turned "On" and will provide power to the refrigerator, even if the "Battery" switch is set to "Off". Please refer to SECTION 10 (APPLIANCES) for detailed instructions on how to operate the refrigerator.



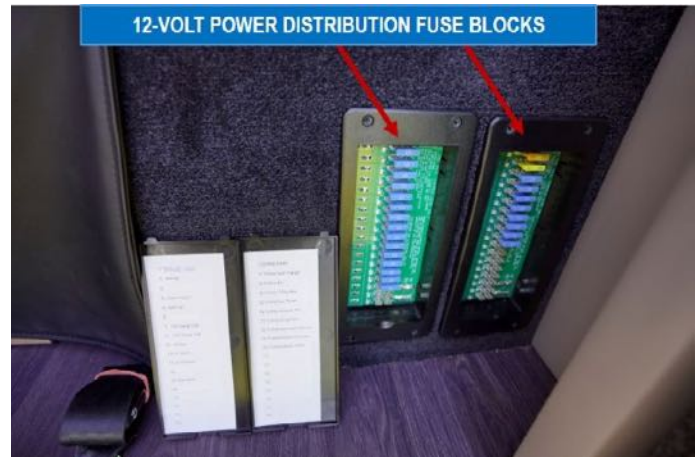
NOTE

Leaving the "Refrigerator" switch set to "on" will allow the refrigerator to draw power from the house battery bank at all times, which could deplete the state of charge if you are not connected to shore power or do not have the optional LP generator running. Empty the refrigerator and turn the switch to "off" when you will not be using the coach and during long term storage.

FUSE BLOCK - LOCATION AND IDENTIFICATION

Your coach has a 12-volt power distribution hub located at the rear of the coach. Depending upon the chassis model and installed options, your coach will have one or two distribution panels that contain individual fuses for house equipment and lighting powered by 12-volts of DC current. The panels have a snap-in plastic cover which is easily removed with a flat blade screwdriver or a coin, inserted into the slot at the top of the cover.

Some equipment will have in-line fuses at the component to provide additional protection (example: solar panels have an in-line fuse located in the wiring harness directly under the solar panel on the coach's roof). The inverter also has its own special high-current fuse, which is located adjacent to the inverter.



BATTERY TYPES AND CHARGING REQUIREMENTS (AGM / LITHIUM)

Your coach is equipped with a single Absorbed Glass Matt (AGM) house battery, or six LiFePO4 "Lithium" batteries depending upon the installed options. Each battery type has a unique charging profile, characteristics, service, and performance limitations. The inverter must be properly set depending upon the type of battery(s) installed in your coach. These settings were established at the factory before your coach was delivered so you do not need to adjust them. They should only be changed by a properly qualified technician, and only if the type of battery(s) installed in the coach are modified (for example: you decide to exchange the AGM battery for Lithium batteries).

Routinely monitor the state of charge on both the house and chassis batteries by checking the main Firefly display periodically. AGM batteries should not be deeply discharged below 50% of their rated amp hour capacity. Doing so will damage the battery, reducing its capacity and life expectancy. LiFePO4 "Lithium" batteries may be repeatedly discharged to nearly 10% of their fully rated capacity without damaging them.

AGM batteries are more tolerant of cold weather and will charge below freezing ambient temperatures. Charging effectiveness will drop as temperatures decline below freezing. Coaches with AGM batteries are not equipped with insulating blankets or heaters.



LiFePO4 "Lithium" batteries are less tolerant of sub-freezing temperatures. Their integrated battery management system will prevent them from charging below 25°F. For this reason, coaches equipped with the Freedom Lithium® package include a battery insulating blanket with heating pads to aid in charging the batteries under very low ambient temperature conditions.



Please refer to the following table for state of charge and approximate voltage readings for both types of batteries.

BATTERY STATE OF CHARGE	LiFePO4 APPROXIMATE VOLTAGE	AGM APPROXIMATE VOLTAGE
100%	14.60+	13.00+
90%	13.4	12.75
80%	13.3	12.5
70%	13.2	12.3
60%	13.1	12.15
50%	13.05	12.05
40%	13	11.95
30%	12.9	11.81
20%	12.8	11.66
10%	12.05	11.51
FULLY DISCHARGED 0%	10	10.5



NOTE

The battery management system integrated into the LiFePO4 batteries installed in coaches equipped with the Freedom Lithium® package will prevent charging below 25°F to prevent damaging the batteries.

Batteries should be removed from the coach for when the vehicle will be placed into long term storage for several months, or in situations where persistent extended sub-freezing cold ambient temperature conditions are likely. It is not necessary to remove the batteries if the coach will be connected to shore power during storage. **If the batteries are removed from the coach, follow these procedures:**

- STEP 1** Disconnect the 120-volt shore power cable from the coach.
- STEP 2** Place an opaque blanket or cover over the solar panels and remove the Solar Panel fuse at the 12-volt power distribution block. Store the fuse for reuse after you replace the batteries.
- STEP 3** Turn off all battery loads inside the coach, and the master "Battery" switch at the Firefly display.
- STEP 4** Each LiFePO4 "Lithium" 12-volt 100 amp hour battery weighs approximately 31 pounds, and there are six of them connected in parallel (to produce 12 volts & 600 amp hours) on a Freedom Lithium® equipped coach. The single large 330 amp hour AGM battery weighs approximately 170 pounds and will require a lift to be removed safely.

Store them in a well ventilated, cool and dry location where they will not be subjected to freezing or excessively high temperatures. Batteries should be in a fully charged state before placing them in long term storage. They will self-discharge slowly over time (up to 5% monthly depending upon the battery type). Therefore, they will benefit from a trickle charge or a brief recharging cycle on a monthly basis while in storage. Batteries are heavy. Each LiFePO4 "Lithium" 12-volt 100 amp hour battery weighs approximately 31 pounds, and there are six of them connected in parallel (to produce 12 volts & 600 amp hours) on a Freedom Lithium® equipped coach. The single large 330 amp hour AGM battery weighs approximately 170 pounds and will require a lift to be removed safely.

**NOTE**

When testing the state of charge of a battery, make sure there is no load on the battery and that it is disconnected from any charging source. Batteries should be tested when at "rest", having had an opportunity to fully cool down and settle after charging.

**WARNING**

Should you need to remove a battery for any reason, make certain the coach is disconnected from any 120-volt AC power source, as the inverter could be in charging mode, which may cause serious physical injuries, burns, and / or damage to the coach.

**WARNING**

Remove the 12-Volt Solar Panel fuse and cover the solar panel(s) with an opaque blanket before attempting to remove the house battery(s). The solar charger is connected directly to the house battery(s) and may cause an electrical shock, burns, and / or damage to the solar charging system if it is not disconnected.

**WARNING**

Because of its significant weight, we recommend the large AGM battery be removed by a properly certified professional at an authorized dealership. Attempting to remove the battery without the proper lifting equipment could result in serious personal injury and / or damage to the battery.

Your inverter is connected to a special battery separator / combiner solenoid located in the rear of the coach near the inverter. This device will isolate or combine the house and chassis batteries when they are being discharged or charged. Whenever the house battery(s) are not being charged, the solenoid isolates the chassis and the house batteries. This will protect your chassis battery from accidental discharge by any house current loads. When the coach's inverter is charging the house battery(s), the solenoid will combine the chassis battery with the house battery(s) to charge it as well. Once both battery banks reach a fully charged state, or if power is removed from the inverter, the solenoid will isolate the house and chassis batteries.

The rate of battery charging depends upon a variety of factors to include: outside ambient temperature; age and condition of the battery(s); condition of the battery cables; and, the total combined load that is placed on the house battery bank during charging. Your inverter will attempt to charge the batteries anytime it is connected to 120-volt shore power, or if the optional Onan LP generator is running. However, if the load being placed on the house battery(s) exceeds the charging capacity, the battery(s) will take longer to recharge or may not charge at all. Heavy loads such as the refrigerator, lights, or running the convection / microwave oven while attempting to recharge the batteries will limit the available charging amperage to replenish them.

If you suspect the batteries are not charging, perform the following:

STEP 1 Turn off all 12-volt loads.

Turn off the inverter at the Firefly display. This will ensure the inverter is not converting 12-volt DC power to 120-volt AC current while it is attempting to charge the batteries. The charging function of the inverter will always operate, even when it is set to "Off" at the Firefly display.

STEP 3 Check to ensure the 120-volt shore power cord is connected to an active 30 amp power source.

STEP 4 If operating the optional Onan LP Generator, check to ensure the generator's circuit breaker has not been tripped. (Refer to GENERATOR section below).

If your coach is equipped with the optional Automatic Generator Start (AGS) capability, your coach will start the optional Onan LP Generator anytime it senses the battery(s) have dropped below the established "Start At" voltage set point as noted in the ELECTRICAL section above.

**DANGER**

Always disable the Automatic Generator Start (AGS) feature if your coach will be parked inside a garage or other enclosure. The AGS could start the generator without warning, leading to high carbon monoxide levels, and resulting in potential serious injuries and / or death.

**WARNING**

Should the coach's chassis battery become deeply discharged, do not use a high current charger or power boosting device to start the coach, as this may damage sensitive electrical components. Refer to the Mercedes-Benz Sprinter Operating Instructions before attempting to jump start the chassis battery.

■ BATTERY LOCATIONS (CHASSIS AND HOUSE)

As previously noted, your coach has two separate 12 volt electrical systems (chassis and house), which are supported by batteries to provide reserve energy to start the 3.0 liter turbodiesel engine, the optional Onan LP generator (if equipped), and to provide reserve power capacity for lighting and other purposes.

■ CHASSIS BATTERY

The chassis battery is located under the floor, directly beneath the driver's position. This maintenance free type Absorbed Glass Mat (AGM) battery is accessible for inspection, cleaning, and replacement by following the instructions in the Battery section of the Mercedes-Benz Sprinter Operating Instructions.

Should the chassis battery become deeply discharged, or incapable of providing sufficient power to start the vehicle, refer to the Starting Assistance and Charging the 12 V Battery section of the Mercedes-Benz Sprinter Operating Instructions. Pay close attention to the battery safety and maximum charging voltage warnings. Only replace the battery with an exact fit and type as specified by Mercedes-Benz.

**NOTE**

The chassis battery is used to start the 3.0 diesel engine in your coach, and to power the vehicle's exterior automotive lights, interior cab dome light, and the chassis' electrical system. The chassis battery does not power the house lighting system, appliances, TVs, roof air conditioner, water pump, awning, or any of the other 12 volt components which are controlled through the Firefly interface.

**DANGER**

A risk of explosion exists when charging a weak, deeply discharged, leaking, cracked, or frozen battery. Read the complete Battery section of the Mercedes-Benz Sprinter Operating Instructions and / or seek professional assistance before attempting to charge your chassis battery. Do not charge a battery indoors, or in a poorly ventilated area. A potential battery explosion will cause significant property damage and could result in serious physical injuries and / or death.

**WARNING**

Risk of damage to the chassis battery and vehicle electronics from overcharging. Use only automatic and regulated battery chargers with a maximum charging voltage output of 14.8 Volts.

**WARNING**

Damage to the diesel catalytic converter and diesel particulate filter may result from numerous unsuccessful attempts to start the coach's diesel engine due to non-combusted fuel. Avoid numerous repeated and extended attempts to start the engine.

**WARNING**

Damage to the vehicles sensitive electronics may result from incorrectly removing and replacing the chassis battery. Refer to the Disconnecting the Starter Battery section of the Mercedes-Benz Sprinter Operating Instructions before attempting to remove and / or replace the chassis battery.

■ HOUSE BATTERY

The "House" battery in your coach powers the Firefly interface displays and network, the fresh water pump, macerator pump, power awning and awning LED light strip, coach interior lighting and exterior porch light, the rear coach entertainment stereo system, power folding rear seat, ceiling fans, USB power ports, and other 12-volt DC powered electrical appliances. If equipped with the Freedom® Lithium package, your LiFePO4 house battery bank will also power the 12-volt DC roof air conditioning unit.

Your house battery will consist of either a single large capacity AGM battery, or LiFoPO4 batteries (up to 6 total if the coach is equipped with the optional Freedom Lithium package). The chassis size (144 vs 170 / 170 EXT) will also determine the physical size, storage capacity, and mounting location of the house battery(s). **See table below.**

CHASSIS	AGM	LITHIUM	LOCATION	SIZE	QUANTITY
144	X		Under Hood	70ah	1
144 ECO		X	Behind Rear Axle	100ah	6
170	X		Forward of Hitch	8D-330ah	1
170 ECO		X	Behind Rear Axle	100ah	6
170 EXT	X		Forward of Hitch	8D-330ah	1
170EXT ECO		X	Behind Rear Axle	100ah	6

When connected through the coach's inverter, the 12-volt power stored in the house battery may also be converted into 120-volt AC energy to power the microwave / convection oven, the front and rear TVs, Blue Ray player (if equipped) and the coach's WiFi router and Apple TV module. It will not provide sufficient amperage to power the 120-volt AC roof air conditioner (Only applies to coaches without the Freedom® Lithium package).

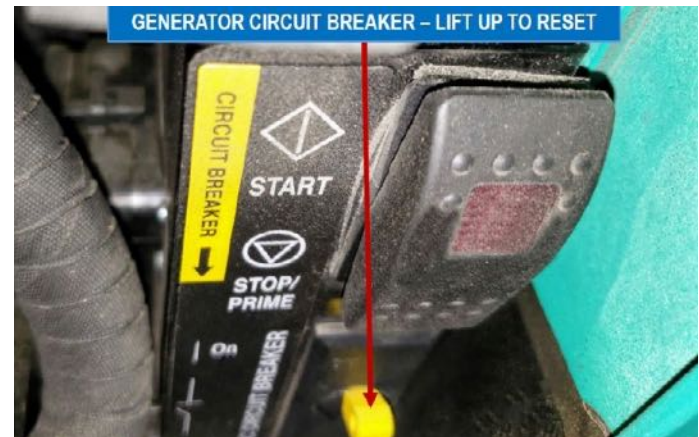
■ USB CHARGING PORTS

Universal Serial Bus (USB) charging ports are located throughout the coach to provide for the convenient recharging of cellular phones and other small devices requiring 12-volt power. The USB ports located behind the driver's compartment (forward cab of the vehicle) are all powered through the coach's house battery(s). The USB ports located in the dashboard of the vehicle are powered by the chassis battery. The dashboard USB ports are of the USB-C variety, whereas all other ports throughout the coach are of the standard USB-A type.

■ LPG GENERATOR

Your coach may be equipped with the optional Onan QG 2500 LP Generator, which will operate on Liquid Propane Gas (LPG) to produce up to 2500 watts of 120-volts AC power (a maximum of 20.8 amps @ 3,600rpm). The LP generator is fully integrated into your coach's electrical system. It is mounted beneath the vehicle and directly behind the rear axle. Please read the Onan RV Genset

Generator Operator's Manual completely before proceeding to start or run the LP generator.



Use clean and fresh HD-5 grade Liquid Propane Gas (LPG) containing at least 90% propane to operate the generator. Some commercially available LPG may contain up to 2.5% butane, which may make starting difficult in cold temperatures (below 32°F).

The generator is started and stopped primarily from the Firefly network interface display. It may be activated manually or via the AGS (if your coach is equipped with this option). It may also be started or stopped using the generator's Start / Stop rocker switch, located behind the service access hatch on the generator.

Before you start the generator perform the following safety checks:

- STEP 1** Make sure the Carbon Monoxide (CO) detector is functioning properly and close any windows directly above the generator exhaust.
- STEP 2** Inspect the exhaust system to make sure it is in good condition and is not obstructed.
- STEP 3** Check for any signs of a fuel leak. LPG has a distinct odor and is easily detectable.
- STEP 4** Ensure the generator is not obstructed or sitting too close to the ground. It must have good airflow around the unit to cool properly. It must also never be operated in contact with standing water.
- STEP 5** Turn off the air conditioner and the inverter to ensure no major appliances are running at startup.

■ STARTING THE LP GENERATOR

After performing the safety checks above, you can proceed to start the generator as follows:

- STEP 1** Press and hold the "Start" icon button at the Firefly display. This will engage the electric starter to turn over the generator.
- STEP 2** Once the generator starts, allow it to warm up to operating temperature. This will take a few short minutes depending on the outside ambient temperature.
- STEP 3** Check again for any fuel or exhaust leaks and to ensure there are no obstructions that could cause exhaust gasses to enter the coach.
- STEP 4** If you started the generator using the rocker switch at the generator itself, replace the and lock the service access hatch.

With the generator running normally and warmed up, you may begin to apply electrical loads. Start appliances that consume the highest starting amperage first, such as the roof air conditioner. Do not exceed the total maximum amperage load (20.8 amps) or the circuit breaker on the generator will trip. As electrical loads are applied, the tone of the generator exhaust sound will deepen, indicating it is now operating under load.



WARNING

Do not engage the start button for more than 10 seconds. Allow 30 seconds between starting attempts. Refer to the "Troubleshooting" section of the Onan RV Genset Operator's Manual if it fails to start. Excessive cranking will damage the generator's starter motor.

Before shutting down the generator, remove the heavy loads so that it has an opportunity to cool down. This will reduce premature wear on the internal components and seals on the generator. Run the generator for at least two minutes without a load (up to 5 minutes under high ambient temperature and humidity conditions).

To manually stop the generator, touch the "Stop" icon button on the Firefly network display, or press the rocker switch on the generator down to stop it. If the AGS is active, it may attempt to immediately restart the generator if the battery bank is at or below the "Start At" voltage.

Excessive loads will cause the circuit breaker on the generator to trip. This is designed to protect the generator from damage. **Should you need to reset the breaker, follow these procedures:**

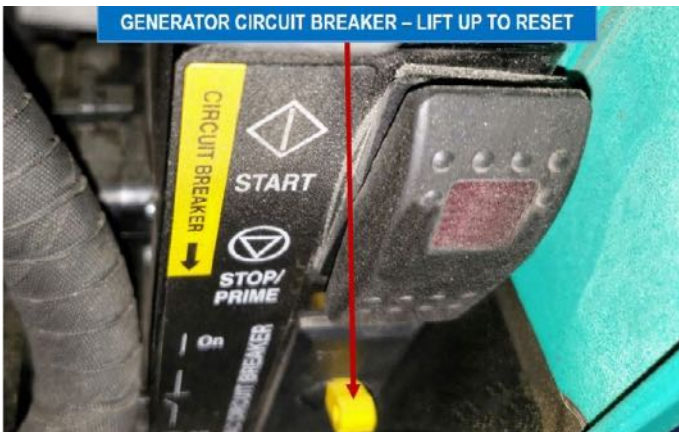
STEP 1

Remove the service access hatch from the generator, using a flat-blade screwdriver or a coin. Twist the lock ¼ turn counterclockwise to open and remove the cover. For coaches equipped with the Onan QG 2500i LP Generator simply turn the thumb latch. Gently set it aside.



Applies to coaches equipped with the Onan QA 2500 LP Generator. Reach inside the lower right corner directly beneath the manual "Start / Stop" rocker switch and lift up the circuit breaker reset tab. Be careful not to accidentally engage the "Start / Stop" rocker switch as it will cause the generator to crank over and start. If this happens, simply press "Stop" on the rocker switch.

STEP 2A



Applies to coaches equipped with the Onan QA 2500i LP Generator. Reach inside the upper right corner directly beneath the manual "Start / Stop" rocker switch and slide the circuit breaker reset tab. Be careful not to accidentally engage the "Start / Stop" rocker switch as it will cause the generator to crank over and start. If this happens, simply press "Stop" on the rocker switch.

STEP 2B



Replace the service access hatch by first engaging the retention tabs at the top of the cover with the generator housing. Then press the lower edge of the cover inward until the cover is flush with the generator housing. Turn the locking latch ¼ turn clockwise with a flat-blade screwdriver or a coin and check to make sure the cover is secure. Or simply rotate the thumb latch on the Onan QG 2500i Generator.

STEP 3

Refer to the FIREFLY SYSTEMS MULTIPLEX CONTROL, ELECTRICAL section above for instructions on how to program the optional Automatic Generator Start (AGS) functions.

■ INVERTER

Depending on the installed options, your coach is equipped with the Xantrex® Freedom XC 2000 or XC 3000 pure sine wave inverter. The inverter will convert 12-volts of DC electrical current into 120-volts of AC current power appliances, and to provide household electrical current to the GFCI outlets both inside and outside of the coach. The inverter (pictured below) is capable of producing either 2000 or 3000 watts of 120 VAC power, and it is installed in a compartment at the rear of your coach beneath the power fold-down bench seat.



The inverter is controlled through the Firefly main interface display as noted earlier in this chapter. Some coaches are equipped with the optional Xantrex® remote control module, which replicates the controls found on the inverter's exterior housing. **The remote-control module is pictured below.**

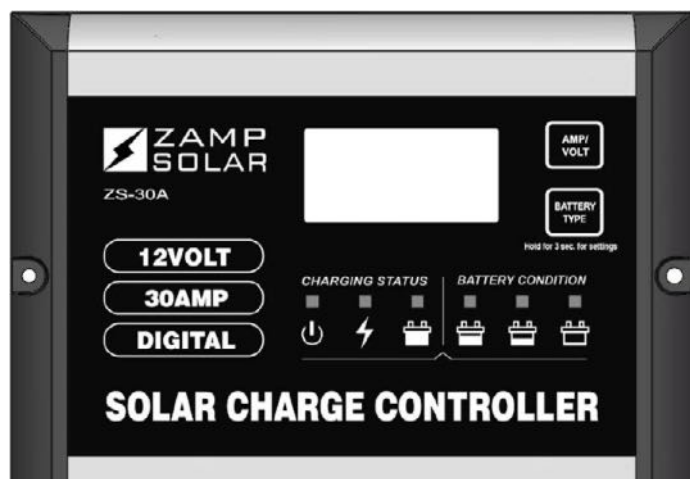


Turn on the inverter at the Firefly interface touch-control whenever you desire to operate 120-VAC appliances (such as the convection oven), TVs, or other plug-in appliances. It will operate off the house battery, the generator, and shore power. The Inverter will also charge your house and chassis battery banks whenever you are plugged into shore power or are operating the optional Onan LP generator. The inverter will not produce sufficient power to operate the roof top 120-VAC air conditioner unit.

■ SOLAR CHARGING SYSTEM (CHARGE CONTROLLER / PANELS / FUSES)

Your American Coach Patriot is equipped with a ZAMP solar charge controller and either a single solar panel, or multiple solar panels, depending on its configuration. The ZS-30A accepts up to 25 volts of solar input and will deliver up to 30 amps of charging current to the house battery bank. Coaches with the 330-amp AGM battery receive up to 125 watts of solar charging power from a single rooftop mounted solar panel via the ZS-30A controller. Coaches equipped with the optional Freedom® Lithium package deliver 320 watts of 12-volt DC power from three rooftop solar panels in parallel through the ZS-30A to a bank of six 100-amp hour LiFePO4 Dragonfly Energy® batteries.

The ZAMP solar charge controller is located in or near the galley area and displays the charging state and battery charging status on its integrated LCD display. The charge controller only charges the house battery bank. It will not charge the chassis battery. **See image below.**



The LCD Display and two main control buttons are located on the top half of the ZAMP Solar Controller. The "BATTERY TYPE" button allows the user to set the type of batteries installed in the house bank.

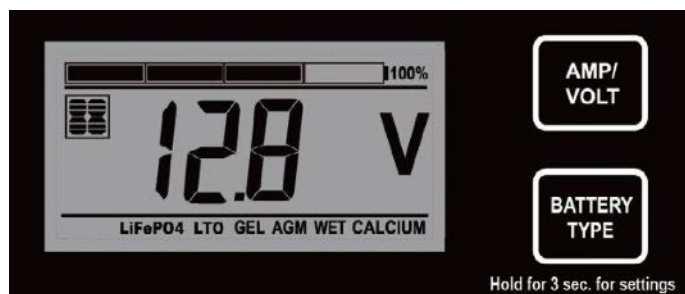
The appropriate battery type setting was established at the factory and should not be changed, unless the type of batteries installed in the coach have been changed. To change the battery type, press and hold the button for three seconds to enter the new type of battery. The unit provides 6 battery type options for selection: LiFePO4, LTO, Gel, AGM, WET (conventional lead acid), and Calcium.



NOTE

Use only AGM or LiFePO4 batteries in your coach, preferably of the same type and capacity as originally installed. If you change battery types for any reason, remember to update the inverter settings as well to avoid damaging the batteries or under charging.

The "AMP/VOLT" button toggles between a display of the total solar power produced by the rooftop solar panels in amp hours, or the battery(s) combined voltage. **See image below.**









You also can visually monitor your battery charging condition for each battery; there is an LCD bar at the top of the display that depicts the percentage of charge in four increments (25%, 50%, 75% or 100%).



The ZAMP Solar Controller utilizes a five-stage charging protocol: Soft Charge (Level 1); Bulk Charge (Level 2); Absorption Charge (Level 3); Equalizing Charge (Level 4); and Float Mode (Level 5). This charging method optimizes the condition of your house battery(s). The time spent at each stage will vary based on the condition of the battery(s), temperature, and any loads being placed on them. Individual charging levels may not be bypassed and must progress through a complete stage before the unit will advance to the next stage of charging.

The lower portion of the ZAMP Solar Controller displays a series of LED indicators for Charging Status and Battery Condition. **Refer to the following chart for the operational LED indication.**

The 6 LED's indicate the charging status and the battery condition						
Solar Power Present-No battery connected	ON	OFF	OFF	OFF	OFF	Flash
Soft charging	ON	Flash	OFF	OFF	OFF	ON
Bulk charging	ON	ON	OFF	Subject to battery voltage		
Absorption charging	ON	ON	OFF	ON	OFF	OFF
Equalization charging	ON	ON	OFF	ON	OFF	OFF
Float charging	ON	OFF	ON	ON	OFF	OFF
Solar panel weak	Flash	OFF	OFF	Subject to battery voltage		
At night, no charge	OFF	OFF	OFF	Subject to battery voltage		
Battery Voltage below 11.5V (+/-0.2V)	ON	ON	OFF	OFF	OFF	ON
Battery Voltage between 11.5V - 12.5V(+/-0.2V)	ON	ON	OFF	OFF	ON	OFF
Battery Voltage above 12.5V (+/-0.2V)	ON	ON	OFF	ON	OFF	OFF



DANGER

This unit should only be serviced by a certified electrical technician. Accidental shorting of the wiring terminals on the reverse side of the ZAMP ZA-30A Solar Charge Controller or wiring can result in a fire, and / or severe physical injuries.



DANGER

Never disconnect the input leads from the solar panel(s) without first covering each solar panel with an opaque blanket or covering. Solar panels will generate energy anytime they are exposed to the sun. Touching the bare positive lead from a solar panel array can cause an electric shock, resulting in severe physical injury and / or death.



WARNING

Setting the incorrect battery type on the ZAMP Solar Controller may permanently damage your house battery(s).

■ 120 VOLT AC SYSTEM

Your coach has a 120-volt Alternating Current (AC) electrical system in addition to the 12-volt Direct Current (DC) system. The 120-volt AC system services high voltage appliances such as the 13,500 btu roof top air conditioner, the inverter, the convection / microwave oven, and the induction cooktop.

The coach is equipped with a 120-volt AC power distribution hub located at the right rear side of the coach beneath the ottoman seat. This distribution panel contains household circuit breakers to safely distribute 120-volts of AC power to each individual appliance in the vehicle.

See the following image of the power distribution hub with its circuit breakers. A label is fixed inside the door cover to identify each circuit.



120-volt AC power is furnished to the coach via a 30-amp shore power cable, which is plugged into the driver's side rear outlet. The outlet and cable are a twist lock configuration to ensure a positive connection and safe retention of the cable. The service end of the shore power cable should be plugged into any properly grounded 30 amp 120-volt AC power source to provide power to the coach. Alternatively, 120-volt AC power may also be produced locally on the coach through the optional Onan QG 2500 LP Generator.

The 120-volt AC power cord utilizes an L5-30 standard twist plug and outlet configuration in accordance with the National Electrical Code.



Your RV shore power cable has three conductors inside the heavy duty protective outer sheath. One is a safety ground (designated with a "G"). One is the neutral wire (designated with a "W"). The third conductor is the positive or "hot" wire. Therefore, all shore power cables and outlets are polarity sensitive and must be properly wired for your coach to receive safe and reliable 120-volt AC shore power.



WARNING

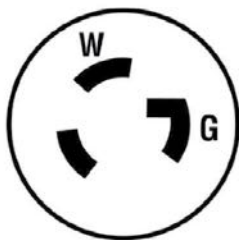
It is possible for the neutral and positive wires in a power pedestal or outlet to be accidentally reversed. This is usually evidenced by an equipment malfunction. In this situation, disconnect from the power source immediately to prevent an electrical shock and / or damage to your coach's sophisticated electrical system.

The following image depicts a standard NMEA L5 connector. Each end of the cable has a specific plug or outlet (male / female) pattern. The coach side will be of the L5-30 pattern, while the source side will ordinarily be a TT-30 pattern. Note the following image depicts the L-5 plug end, as designated with a "P" to denote the "plug" side of the cable. The plug side of the cable has molded openings which allow the permanently fixed prongs inside the coach's outlet to enter the cable end. The cable has a special keyed end to ensure the plug is properly oriented as it enters the outlet. Once the plug is fully seated into the coach's outlet, turn it roughly 1/8 turn clockwise to lock the plug in place.

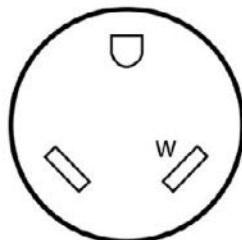


DANGER

Never alter a shore power cable, which could result in a severe electric shock and / or death.



L5-30P



TT-30R

The opposite end of the cable has a standard NEMA TT-30 RV connector, rated at 120-volts and 30 Amps.

When you are not connected to shore power secure the coach's outlet cover by gently aligning the cover with the outlet and carefully threading it onto the cover. Do not over tighten the cover to avoid damaging the threads.

The American Coach Patriot provides several Ground Fault Circuit Interrupter (GFCI) safety outlets at various locations throughout the coach. These outlets are typically located as follows: adjacent to the galley (on the side of the sink base cabinet); at the front of the coach near the convection / microwave oven; near the floor on the driver's side second row of seating (MD4) beneath the rear bench seat; behind the rear TV; behind the optional front TV; inside the left rear ottoman seat; and on the outside rear of the coach behind a weatherproof cover. Actual locations may vary according to your particular model. Please refer to the detailed electrical diagram for your coach model in SECTION 14 (SCHEMATICS) of this manual.



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SECTION 10

Appliances



APPLIANCES

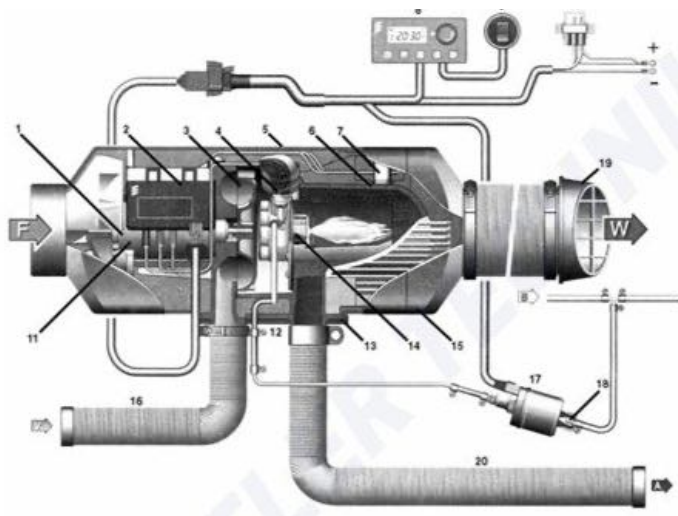
■ ROOF MOUNTED AIR CONDITIONERS (12 VDC AND 115 VAC)

The American Coach Patriot is equipped with either the 13,500 BTU Dometic 125 VAC roof mounted air conditioner, or the optional 20,000 BTU ProAir 12 VDC roof (if your coach is equipped with Lithium Package). Both units are highly efficient at maintaining a quality comfort level within the vehicle. With routine care and maintenance they are trouble free.

■ CABIN HEATER

Your coach is equipped with either the ESPAR Airtronix D2 or the ProAir D3 forced air furnace and climate control system, depending on the model and options installed. Both units operate on diesel fuel from the Mercedes-Benz Sprinter's onboard fuel tank. The unit is located at the driver's side rear of the coach beneath the power folding rear bench seat. A small louvered vent cover is located adjacent to the furnace, which should never be blocked or restricted.

The ESPAR and ProAir diesel furnaces operate similarly. Ambient air enters the unit through the intake (F) and is passed through the furnace by its internal blower where it is heated. Heated air exits from the outlet (W) and ventilates into the coach through a vent located at the bottom of the driver's side rear ottoman seat.



1	Intake-air impeller	14	Combustion chamber
2	Control unit	15	Outlet hood
3	Combustion air impeller	16	Combustion air hose
4	Glow pin	17	Fuel metering pump
5	Cover	18	Filter built into the fuel pump
6	Heat exchanger	19	Hot air outlet
7	Combi flame / overheating sensor	20	Flexible exhaust tube
8	Module clock		
9	Change-over switch heating / ventilation optional	F	Fresh air
10	Fuse carrier with main fuse and switch fuse	W	Hot air
11	Electric motor	A	Exhaust gas
12	Fuel connection	V	Fuel
13	Flange seal	B	Combustion air

Both units utilize the vehicle's internal diesel fuel and electrical power supply to produce heat without idling the vehicle. The advantage of using a diesel heater over Liquid Propane Gas (LPG) is that diesel is a "dry" fuel source, meaning it will not cause moisture to build up inside the vehicle.

These heaters are quite efficient as they can run under average conditions for approximately 24 hours on one (1) gallon of diesel fuel. Actual fuel consumption will depend upon the size of the coach, the interior thermostat temperature setting and the outside ambient temperature. Be aware that your diesel furnace will slowly draw down the coach's fuel tank level over several days, so you may need to fill up before overnighting for an extended period in a remote area.

Both the ESPAR and ProAir units are combustion heaters, so it is important to inspect your Carbon Monoxide (CO) Detector prior to every trip in accordance with SECTION 4 – SAFETY. When using the diesel furnace for the first time, you may detect a slight burning odor emanating from the unit inside the coach. This is normal during the break in period, and the odor will disappear after the unit has operated for a while. You may also notice some temporary white smoke coming from the heater's exhaust pipe at the driver's side rear of the coach. This is normal at startup and the smoke should rapidly clear once the unit achieves full power. Persistent smoke is an indication that the heater requires service.



NOTE

Your cabin heater draws from the same diesel fuel supply as the engine in your coach. Always check the fuel level daily to ensure you will have sufficient fuel to return from any remote camping area.

■ ESPAR FURNACE

The ESPAR Airtronix D2 furnace is primarily controlled from the main Firefly network interface display. It may also be controlled by the front and rear Firefly displays.

To activate the heater follow these procedures:

STEP 1

Select the Climate Control page from the Firefly network interface display;

STEP 2

In "Auto" mode, the climate control system will sense the ambient temperature and will compare it to the temperature setpoint on the Firefly display. The system will then select between heat and air conditioning, and will automatically power on the appropriate equipment; the ambient temperature and will compare it to the temperature setpoint on the Firefly display. The system will then select between heat and air conditioning, and will automatically power on the appropriate equipment;



NOTE

In "Auto" mode, the ESPAR furnace may be operated without being connected to 120-Volt AC shore power, and without the optional Onan LP Generator running. The house battery bank provides 12-Volt electrical power to the furnace unit and the fan. It will operate as long as a sufficient charge remains in the battery bank. It will also operate with the Mercedes-Benz 3.0 turbo diesel running, as long as the coach has a sufficient fuel supply.



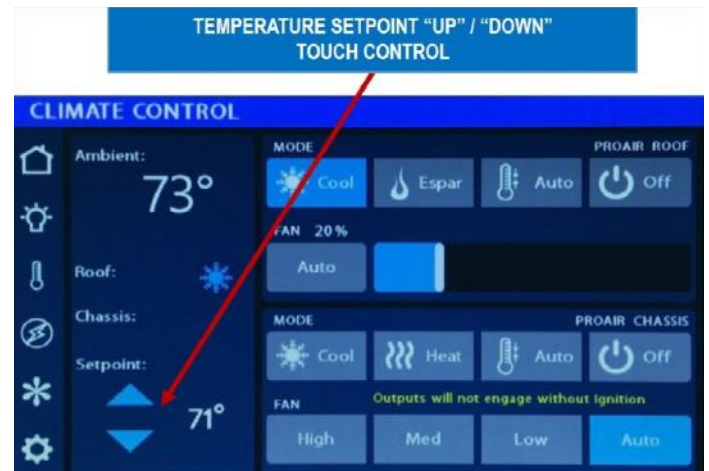
WARNING

Operating the furnace off the house battery bank will reduce the state of charge over time. Monitor battery bank charge status periodically to avoid a deeply discharged battery. You will eventually need to recharge the batteries from shore power, the generator, or by running the coach's engine.



STEP 3

Using the Firefly touch screen, establish the desired temperature setpoint with the "Up" / "Down" arrow icon buttons. Regardless of the chosen operating mode ("ESPAR" or "Auto"), the furnace will operate until the interior temperature reaches the desired setpoint;



STEP 4

To promote maximum comfort, you may set the fans speed to either "Auto", "High", "Medium", or "Low" speed. You may also manually adjust the fan speed incrementally depending on the model heater installed on your coach. If your coach has the fan speed manual adjustment slide bar option, simply touch and drag the fan speed bar to the desired level; and, the ambient temperature and will compare it to the temperature setpoint on the Firefly display. The system will then select between heat and air conditioning, and will automatically power on the appropriate equipment;

STEP 5

To turn the furnace "Off" touch the "ESPAR" icon button on the Firefly display and the color should change to gray, indicating the unit is off.

■ PROAIR FURNACE

The ProAir furnace is operated separately from the Firefly network interface display. This unit is controlled directly from a dedicated control unit, mounted on the coach's wall. The location of the control varies depending on the coach model.



Follow these steps to turn the ProAir furnace on or off, and to set the interior temperature to the desired level. Please note that ProAir units do not have a variable speed fan.

STEP 1 Turn on the ProAir furnace by pressing and holding the power button for 3 to 5 seconds, until the temperature display illuminates with the current temperature;

STEP 2 To set the desired temperature, press and hold the power button 1 to 2 seconds and release the key. Then rotate the knob to the desired temperature setpoint, and press the power on / off button again to store the desired temperature setpoint;

STEP 3 Once you have set the desired temperature setpoint, you may push the power on / off button again to return to the switch back to the current ambient temperature display. The furnace will activate to increase the coach's interior temperature to achieve the setpoint, and it will stop once it reaches the desired setting;

STEP 4 To turn the furnace off, press and hold the power on / off button for 3 to 5 seconds until the display turns off.



NOTE

Your cabin heater and the fan will continue to run for a short period after being turned off. This is a cool down cycle and is normal.



NOTE

The furnace should be turned off when the coach is not in use to conserve fuel and reduce unnecessary wear on the unit.



DANGER

Risk of Carbon Monoxide (CO) Gas poisoning. Never operate the cabin heater inside a garage or enclosed area, adjacent to walls and fences, or where exhaust gasses from the furnace may be directed back into the coach, which could result in serious physical injuries and / or death.



DANGER

Risk of fire. Before operating the cabin heater, check the outside surroundings to ensure tall grass and leaves are not in close proximity to the exhaust outlet, which could cause a fire, resulting in property loss, physical injuries and / or death.



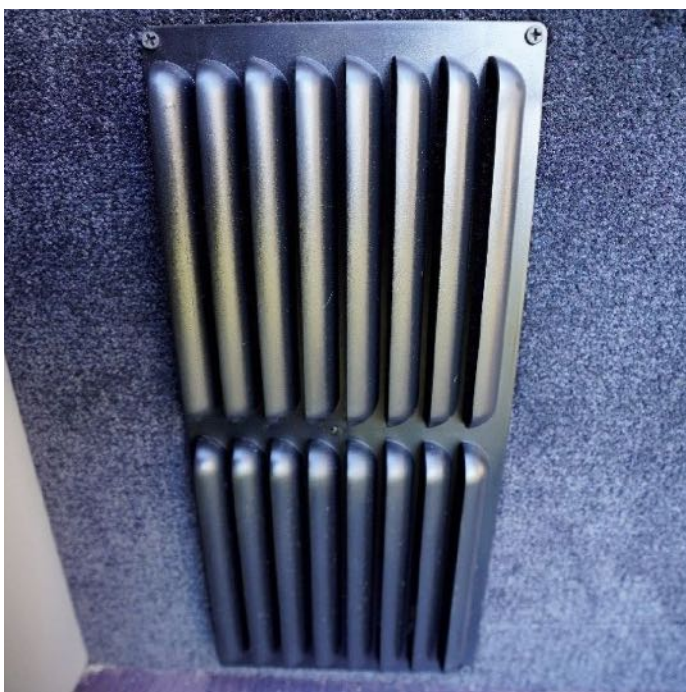
DANGER

Do not leave unsupervised small children and pets in the coach with the heater on. A child could accidentally change the heater setpoint, creating unsafe conditions, which could result in serious injuries and / or death.



WARNING

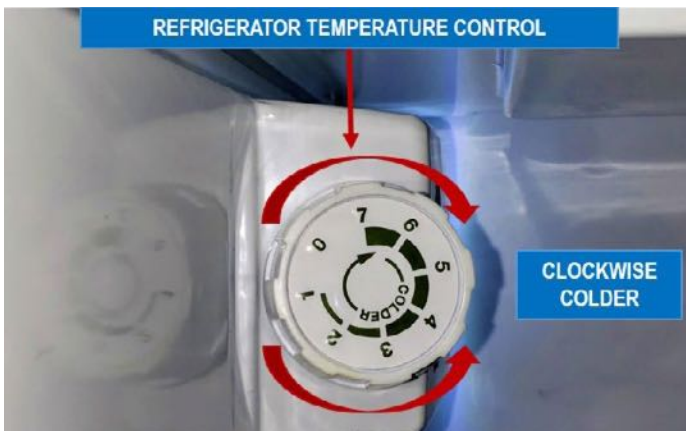
A small louvered vent is located adjacent to the diesel furnace on the driver's side of the coach beneath the rear power-folding bench seat. Never block or restrict this vent as it is essential for the furnace to operate properly. Blocking the vent could cause the furnace to malfunction, overheat, or reduce the heater's output air flow.



■ REFRIGERATOR

Depending on the coach model and installed options, your American Coach Patriot is equipped with either a 3.5 or 7.3 cubic foot Nova Kool refrigerator. These high quality refrigerators are very efficient, and operate on 12-Volt DC power, furnished by the house battery bank.

All Nova Kool units are supplied with a wide-range thermostat that is designed to sense the evaporator (cold plate) temperature. The coldest position on the thermostat is reached by turning the knob to the right (clockwise); turning the thermostat knob to the left (counterclockwise) yields a warmer setting. The OFF position is reached by turning fully counterclockwise past the “click” position (or by turning off the “FRIDGE” button / switch).



To operate your coach's refrigerator follow these procedures:

STEP 1

Turn on the unit by pressing the “FRIDGE” power button or switch, which is located at the main Firefly network interface display is in the “on” position. Some coach models will have a round “FRIDGE” power button, while others have a rocker style switch.

STEP 2

Set the refrigerator's thermostat between 3 and 4. You can make further adjustments to suit your personal requirements after the unit has cooled down. Allow the refrigerator to come down to temperature before loading with product; and,

STEP 3

Gradually adjust the thermostat to the desired setting.



NOTE

Setting the refrigerator's thermostat to a much lower number than the desired temperature setting will not decrease the time required for the unit to reach the desired cooling point.

VENTILATION

Your refrigerator was installed to ensure proper ventilation. Always keep the area around the unit unobstructed. Maintaining clearance in front of the refrigerator is an important consideration. All refrigerators are heat transfer appliances which transfer heat from the inside of the cabinet through the evaporator, compressor, and refrigerant to the condenser on the outside of the cabinet.

To aid in ventilation and efficient operation, your coach may have a louvered vent installed above and / or below your refrigerator unit. If your coach is equipped with a louvered vent(s) do not cover or restrict them. It is a good idea to periodically vacuum the vent openings as well to remove any accumulated lint and / or dust. Some coaches may not have a vent, depending on the floor plan and installed options.

Below is a typical vent installed directly above the refrigerator.



Your refrigerator may also have a safety catch on the door latch to help ensure the door never opens accidentally while your vehicle is in motion. This simple latch rotates left or right to lock or unlock the door. You must first move the latch left to the unlocked position, and then you may open the door open with the handle.



To promote the longevity of your Refrigerator, please read the DEFROST AND CLEANING chapter in SECTION 13 – MAINTENANCE.

Your refrigerator may be fitted with the optional 120-volt AC / 12-volt DC module, which enables the unit to select between AC & DC power. The unit will always run on AC power whenever it is available. Should the AC power be disconnected there is a one-minute time delay before the unit switches over to running on DC power. When AC power is reestablished there is no delay, and the unit will immediately switch back to AC power.

■ CONVECTION / MICROWAVE OVEN

The American Coach Patriot comes equipped with a High Pointe Convection / Microwave oven, located in the galley area of the coach. This high quality unit has an easy cleaning stainless steel interior and exterior finish to promote good looks and easy cleaning.



SPECIFICATIONS

Model	EC028KD7
Rated Voltage	120V~60Hz
Rated Input Power (Microwave)	1500W
Rated Output Power (Microwave)	1000W
Rated Input Power (Grill)	1150W
Rated Input Power (Convection)	1500W
Oven Capacity	1.1 Cu.ft (28 Litre)
Turntable Diameter	12.4 inch (315 mm)
External Dimensions	20.47 X18.7 X 14.76h (520X475X375 mm)
Net Weight	Approx 45.41 Lbs (20.6 kg)

Follow the High Pointe Microwave Instruction Manual procedures carefully when setting up your oven. **Read the manual carefully, and refer to the parts and accessories diagram below:**

Names of Oven Parts and Accessories

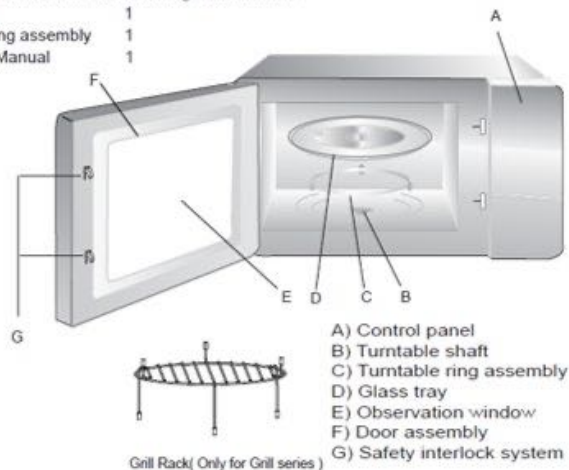
Remove the oven and all materials from the carton and in the oven cavity.

Your oven comes with the following accessories:

Glass tray 1

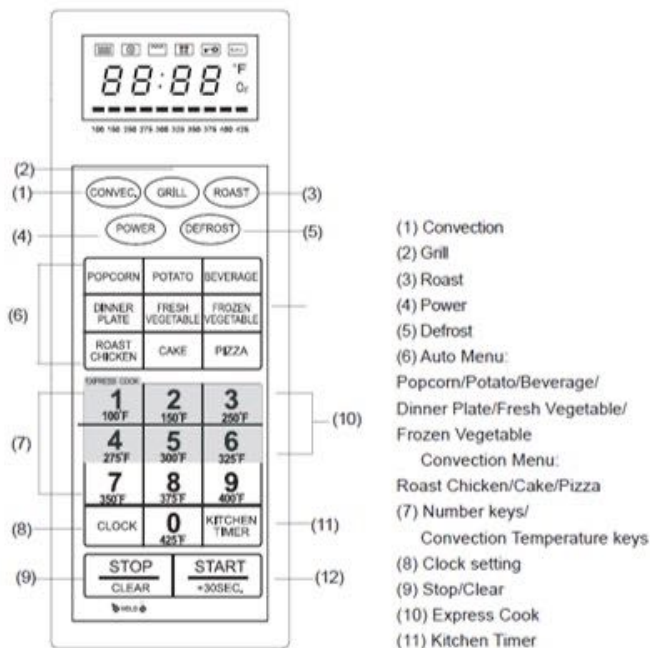
Turntable ring assembly 1

Instruction Manual 1



Shut off oven power if the door is opened during operation.

Refer to the keypad diagram below when setting up and operating your High Pointe convection / microwave oven.



The convection / microwave oven requires 120-Volt AC power to operate. Therefore, you can power the unit while connected to shore power, while running the optional Onan LP Generator, or through the inverter, using power from the house battery bank. To operate the unit off the house battery bank the inverter must be set to "on".

Follow these procedures to operate your High Pointe convection / microwave oven:

STEP 1

Provide 120-Volt AC power to the unit. If you are not connected to shore power and are operating off the optional generator or the house battery bank, set the inverter to "On" at the main Firefly network interface display. Please refer to the INVERTER chapter of SECTION 9 – ELECTRICAL SYSTEMS.

While referring to the control pad diagram, start by setting the clock. When power is first applied to the microwave oven, the clock will display "0:00", and a buzzer will ring once. To set the time:

1. Press the "Clock" button, and the buzzer will ring once;
2. Press the number keys for the desired time; and,
3. Press "Clock" to finish the clock setting. ":" will flash, and the time will light.

If the clock is not set, "0:00" will be displayed. If you press "Stop/Clear", the oven will go back to the previous status automatically.

STEP 2

Set the Kitchen Timer:

1. Press "Timer", the display will show "0:00";
2. Press the number keys for the desired time between 99 minutes and 99 seconds;
3. Press "Start / +30SEC" to initiate the time count down; and,
4. When the time count down reaches "0", the buzzer will sound 5 times and the oven will return to the normal state.

When using the timer, the oven will not start with any other program, and the oven light will not illuminate.

STEP 3

Select Microwave Cooking Power Level. There are 10 power levels available. Follow these steps to select the desired microwave power level and set the cooking time:

STEP 4

1. Press the "Power" button once, and the oven will display "PL10";
2. Continue to press the "Power" button until you reach the desired power level;
3. Press the number buttons to set the cooking time; and,
4. Press "Start/+30SEC" to start cooking. The ":" will light and the "Micro" indicator will flash.

MICROWAVE POWER LEVELS

Level	Power	Display
10	100%	PL10
9	90%	PL9
8	80%	PL8
7	70%	PL7
6	60%	PL6
5	50%	PL5
4	40%	PL4
3	30%	PL3
2	20%	PL2
1	10%	PL1



NOTE

Read the High Pointe Microwave Oven Instruction Manual thoroughly before attempting to operate the unit. Please read all stated safety and warning precautions listed in the manual.



DANGER

Avoid possible exposure to excessive microwave energy. Do not attempt to operate the convection / microwave oven with the door open since this can result in harmful exposure to microwave energy. It is important not to break or tamper with the safety interlocks. Doing so can result in serious burns and / or other physical injuries.



WARNING

Before operating the convection / microwave oven your vehicle must be stationary and parked on a level surface. Failure to do so could cause liquid food items to spill inside the unit, resulting in damage to the coach, and potential injuries to vehicle passengers.



WARNING

Do not attempt to operate the convection / microwave oven while running the 120-Volt AC roof air conditioner unless you are connected to a 30-amp shore power outlet. The optional Onan LP Generator does not produce sufficient power to operate the air conditioner and the convection / microwave oven simultaneously, which will trip the generator's internal circuit breaker.

■ INDUCTION COOKTOP

A True Induction® Single Burner Cooktop is installed in the galley of your American Coach Patriot. Depending on your coach model, the cooktop is either mounted directly on top of the countertop, or it may be recessed beneath a removable countertop cover. Induction cooktops are particularly well suited to recreational vehicle use, as the burner itself does not heat up. This means there will be less chance of an accidental fire or burn injuries while cooking in your coach.

Your induction cooktop uses 120-Volt AC electric current to directly heat your pots and pans through magnetic induction. This requires the use of specially designed "induction" cookware. Ordinary pots and pans will not work with an induction cooktop as they lack the required metal plate on the bottom of the cooking vessel.



Induction cooking requires pots and pans that are made of ferrous (meaning magnetic) materials. Check your cookware's retail box or the bottom of the pot or pan for this induction symbol.

Instead of using thermal energy from a hot heating element or gas burner that is placed beneath the pot or pan, the magnetic influence of the cooktop causes inductive heat to build up in the cooking vessel itself. The energy transfer occurs nearly instantly and is highly efficient.

How do you tell if your cookware is induction ready if you are unable to find the symbol on the cookware? Simply take a magnet and see if it will stick to the bottom of the pot or pan. If it holds firmly, that cookware item will likely function on your induction cooktop. If the magnet does not stick firmly, that cookware item is not suitable.

A wide range of induction ready cookware is available from most home goods stores. You can also purchase induction cookware directly from True Induction via their website at: <https://www.trueinduction.com/>



[Additional-Resources.aspx#Manual](#)



To operate your True Induction® Cooktop, please refer to the image above, and follow these step-by-step procedures:

STEP 1 If your cooktop is recessed into the countertop, carefully remove the cover and store it in a cabinet where it will not be damaged;

STEP 2 Provide 120-Volt AC power to the unit. If you are not connected to shore power and are operating off the optional generator or the house battery bank, set the inverter to "On" at the main Firefly network interface display. Please refer to the INVERTER chapter of SECTION 9 – ELECTRICAL SYSTEMS.

STEP 3 Turn power on by pressing the "ON/OFF" touch key once. The power light indicators will turn red and the unit will start heating if a proper ferromagnetic pot or pan is being used;

STEP 3 Set the temperature. There are two heat setting options; Quick touch level selection (setting 1 through 10); and, exact temperature settings (150 °F - 450 °F);

STEP 4 To set the quick touch level heat setting, press the "+ / -" touch key, until the desired heat level is achieved. The default is set to level 5;

STEP 5 To select a specific temperature setting, press the "temp" touch key and watch for the temperature light to turn red. Then press the + / - touch key until the desired temperature level is achieved. The default setting is 270°F; and,

STEP 6 After cooking is completed, press the "ON/OFF" touch key again to turn the unit off.

To use the timer function follow these steps:

STEP 1 Press the "Timer" touch key, it will default to '0' on the display;

STEP 2 Press the "UP or DOWN" touch key repeatedly to set the cooking time. The time can be set in 5-minute increments up to a maximum of 150 minutes. Once set, the timer counts down in 1-minute intervals

STEP 3 A beep will sound when the cooking time has finished, and the cooktop will switch over to standby mode. After cooking is completed, press the "ON/OFF" touch key to turn the unit off.

To ensure the cooktop is operating effectively be sure to follow these easy maintenance and cleaning procedures:

STEP 1 Before cleaning make sure the cooktop is off and the surface is completely cool;

STEP 2 Using a damp lint free microfiber towel with some dishwashing liquid, wipe the entire surface of the unit clean. Rinse the towel and wipe away any soap residue;

STEP 3 For stubborn or burnt on food residues, dampen the surface and use a plastic razor blade to scrape away any residue. (Use a plastic blade);

STEP 4 Dry the cooktop surface with a soft clean towel, being careful not to scratch the finish;

STEP 4 Use a glass-ceramic safe cleaning product to clean and polish the cooktop surface once each week; and,

STEP 5 For recessed cooktops, use a vacuum to remove any dust, crumbs, or food particle build-up inside the cooktop recess area, which will also improve airflow and cooling.

SPECIFICATIONS

True Induction Single Burner Cooktop Model TI-1B	
Power	1600W
Voltage	120V ~ 60Hz
Temperature Range	150°F - 450°F
Level Selection	1 through 10
Max Time	150 Minutes
Material	Glass Ceramic Top
Dimensions	11 13/16" width x 14 15/16" length x 2 13/16" height



DANGER

Never leave cookware unattended with the induction cooktop in the "on" mode. Should the contents of the cooking vessel overheat it could result in damage to the cooktop and / or a fire, resulting in serious damage to the coach, burns, serious physical injuries and / or death.



DANGER

Never operate the unit if the cooktop surface is damaged or cracked. This is an unsafe condition that could cause a fire, electrocution, serious burns, physical injuries and / or death.



WARNING

Before operating the True Induction® cooktop your vehicle must be stationary and parked on a level surface. Secure all cookware before moving the coach. Never operate the vehicle while cooking, which could lead to a sudden spill of hot food or liquid inside the vehicle, resulting in potential damage to the coach, burns, or other serious injuries to vehicle passengers.



WARNING

Keep the recessed area of your cooktop free of crumbs, dust, and debris. Do not store anything on the cooktop surface inside its compartment, as this could damage the unit.



SECTION 11

Infotainment System



INFOTAINMENT SYSTEM

The infotainment system in your coach is designed to envelop you with expertly crafted audio-visual capabilities and sensations that are only available in an American Coach Patriot. The premium quality components that comprise this fully integrated network of sight, sound, and information connectivity will surround you with endless hours of enjoyment, relaxation, and the ability to stay connected while on the road.



Depending upon the factory options installed in your coach, a vast array of premium quality digital component awaits your command to deliver superior stereo, reliable digital off-air TV, Apple TV, and full internet connectivity via an onboard wireless hub.

The high technology components that comprise this impressive infotainment system are described in the pages that follow. Please be sure to read each individual component's individual operating manual / instructions in addition to the information provided within this manual. This section will describe how to operate the major components of your coach's infotainment system. Please keep in mind that some components and procedures may vary slightly depending upon your installed options.



NOTE

American Coach Dealerships are capable of helping you maximize the creative use of the sophisticated electronic equipment that is installed within your coach. Some audio and video equipment may require software or firmware updates following their initial activation. Please consult the individual equipment owner's manual / instructions for how to download any necessary updates or contact your American Coach Dealership service department directly for assistance.



NOTE

This section is applicable to the electronic equipment and components installed in the American Coach Patriot at the time of its writing. Audi-video components and features are occasionally subject to change and the equipment in your coach may vary slightly from what is described in this section.



DANGER

Never operate the audio-video equipment in your coach at sound volume levels that could distract the driver, which could result in a crash, serious physical injuries and / or death.



WARNING

The audio-video system in your coach should only be serviced by a qualified technician. Modifying the audio-video equipment installed in your coach (for example, adding additional speakers, subwoofers, or amplifiers) could damage the system, which will not be covered under warranty.

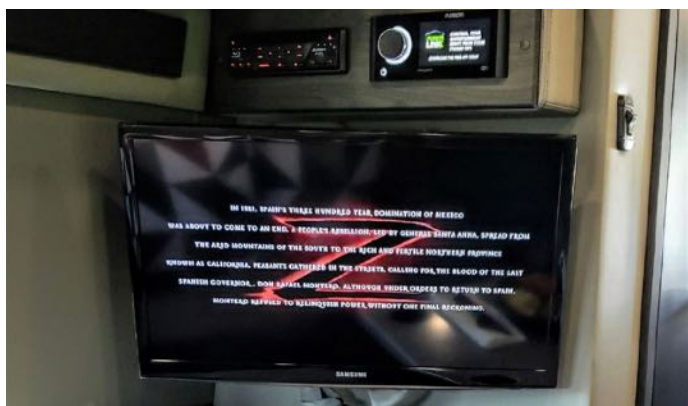


WARNING

Turn off all audio-video equipment when the coach is not occupied. Leaving equipment turned on without the coach being connected to 120-Volt 30 amp AC shore power, or without running the optional Onan 2500 LP Generator, could cause the coach's house battery bank to become deeply discharged. Check the house battery bank's state of charge periodically and recharge it as necessary.

■ TV OPERATION

The American Coach Patriot has one or two TVs installed in the coach, depending on the floor plan and factory options for your specific model. The TVs installed in the coach require 120-volt AC power to operate. Before attempting to turn on a TV, the coach must be connected to 120-volt shore power, or have the optional Onan LP Generator running, with the inverter set to "On" at the main Firefly network interface display.



You may also operate the TVs off the house battery bank with the inverter turned “on”, while stationary or while traveling with the 3.0 turbo diesel engine running. When operating the TVs off the house battery bank alone, keep close watch on the battery bank’s state of charge to avoid deeply discharging the battery over several hours of use. **Follow these steps:**

- STEP 1** Provide 120-Volt power from the shore power cable, the optional Onan LP generator, or the battery bank via the inverter;
- STEP 2** Make sure the inverter is set to “On” at the main Firefly network interface display;
- STEP 3** Use the appropriate remote control and turn the TV(s) on;
- STEP 4** Use the remote control to select the signal source (TV antenna, HDMI1, or HDMI2);
- STEP 5** Make sure the FUSION® Apollo™ RA-770 stereo is set to the same source as the TV;
- STEP 6** Adjust the volume of the coach speakers at the FUSION® Apollo™ RA-770. **Do not adjust the volume of the front TV as this may cause distortion in the audio system;**
- STEP 7** When operating both the front and rear TVs simultaneously, you may select the same source input on the rear TV, or chose a different source for the rear TV and adjust its volume independently of the FUSION® Apollo™ RA-770.



NOTE

When using the TV antenna signal, the TV(s) must be programmed to receive the local area channels. Follow the menu setup procedure in the LG or Samsung Owner’s Manual(s) as appropriate to properly program the antenna based channels into each TV.



NOTE



The rear TV is attached to a swivel arm mount. To release the mounting lock and reposition the TV, pull down on the ring and chain suspended behind the center of the TV.

■ **FUSION® Apollo™ AUDIO SYSTEM**

The heart of your coach’s audio-visual (AV) system is the FUSION® Apollo™ RA-770 touch screen digital media receiver with built-in WiFi. This versatile AV receiver delivers 26 watts RMS and 70 peak watts of power to the two pairs of flush-mounted JL Audio speakers installed in the front and rear areas of your coach. The unit will operate on 12-volt DC power and you can play back AM, FM, or USB based audio without the inverter being set to the “On” position.

Please read the FUSION® Apollo™ RA-770 Owner’s Manual carefully before proceeding to operate the unit. The available input sources have already been programmed into the unit at the factory before your coach was delivered. There is no need to alter them. Simply follow the instructions below to operate your audio system.



FUSION® APOLLO™ RA-770		
DEVICE	SOURCE ICON	
AM TUNER	AM	
FM TUNER	FM	
BLUETOOTH®	BT	
USB DEVICE	USB	
BLUERAY PLAYER	HDMI1	Aux 1
APPLE TV	HDMI2	Aux 1
AIR CHANNELS	Coaxial Aux 1	

To operate the unit, please read the FUSION® Apollo™ RA-770 Owner's Manual completely and then follow these procedures:

- STEP 1** Make sure the coach master battery power button / switch is set to "On" at the main Firefly network interface display. Then press the power icon button on the front left corner of the FUSION® Apollo™ RA-770 display. The unit will go through a brief power initiation cycle;
- STEP 2** Select the input source by touching the source icon button (Number 2). See the FUSION® Apollo™ RA-770 image and the device / source table above. The unit will display the current source in the lower left corner of the LCD display. To change the source, briefly touch the current source icon, and the source selection screen will appear. You may then select the desired source by touching the associated icon on the touch screen; and,
- STEP 3** Turn the dial (Number 1) to adjust the volume to a pleasant level; and,
- STEP 4** Use the previous or next double arrow keys to: go back or forward to the next audio file; or to change the channel selection as needed.

**NOTE**

The audio sources in your infotainment system are connected to inputs located at the rear of the FUSION® Apollo™ RA-770 unit. HDMI cables are connected between the optional Blue Ray player and the TV in your coach. If you have multiple TVs, they are connected via a splitter and HDMI cables. The splitter is located inside the compartment behind the Blue Ray player and the FUSION® Apollo™ RA-770 unit. The Apple TV+ device is located beneath the passenger side ottoman seat. It also provides signal to the TV(s) via a splitter and HDMI cables.

CONNECT / PLAYBACK A USB DEVICE

You can connect a USB device to the FUSION® Apollo™ RA-770. This will enable playback of MP3, AAC, or FLAC audio files. The USB device must be formatted using the FAT32 or NTFS file format. The USB input is compatible with most iPhone and Android™ devices.

Follow these procedures to playback audio files from a properly formatted USB device:

- STEP 1** Insert the USB device into the remote USB port directly adjacent to the FUSION® Apollo™ RA-770 display. Other USB devices in the coach are for charging purposes only and are not connected to the FUSION® Apollo™ RA-770;
- STEP 2** Select the "USB" input source by touching the source icon button (Number 2) and then touching the USB icon. Playback will begin immediately;
- STEP 3** Turn the dial (Number 1) to adjust the volume to a pleasant level; and,
- STEP 4** Use the previous or next double arrow keys to go back or forward to the next audio file.

**NOTE**

The remote USB port located directly adjacent to the FUSION® Apollo™ RA-770 unit is the only USB port connected to the stereo. Other USP ports throughout the coach provide charging capabilities only. A USB port located in the chassis dashboard allows playback of compatible audio files through the Mercedes-Benz infotainment system, which is controlled separately and is not integrated into the house infotainment system.

■ BLUE RAY PLAYER

If your coach is equipped with the optional Autopro Blue Ray player.



To play movies follow these procedures:

STEP 1

Provide a 120-volt AC power source (shore power or the optional Onan LP generator). Alternatively use the house battery bank;

STEP 2

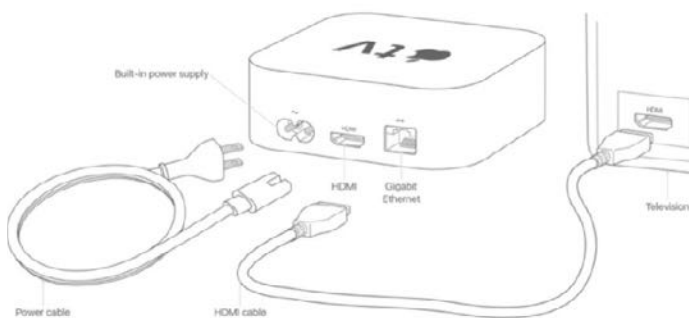
Turn the inverter "On";

STEP 3

Turn on the TV(s) and select the HDMI1 source to view the Blue Ray movie.

STEP 4

Select HDMI1 on the FUSION® Apollo™ RA-770 to play back the movie's audio using the Blue Ray player; and,



STEP 5

Use the Blue Ray player remote control to playback any compatible DVD or Blue ray disc.

When you are finished watching a movie you may use either the remote control or the touch buttons on the Autopro Blue Ray player to eject the disc and power down the unit.

■ CONNECT / ACTIVATE APPLE TV

Your coach is equipped with an Apple TV module, which is located under the passenger side rear ottoman seat. Before attempting to activate your module, you need to establish an account and have an active internet connection.

An internet connection may be established through your coach's onboard WiFi Cradle device, or through any available WiFi connection (for example, using a mobile hot spot).

Depending on the year model of your coach, the Apple TV module and the Cradle Point IB600 router are located under the passenger side rear seat ottoman (2020 models), or inside a special compartment accessible through the hanging wardrobe locker on the driver's side of the coach (2021 and later models). **Follow these procedures to connect, activate, and playback Apple TV:**

STEP 1

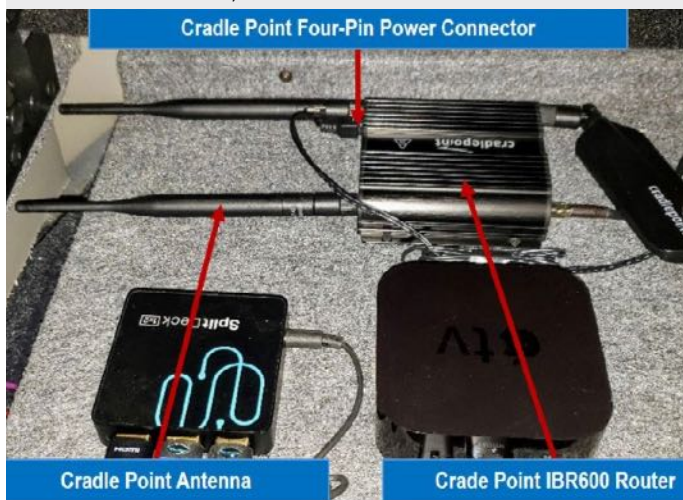
Turn on your TV and select the HDMI1 source (HDMI2 if your coach is equipped with the optional Blue Ray player);

STEP 2

Turn on the FUSION® Apollo™ RA-770 and select the corresponding HDMI1 or HDMI2 input to match your TV;

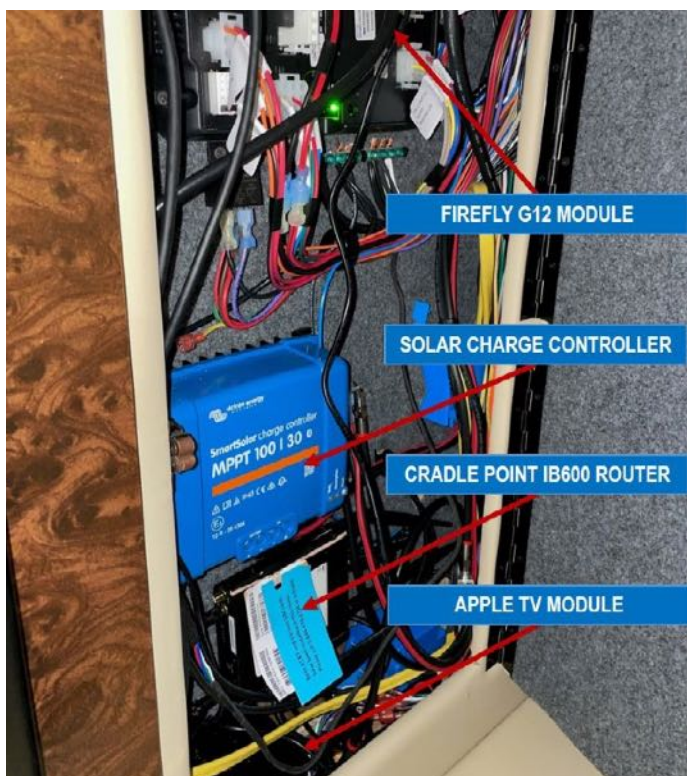
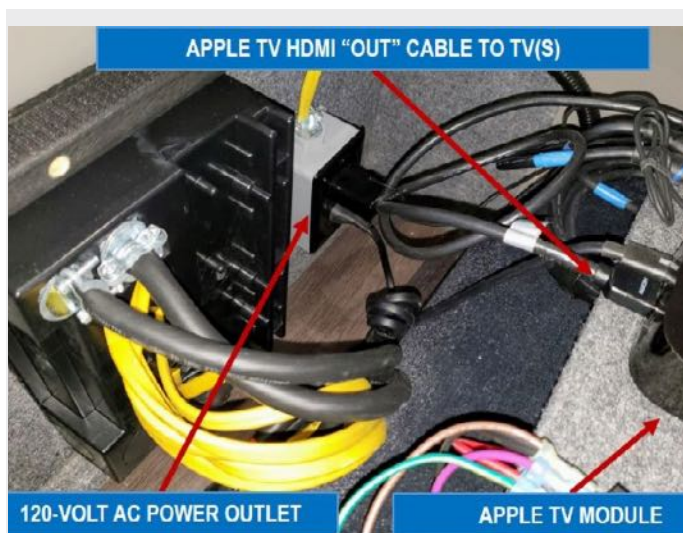
STEP 3a

Applies to 2020 year model coaches only. Lift the passenger side ottoman seat and locate the Apple TV module;



STEP 3b

Applies to 2021 and later year model coaches only. Open the door to the hanging wardrobe locker on the driver's side above the rear ottoman seat, and gently remove the interior AV compartment hatch. Pull the hatch open. It is a hinged cover and is held closed by a pair of retention clip;



Your Apple TV module is controlled by a dedicated remote control that accompanied your coach at the time of delivery. The remote has a swipe / touch surface at the top section of the remote control, with menu and function buttons located below the swipe area.

STEP 5

Swipe the touch surface on the Apple TV remote to find and select your language, country / region. To choose the appropriate selection tap the touch surface. If you make a mistake, press the "MENU" button to go back;

Follow the on-screen prompts to activate your Apple TV device. To activate your device you must have an active Apple ID.

STEP 6

If you do not already have an Apple ID you will need to create one. Visit: <https://support.apple.com/en-us/HT204316> to create an Apple ID using an iPhone, MAC, PC, or other mobile device;

STEP 7

Follow the on-screen steps to connect to the WiFi internet source and to sign in with your Apple ID;

STEP 4

Momentarily unplug the Apple TV power cord from the 120-Volt AC power outlet. Wait 10 seconds before plugging the power cord back in. Then check the TV display to see if the Apple TV setup screen is displayed. If it does not appear, check the TV and FUSION® Apollo™ RA-770 display to ensure you have selected the correct (and matching) HDMI input on both units. If it still does not appear, check the power connection to the Apple TV module and make sure the 120-Volt AC Shore Power cord is connected;



STEP 8 Follow the remaining prompts to set your Home Screen, and to add users to your Apple TV account;

STEP 9 Once complete the Apple TV Home Screen will appear and you can begin enjoying available programming; and,

STEP 10 You may also sign in with any additional internet based subscriber services that are available through your cable or internet service provider.



NOTE

You may need to power down and power up the Apple TV module in your coach the first time you activate it, or if it has been offline for a long period of time. Simply unplug the module's power cord and wait 10 seconds. Then plug the unit back in and look for the Home Screen to appear on your TV.

Remember, you must also have an Apple ID to activate the unit. If you do not already have one, you will need to establish an Apple ID.



WARNING

Apple TV is a subscriber-based service. Please use discretion when granting children access to the service to ensure content is monitored and appropriate for the audience / guests in your vehicle. Also use care to prevent the accidental or unwanted purchases of programming by children and / or guests in your coach.

■ CRADLEPOINT IBR600 IOT ROUTER

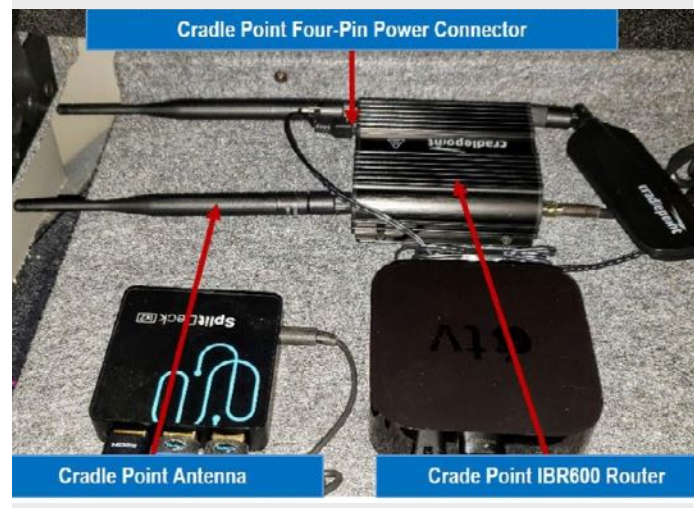
The American Coach Patriot is equipped with on board WiFi capability. Beneath the passenger side rear ottoman seat is a Cradlepoint IBR600 Series IoT router and NetCloud Manager. This unit provides industry-leading, LTE connectivity and Wi-Fi. These rugged mobile endpoints provide excellent internet connectivity for multiple end users within your coach, and they are backed by a limited lifetime warranty from the manufacturer (Cradlepoint). Please refer to the Cradelpoint Terms of Service and License Agreement.

Depending on the year model of your coach, the Apple TV module and the Cradle Point IB600 router are located under the passenger side rear seat ottoman (2020 models), or inside a special compartment accessible through the hanging wardrobe locker on the driver's side of the coach (2021 and later models).

To activate your Cradlepoint IBR600 Series IoT router, please follow these procedures:

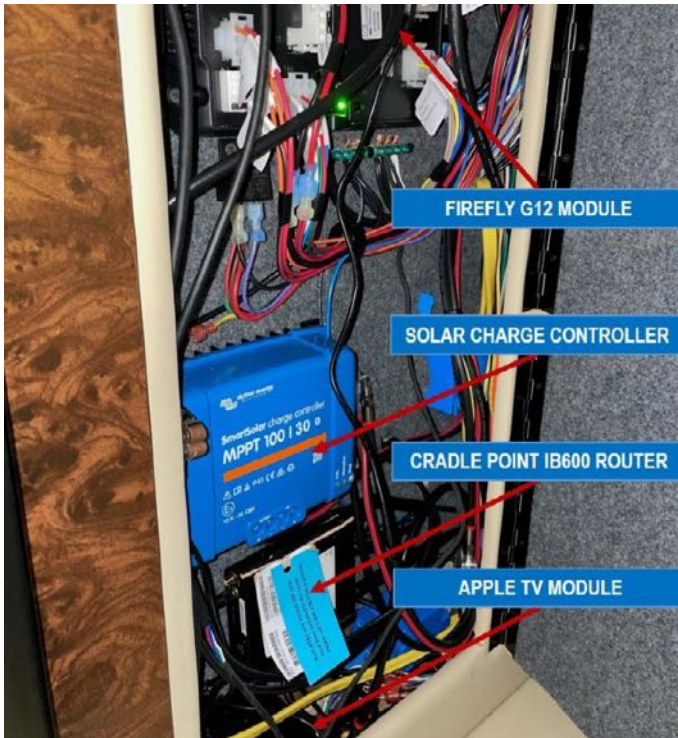
STEP 1a

Applies to 2020 year model coaches only. Lift the passenger side ottoman seat and locate the Apple TV module;



STEP 1b

Applies to 2021 and later year model coaches only. Open the door to the hanging wardrobe locker on the driver's side above the rear ottoman seat, and gently remove the interior AV compartment hatch. Pull the hatch open. It is a hinged cover and is held closed by a pair of retention clip;



STEP 2

The Cradlepoint router requires an active data subscription to a wireless broadband data plan to connect to a wireless network. SIMs with wireless broadband data plans are available from wireless carriers such as AT&T, Verizon, and T-Mobile. The SIM must be provisioned by the carrier before you attempt to operate the equipment. Contact your carrier for details about selecting a data plan and about the process for provisioning your SIM;

STEP 3

Unplug the four-pin power cable from the IB600 router. Wait 10 seconds;

STEP 4

Slide the SIM door open. Insert the SIM card notch end first with the metal contacts down into the SIM-1 slot. The SIM will click into place. Depress the SIM again to remove, if necessary. Slide the cover back into place and secure with the SIM cover screw (included);

STEP 5

Reconnect the four-pin power cord to the IB600 router;

STEP 6

Ensure the battery power button / switch is set to "On" at the main Firefly network interface display;

STEP 7

Make sure your coach is connected to 120-volt AC shore power, or the optional Onan LP Generator is on, and that the inverter in your coach is set to "On";

STEP 8

Access the WiFi network with any device by using the default password that was provided with your unit; and,

STEP 9

Close the AV compartment hatch.

Before using the Cradle Point IBR600 IoT router you must first install an active SIM card, provisioned by your mobile wireless service provider. Contact your service provider for data plan options and details before proceeding further.

Power the Cradlepoint IBR600 router down before installing the new SIM card to avoid potentially damaging the new SIM card.

Power the Cradlepoint IBR600 router down before installing the new SIM card to avoid potentially damaging the new SIM card.



WARNING

Upon activating your Cradle Point IBR600 Series router the device will be visible to other WiFi enabled devices within close proximity to your coach whenever the system is active. Therefore, you should always change the default password immediately after activating the unit. This is important to protect your network and data plan from unwanted access by others.



SECTION 12

Winterization and Storage



WINTERIZATION AND STORAGE

The American Coach Patriot is not a four-season vehicle as the plumbing system may not be used year-round in sub-freezing climates. Sub-freezing temperatures will damage your coach if you do not prepare the vehicle properly well in advance of expected cold weather.

Plan well ahead of inclement weather and prepare your American Coach Patriot's systems and equipment before cold temperatures arrive. This also includes preparation for long term storage of the coach. By following the procedures in this section, and best practices and guidance for winterizing recreational vehicles, your coach will remain in excellent condition.

Your American Coach Dealership can advise you concerning specific winterization requirements, procedures, and products for your geographical area, or the areas through which you will be traveling. They are also capable of winterizing the equipment, appliances, and systems in your American Coach for you. Schedule winterization services well in advance to avoid being caught unprepared when cold weather arrives.

Following these guidelines will enhance your luxury Class B coach ownership experience and will ensure many years of reliable and trouble-free operations.



NOTE

American Coach Dealerships are capable of winterizing the equipment, appliances and systems installed in your coach. Plan ahead for cold weather, to ensure your vehicle is winterized before sub-freezing temperatures arrive. Failure to winterize the coach will result in permanent and costly damage, which is not covered under warranty.



■ VEHICLE STORAGE

When storing your coach for any period of time exceeding 30 days, you should take precautions to: remove any perishable items such as food and drinking water; remove clothing, luggage, gear, and equipment; ensure the inside of the coach is cleaned and vacuumed thoroughly; drain and flush all plumbing lines; and, empty all holding tanks (fresh water / gray & waste water).

SHORT TERM STORAGE

During short periods of storage (Less than 30 Days), **follow these guidelines:**

- | | |
|----------------|---|
| STEP 1 | Wash the entire exterior of your coach (to include the roof) to remove all dirt, bugs, residue, mud, and road salt; |
| STEP 2 | Apply a good coat of wax per the guidelines in Section 5 – Exterior of this manual; |
| STEP 3 | Thoroughly clean the interior as noted above, paying particular attention to counter tops, shower, toilet, and carpets; |
| STEP 4 | Inflate all tires to their maximum rated cold pressure to prevent tire flat spots from occurring while the vehicle is sitting unused. |
| STEP 5 | Install tire covers to prevent UV damage and to protect the PVD finish on the wheels; |
| STEP 6 | Park your coach as level as possible; |
| STEP 7 | Block the front and rear wheels with rubber chocks. Place your transmission in park and apply the parking brake; |
| STEP 8 | Follow the battery storage and maintenance procedures found in this chapter; |
| STEP 9 | Thoroughly flush all plumbing drain lines and the gray and black waste holding tanks; |
| STEP 10 | Drain the entire freshwater system, including the freshwater tank. |
|
 | |
| STEP 11 | Ensure the water pump is turned "Off" on the main Firefly network interface display; |
| STEP 12 | Turn off the propane tank valve switch at the remote filling compartment at the passenger side rear of the vehicle; |

If sub-freezing temperatures are likely, install non-toxic polypropylene antifreeze following the winterization procedures that are prescribed later in this manual;

STEP 13 Ensure all appliances are off;

STEP 14 Open and secure the refrigerator door and place an open box of baking soda within the refrigerator to help absorb odors;

STEP 15 For open air circulation, open interior doors, drawers, and cabinets;

STEP 16 Cover the exterior water heater vent cap with duct tape prevent insect intrusion. You should also cover the end of the furnace exhaust pipe and the optional generator exhaust pipe. Leave a prominent note on the galley countertop as a reminder to remove the coverings before placing the coach back into routine service; and,

STEP 17 Install the front privacy shades. Then close all interior shades and blinds before locking the coach.



NOTE

If your coach will be in storage during periods of potential sub-freezing temperatures, winterize all systems following the procedures prescribed later in this chapter.

LONG TERM STORAGE

During extended periods of storage (Greater than 30 Days), complete all previously noted steps and these additional procedures:

STEP 1 Run the vehicle to normal operating temperature, and turn on the chassis air conditioner to lubricate the compressor seals;

STEP 2 Drain the engine oil (regardless of mileage), replace the oil filter, and refill with fresh oil according to the specifications listed in the Mercedes-Benz Sprinter Operating Instructions and Section 13 – Maintenance of this manual;

STEP 3 Remove the windshield wiper blades and store them in a cool and dry location out of the elements to prevent dry rot;

STEP 4 To prevent fuel deterioration due to oxidation add a diesel fuel stabilizer with algicide when storage will exceed 60 days. Operate the vehicle briefly prior to the storage period to mix the fuel stabilizer throughout the fuel system;

STEP 5 Change the oil on the optional Onan LP Generator (if equipped);

STEP 6 Drain the Diesel Exhaust Fluid (DEF) container and leave a reminder note at the driver's position to refill the tank prior to driving the vehicle following storage;

STEP 7 Inspect all roof sealant to ensure there are no cracks and apply new sealant if necessary;

STEP 8 Lubricate all locks and hinges;

STEP 9 Winterize all appliances, equipment and the plumbing system in accordance with the instructions later in the manual;

STEP 10 If the vehicle will not be connected to a constant 120-Volt AC shore power source, turn off the main battery switch at the Firefly network interface display and disconnect the negative power cable to the house battery bank; and,

STEP 11 Complete the chassis battery disconnect procedures in the Mercedes-Benz Sprinter Operating Instructions; and,

STEP 12 (Optional) Ensure the vehicle is completely clean and free of any dust or dirt prior to covering it with a fitted RV storage cover.



NOTE

The Mercedes-Benz maintenance schedule is oriented on vehicles in frequent regular / daily usage. Always change the engine oil and filter prior to storing your coach for a long period of time. This will inhibit potential damage to seals and the corrosion of internal engine components during storage. Change the oil immediately prior to storage regardless of accumulated miles since the last oil change.

■ WINTERIZING THE COACH

If your American Coach Patriot will be subject to sub-freezing temperatures it must be winterized. This is a complex procedure and we strongly recommend that you have your coach winterized by an authorized American Coach dealership. **The following procedures must be followed in precise order to ensure your coach is adequately protected from potential freeze damage:**

STEP 1 Park the coach on a level surface from side to side and front to rear;

STEP 2 Turn the water pump off, and disconnect the coach from any city water supply;

STEP 3

Step 3 - Open all the hot and cold-water faucets, to include the shower fixtures (both inside and outside showers);

STEP 4

Remove the drain plug from the fresh water tank and allow it to drain completely. The tank and drain plug are located on the driver's side just behind the front axle;



STEP 5

Set the water selector lever in the wet bay to "City";

STEP 6

Attach an air compressor line with the appropriate Schrader valve adapter to the fresh water inlet in the wet bay. Set the air compressor pressure regulator to no greater than 30 psi;

STEP 7

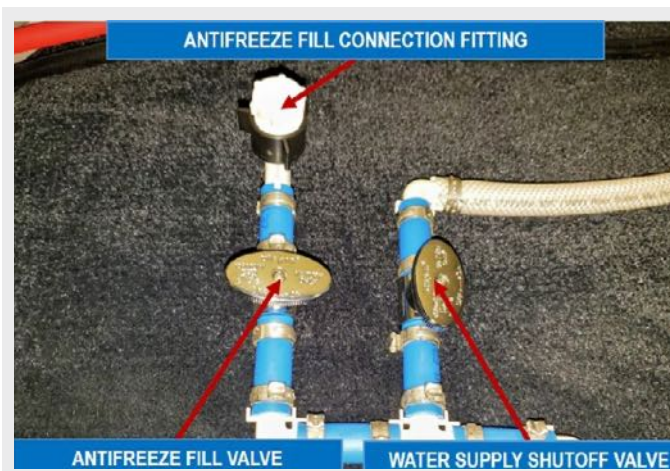
Use the compressed air to blow out the water lines to ensure all water has been purged from the hot and cold supply lines;

STEP 8

Remove the air line from the fresh water inlet and set the water source lever to "Tank";

STEP 9

Pump 5 gallons of **-50°F propylene glycol non-toxic RV antifreeze** into the fresh water tank. Alternatively the antifreeze may be pumped directly into the system at the water pump, using the winterizing valves. Connect the RV antifreeze source to the fill connection fitting. Close the water supply shutoff valve and open the antifreeze fill valve. Then pump the RV antifreeze into the system;



STEP 10

Close all faucets and shower fixtures. Then turn on the fresh water pump. Do not turn on the water pump if filling the system from the antifreeze fill connection fitting per Step 9 above;

STEP 11

Flush the toilet until pink RV antifreeze flows into the bowl. Allow at least one gallon of antifreeze to enter the tank;

STEP 12

Open each hot water faucet (one at a time) in the following sequence, allowing the water pump (or the alternate RV antifreeze supply via the onboard fill connection) to run until pink antifreeze flows steadily from each fixture: bathroom sink; bathroom shower head; galley sink; and, the outside shower.

STEP 13

Repeat Step 12 for each cold water faucet and the shower heads following the same sequence;

STEP 14

Turn off the water pump. If you are alternatively using the onboard RV antifreeze filling connection fitting, turn off the fill valve, remove the antifreeze supply, and reopen the water supply shutoff valve. Do not forget this important step, as water / antifreeze will flow back into the coach if the fill valve is not closed;

STEP 15

Take your coach to an RV pumpout station and empty both the gray and black tanks completely; and,

STEP 16

Pour ½ gallon of RV antifreeze down each sink drain, and the shower drain to ensure the drain lines and the holding tank dump valves are properly protected.



DANGER

Never use windshield washer fluid, ethanol, or conventional automotive coolant as antifreeze for your coach's fresh water system. Ethanol will damage the rubber "O" rings in your faucets and the diaphragm in your water pump. Windshield washer fluid and automotive coolant are highly toxic and using either in your plumbing system may lead to poisoning and / or death.



WARNING

Winterize all appliances, equipment, and the plumbing system if sub-freezing temperatures are possible during storage periods. Your coach should be winterized by a qualified technician at your American Coach dealership. Failure to winterize the coach may result in costly damage, which will not be covered under warranty if the coach was not properly winterized.



WARNING

Never exceed a compressor setting of 30 PSI when clearing the water lines. Higher pressures could damage the hot water heater and the freshwater pump. Always turn off the RV antifreeze fill valve and cap the fill connection when not in use to prevent water / antifreeze from flowing back into the coach.

For Freedom Lithium® equipped coaches, please follow the procedures in the Whale Installation and Operation Manual for winterizing the heater, to include draining the unit before proceeding with the installation of RV antifreeze in the fresh water system.

When placing the coach back into service following winterization, it is necessary to completely flush the non-toxic RV antifreeze from the entire fresh water system, to include the water pump, freshwater tank, and the water heater.

BATTERY WINTERIZATION

During extended storage, you should have an American Coach dealership remove and store the house battery(s) from your coach in a cool dry location. If this is not possible, then the battery(s) should be disconnected from service by removing the negative cable between the battery and the inverter. This is important for the longevity of your batteries, and the state of charge should be checked periodically while the battery(s) are in storage. A maintenance charge should be applied

as necessary to keep the battery(s) fully charged while in storage. If you do not place the coach into long term storage, and perhaps operate it during winter months, you must still maintain the house battery state of charge. This is especially important when the ambient outdoor temperature is expected to drop below freezing. If your coach is connected to 120-Volt AC shore power while it is parked, the inverter / charger will maintain the house battery state of charge. Keep in mind, however, that if your coach is equipped with the Freedom Lithium® LiFePO4 battery option, they will only charge when outside temperatures are above freezing.

CHASSIS BATTERY ISOLATION

Mercedes-Benz recommends disconnecting the current to all chassis electric consumers using the battery isolator switch if the vehicle will sit unused for periods longer than 2 months. **Please follow this procedure:**

STEP 1

Gain access to the battery isolator switch located to the right of the accelerator pedal in the driver's foot well;

STEP 2

Slide the red release down and pull it off the post; and,

STEP 3

Leave a prominent reminder note in the driver's compartment area to re-install the release before placing the coach back in service.

Disconnecting the chassis battery for long term storage is essential to protect sensitive chassis electronics. Please refer to the Mercedes-Benz Sprinter Operating Instructions for precautionary warnings and additional information.

■ DE-WINTERIZING PROCEDURES

To recommission your coach following long term or winter storage, follow these procedures:

STEP 1

Inspect the exterior, roof, engine compartment, and beneath the chassis of the vehicle for any possible damage, unwanted insect or bird nests or signs of small animal dwellings. Pay particular attention to wheel wells and vent openings;

STEP 2

Remove all previously installed temporary coverings of appliance, furnace, generator, and water heater vents;

STEP 3

Inspect the interior doors, drawers, vent openings, and beneath seating areas for signs of insects and animal intrusion / damage;

STEP 4 Perform an engine bay inspection. Look carefully for any signs of small animal nests, and pay close attention to wire harnesses for any chaffing or damage. Check all engine and chassis fluid levels. Refill the DEF fluid container;

STEP 5 Re-connect the chassis and house battery(s). Perform a battery test and recharge both banks as necessary.

STEP 6 Follow the System Settings directions in your Mercedes-Benz Sprinter Operating Instructions after the chassis battery is re-connected. You will need to reprogram the side windows and the power sliding door if you have removed all power from the chassis;

STEP 7 Adjust tire pressure to specifications;

STEP 8 Remove all window coverings;

STEP 9 Install wiper blades if they were temporarily removed;

STEP 10 Start the vehicle and monitor the instrument cluster for any warning indicators. Allow engine to reach its normal operating temperature. Shut the engine down and recheck all fluid levels. Add fluids as necessary;



STEP 11 Plug the coach into a 120-Volt AC 30 amp shore power source;

STEP 12 Allow the inverter / charger to charge the house batteries for at least one full hour before turning on the power button / switch to the main Firefly network interface display;

STEP 13 Turn on the power button / switch at the main Firefly network interface display and observe the battery state of charge for both the house and chassis batteries. Both battery banks may take several hours to reach their full state of charge and capacity;

STEP 14 Perform an operational check of all exterior and interior chassis lights, the chassis and roof air conditioners, all windows and hatches, and the windshield wiper / washer;

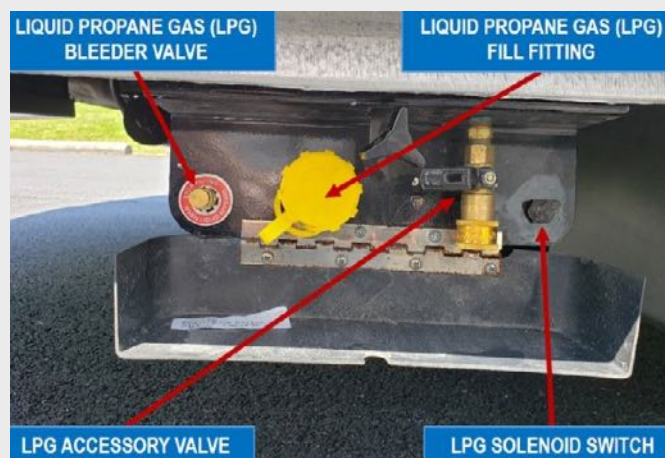
STEP 15 Perform a function check of all appliances (refrigerator, water heater, power folding rear bench seat, roof fans, inverter, WiFi network, and the infotainment system);

STEP 16 Perform a complete safety check of all smoke and CO detectors / alarms and replace the device batteries if necessary in accordance with the instructions prescribed in SECTION 4 – SAFETY of this manual.

STEP 17 For Suburban IW60 propane water heater equipped coaches, turn on the water pump and allow water to flow through the hot water side of the faucet until the propane hot water heater generates hot water;

STEP 18 For Whale electric water heater equipped coaches, allow water to flow through the hot water side of the faucet until the hot water heater generates hot water. If it does not produce hot water, check to ensure the water heater has been turned on;

STEP 19 Open the remote fill compartment at the passenger side rear of the coach, and turn the LP safety solenoid switch off to allow propane to feed the generator and water heater. Check the system for leaks before operating equipment;



STEP 20 Place the Optional Onan LP generator back into service. Open the service hatch first to inspect inside the generator housing for any signs of nests or small animal intrusion. Remove any covering over the exhaust outlet. Check the oil level. Then start the generator, bring it up to operating temperature, and load test the unit;

STEP 21 Lubricate all exterior locks, hinges, and door latches following the instructions in the Mercedes-Benz Sprinter Operating Instructions;

STEP 22 Perform an operational drive check of the coach. Cycle the brakes, power steering, and initially drive slowly to allow for the circulation of fluids to all vital components. Gradually bring the coach up to speed and listen carefully for any unusual sounds. Check the instrument cluster for any warning indicators.

STEP 23 Drive the vehicle at highway speeds until the 3.0 turbo diesel has completed an exhaust cleaning cycle. Then schedule a service appointment with a Mercedes-Benz Sprinter dealership to inspect the coach for any necessary adjustments or to correct any possible chassis malfunctions.

STEP 24 If the Diesel Exhaust Fluid (DEF) tank was drained for storage, you will need to refill the tank. Open the hood and remove the blue "DEF" cap, located on the passenger side of the radiator mount at the very front of the engine compartment. Using a funnel, gradually refill the tank, being careful not to spill the fluid. Then start the coach and check both the DEF fluid level and the exhaust filter status at the instrument cluster.



WARNING Remove all temporary storage / winter coverings of vents, exhausts and openings prior to operating the coach and any appliances. Failure to remove temporary coverings could result in a fire and / or damage to the coach and its appliances.



WARNING

Never operate the 3.0 turbo diesel engine without an adequate level of Diesel Exhaust Fluid (DEF). If the DEF tank was drained for long-term storage it must be refilled before operating the coach. Failure to maintain the DEF level will damage the coach's exhaust system catalytic converter and the Diesel Particulate Filter (DPF).

If the chassis battery was disconnected for long term storage, the power windows and power sliding side door must be reactivated following the procedures in the Mercedes-Benz Sprinter Operating Instructions.

■ RECOMMISSION THE PLUMBING SYSTEM

Before using the plumbing system after long term or winter storage you must first drain any antifreeze from all plumbing lines and the freshwater tank, and sanitize the freshwater system. **To recommission your coach's plumbing system, please follow this process:**

STEP 1

Lift open the driver's side rear ottoman seat and check the winterizing valves adjacent to the water pump to ensure the antifreeze fill valve is closed and the water supply valve is open. Then open all faucets and shower sprayers. Don't forget the outside shower head in the wet bay compartment;

STEP 2

Allow the propylene glycol antifreeze to drain from all water lines. You may use an air compressor to aid in purging the water lines, using care not to exceed a 30 psi setting. Then close all faucets and the shower head sprayers;

STEP 3

Drain any remaining propylene glycol antifreeze from the freshwater tank by temporarily removing the drain plug;

STEP 4

Add fresh water to the freshwater tank and turn on the freshwater pump;

STEP 5

Flush the toilet until clear water flows into the bowl;

STEP 6

Open each hot water faucet (one at a time) in the following sequence, allowing the water pump to run until clear water flows steadily from each fixture: bathroom sink; bathroom shower head; galley sink; and, the outside shower fixture;

STEP 7

Open cold hot water faucet (one at a time) in the following sequence, allowing the water pump to run until clear water flows steadily from each fixture: bathroom sink; bathroom shower head; galley sink; and, the outside shower fixture;

STEP 8

Turn off the water pump;

STEP 9

Connect to a city water supply and repeat the hot and cold water line flushing process (Steps 6 and 7) to ensure no residual antifreeze remains in the system. Re-check each fixture for water clarity;

STEP 10

Follow the procedures to sanitize the water tank and supply lines in SECTION 8 – PLUMBING after you have completely purged all antifreeze from the plumbing system; and,

STEP 11

Empty the gray and black water holding tanks at the first opportunity after de-winterizing the entire coach.

**WARNING**

Before de-winterizing the freshwater system, make sure the RV antifreeze fill fitting and valve are in the closed position, and the water supply valve is in the open position. Failure to ensure the valves are in the proper position could allow water to suddenly enter the coach under pressure, causing damage to the vehicle.

After recommissioning the freshwater system, inspect all fixtures for potential leaks and proper operation with the water pump turned on. Repair any leaks before using the coach to avoid water damage to the interior.

**DANGER**

Remove all residual non-toxic propylene glycol RV antifreeze, flush the water tank and lines, and sanitize the freshwater system before using the coach. Failure to sanitize the entire freshwater system prior to use may result in serious physical illness and / or death.



SECTION 13

Maintenance



MAINTENANCE

■ MAINTENANCE SCHEDULE AND RECOMMENDED REQUIREMENTS

Your American Coach Patriot is a finely crafted luxury coach that will benefit greatly from a routine schedule of maintenance and services. Please read this section carefully, in addition to the Mercedes-Benz Sprinter Operating Instructions, to ensure you complete the recommended or required services and maintenance on a regular basis. This will enhance your ownership experience and ensure many years and miles of reliable and trouble free operations.

We have shortened the time period and mileage interval between some of the recommended scheduled services, versus what is recommended in the Mercedes-Benz Sprinter Operating Instructions. This is the result of factoring in the designed purpose and anticipated usage of your coach, which justifies a more frequent service or maintenance interval.

For engine and chassis related maintenance and care requirements, please refer to the Maintenance and Care section of the Mercedes-Benz Sprinter Operating Instructions. The ASSYST PLUS service interval display on your coach's instrument display provides information on the remaining time or distance before the next service due date.

We recommend that you establish a relationship with a convenient Mercedes-Benz dealership that is authorized to sell and service Sprinter vans. This will ensure your coach's chassis is properly maintained and that all manufacturer service campaigns, recalls, and warranty repairs or adjustments are taken care of promptly and correctly by an MBUSA factory certified Mercedes-Benz Systems Technician.

The initial Mercedes-Benz Service A Interval is recommended at 10K miles. The Mercedes-Benz Service B Interval includes all Service A Interval items in addition to other items. The prescribed service interval is based on normal vehicle use. Maintenance work will need to be performed more often than prescribed if the vehicle is operated under arduous conditions or increased loads.

Service work which is not carried out at the right time or incompletely can lead to increased wear and damage to the vehicle. Failure to complete required services in a timely manner may lead to the denial of warranty repair coverage.

■ SEVERE SERVICE / TOWING

Special precautions must be taken before attempting to tow your coach. Please refer to SECTION 4 (SAFETY) before proceeding further. Without the engine running, there is no power assistance for the vehicle's braking and steering systems. In this case, it is important to keep in mind that a considerably higher degree of effort is required to brake and steer the vehicle. The drive wheels must also be unlocked before attempting to tow the vehicle. See the Mercedes-Benz Sprinter Operating Instructions before attempting to tow the coach.

Because of the special features installed on your coach, along with its size, weight, and special exterior accessories, we recommend that you consider subscribing to one of several commercially available RV towing services. The average towing service may be unable to properly tow your coach without damaging it.



WARNING

Considerable damage may occur if the touring coach is improperly lifted for towing purposes. Only qualified professional RV towing service companies with proper equipment should be used. Costly damage to exterior accessories may result if the coach is improperly lifted or towed. Please observe all cautions and warnings in the Mercedes-Benz Sprinter Operating Instructions before towing your touring coach.



WARNING

Do not tow the vehicle if the ignition is locked. The vehicle cannot be steered when the steering column is locked. The coach must also be taken out of "P" (Park) mode before towing, otherwise considerable damage to the vehicle may occur.

■ ONAN QG 2500 LP GENERATOR

GENERAL INSPECTION

Perform a general inspection of the optional generator set after every eight hours of operations. Perform an operational check of the set and look for any visual defects or audible irregularities that may be of concern.

EXHAUST SYSTEM

Inspect the exhaust system and look for any exhaust leaks from matching surfaces or holes in the ducting. If the generator is running louder than normal this could be an indication of a possible exhaust

leak. Read SECTION 4 (SAFETY) carefully before operating the optional Onan LP Generator. Always replace any worn, damaged, or corroded exhaust components before a leak can occur.

**DANGER**

If there are any exhaust leaks, do not operate the generator set. The inhalation of exhaust fumes and Carbon Monoxide (CO) gas could cause severe personal injury or death. Have the generator and the exhaust system repaired prior to operation.

FUEL SYSTEM

With the generator set running, be sure to inspect the fuel plumbing and filter for leaks. Check all flexible gas line sections for cuts, cracks, and abrasions. Make sure flexible sections and plumbing do not rub against any surfaces that could chafe or damage the component. Replace worn or hardened fuel line components before a leak can occur. The propane tank and lines operate under pressure and any leak should be considered a serious maintenance issue for immediate resolution.

**DANGER**

If any leaks are detected, be sure to have them repaired promptly before operating the generator. Fuel presents the hazard of fire or explosion that could result in serious physical injuries or death.

**DANGER**

Before performing any maintenance to the 120-volt or the 12-volt electrical systems disconnect the generator starting battery cables. Accidental starting of the generator set during maintenance can cause an electric shock, resulting in severe personal injury or death.

■ Lubrication System

Before operating the optional Onan generator, the engine must be filled with oil as recommended by the specification section for the lubricating oil capacity found in the ONAN QG 2500 Generator Manual.

The engine crankcase should be filled with oil to the FULL mark on the oil level indicator. Do not mix grades or brands of oil and refer to the recommended Engine Oil in the ONAN QG 2500 Generator Manual. The generator requires one (1) US Quart of 15W-40 oil designed to meet American Petroleum Institute (API) specification SG.

Slowly add oil until it reaches at or just below the FULL mark on the oil level indicator. Do not over fill the oil as this will cause foaming of the oil in the crankcase, which will eventually foul the air filter cartridge and may cause damage to the generator. Install the oil level indicator tightly to avoid leakage.

■ Checking Generator Engine Oil Level

Check your generator oil level regularly, at least once each week when it is in regular use, or sooner under severe operating conditions (high ambient temperatures and dusty conditions). Your generator is air cooled, therefore maintaining the oil level is absolutely essential.

STEP 1

Open the service hatch on the generator and remove the oil level dipstick indicator. Wipe it with a clean lint-free dry rag;

STEP 2

Place the oil level dipstick indicator into the oil fill. Do not screw the dipstick indicator down;

STEP 3

Remove the oil level dipstick indicator again and check the oil level on the indicator stem;

STEP 4

Add oil slowly repeating steps 2 and 3 until the oil is at or just below the FULL mark on the oil level dipstick indicator. If you have overfilled the level, remove the oil drain plug to reduce the level.

**DANGER**

Never check the oil level while the generator set is running. Hot oil could blow out of the oil fill tube and can cause serious burns or physical injuries.

SYSTEM	MERCEDES-BENZ SPRINTER	AMERICAN COACH	SEVERE DRIVING CONDITIONS
Engine Oil and Filter Replacement – Service A Interval	Every 20K Miles / ASSYST PLUS Time or Distance	Every 10K Miles / ASSYST PLUS Time or Distance	Every 5K Miles / ASSYST PLUS Time or Distance
Ad-Blue (DEF) System Service – Service A Interval	Every 20K Miles / ASSYST PLUS Time or Distance	Every 20K Miles / ASSYST PLUS Time or Distance	Every 5K Miles / ASSYST PLUS Time or Distance
Adjust all Fluid Levels – Service A Interval	Every 20K Miles	Prior To Trip	Every 5K Miles / ASSYST PLUS Time or Distance
Battery Test – Service A Interval	Every 20K Miles	Every 20K Miles or Annually	Every 20K Miles or Annually
Tire Rotation – Service A Interval	Every 20K Mile	Every 7.5K Miles	Every 7.5K Miles
Tire Inflation Check – Service A Interval	Every 20K Mile	Daily & Prior To Trip	Daily & Prior to Trip
Check Torque of Rear Axle U-Bolts – Service A Interval	Every 20K Mile	Every 20K Miles	Every 10K Miles
Multi-Point Inspection – Service A Interval	Every 20K Mile	Every 10K Miles	Every 10K Miles
Lubricate Doors and Hinges - Service A Interval	Every 20K Mile	Every 20K Miles	Every 10K Miles
Cabin Filter Replacement – Service B Interval	Every 40K Mile	Every 12K Miles or Annually	Every 12K Miles or Annually. Sooner in high dust conditions
Brake Fluid Flush – Service B Interval	Every 40K Miles	Every 40K Miles	Every 20K Miles
Transmission Service	Every 60K Miles	Every 40K Miles	Every 20K Miles
Air Filter Replacement	Every 60K Miles	Every 12K Miles or Annually, whichever occurs first	Every 12K Miles or Annually. Sooner in high dust conditions
Engine Oil and Filter Replacement – Service A Interval	Every 20K Miles / ASSYST PLUS Time or Distance	Every 10K Miles / ASSYST PLUS Time or Distance	Every 5K Miles / ASSYST PLUS Time or Distance
Ad-Blue (DEF) System Service – Service A Interval	Every 20K Miles / ASSYST PLUS Time or Distance	Every 20K Miles / ASSYST PLUS Time or Distance	Every 5K Miles / ASSYST PLUS Time or Distance

LPG 2.5 KV PERIODIC MAINTENANCE SCHEDULE

SERVICE ITEMS AND MAINTENANCE	SERVICE TIME
Inspect Generator Set – Check for oil, Fuel, and exhaust system leaks. Check exhaust system audibly and visually	Daily or After 8 Hours
Check Oil Level	Daily or After 8 Hours
Change Crankcase Oil – Perform after first 20 hours of operation on new sets	Monthly or After 100 Hours
Check Battery Specific Gravity	Monthly or After 100 Hours
Clean and Adjust Governor Linkage – Have the Onan Service Center Perform	Monthly or After 100 Hours
Replace Air Filter – Perform more often in extremely dusty conditions	After 150 Hours
Clean Spark Plug – Replace annually or prior to storage	After 200 Hours
Clean Cooling Fins – Have the Onan Service Center Perform	After 200 Hours
Check Valve Lash Clearance – Have the Onan Service Center Perform	After 200 Hours
Clean and Adjust Carburetor – Have the Onan Service Center Perform	After 500 Hours
Clean Cylinder Head – Have the Onan Service Center Perform	After 500 Hours
Inspect and Pressure Test the LPG System – Perform more frequently if there are extended periods of nonuse	After 500 Hours

■ Changing Generator Engine Oil

To change the generator oil, you will need the following tools: a flat blade screwdriver to open the service hatch; a 3/8" drive ratchet wrench; a short 3/8" drive socket extension; a 3/8" drive 9/16" socket; shallow oil drain pan; and, an oil pump or funnel with long neck to add oil to the crankcase. **Follow these procedures to change the oil on your Onan QG 2500 LP Generator:**

STEP 1 Run the engine until warm and then shut it off.

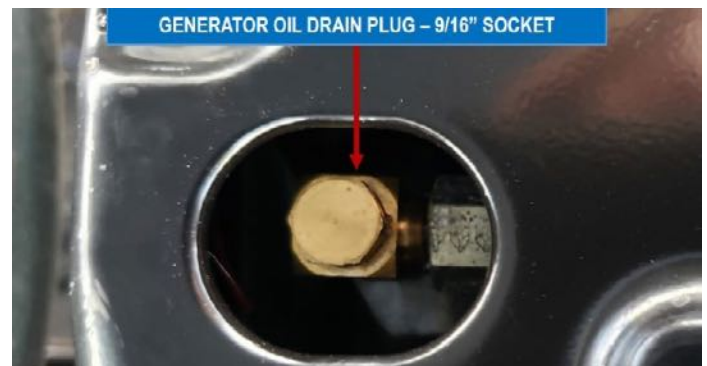
STEP 2

Remove the generator service hatch. To remove the hatch use a flat blade screwdriver or coin and rotate the latch ¼ turn counter clockwise. Carefully pull the latch off and set it aside.



STEP 3

Locate the oil drain plug, which is accessible through an oval hole located in the forward center area of the steel bottom shield on the generator. It is a small brass 9/16" threaded plug. Place a shallow oil drain pan beneath the generator and directly under the drain plug. You may want to place cardboard or an absorbent mat beneath the drain pan as well.



STEP 4

Using the 3/8" drive ratchet wrench with the short extension and a 9/16" socket, remove the drain plug by turning it counterclockwise. Set the drain plug aside after cleaning it with a dry rag and allow the oil to drain from the engine. Removing the dipstick indicator from the oil fill will aid in faster and more complete draining of the oil;



STEP 5

Allow the oil to drain completely. It is important to ensure the vehicle is on a flat level surface when draining the oil to ensure its complete removal. The oil pan should catch approximately 1 quart of used oil; LP gas powered generators may not darken the oil as much as a gasoline or diesel powered engine. This is due to lower density of carbon and deposits produced in the burning process and fewer impurities typically contained within LP gas versus gasoline or diesel fuel. Therefore, the oil will usually appear cleaner than expected during its removal. Do not assume the old oil is good, because it looks clean. The oil's viscosity still breaks down under extreme operating temperatures and must be changed regularly.

STEP 6

Carefully re-install the oil drain plug and tighten it securely to avoid a leak. Do not over tighten the plug as this may strip the threads on the plug or the crankcase. Wipe the area around the plug with a clean dry rag to remove any oil residue; and,

STEP 7

Following the Recommended Engine Oil and Specifications (Capacity) Section of the ONAN QG 2500 Generator Manual, replace up to 1 quart of oil in the generator through the oil dipstick indicator fill.

To do this, remove the oil level dipstick indicator and replenish the oil through the oil fill port using a hand pump or long neck funnel. Add the oil slowly and be sure not to over fill the level.



WARNING

Wear proper personal protective equipment (rubber gloves and face shield) when changing the generator's oil. Hot oil can cause severe burns if spilled or splashed on exposed skin.



NOTE

Only use oil that meets American Petroleum Institute (API) designation SG. Oil should be labeled as having passed MS Sequence Tests (also known as ASTM-G1V Sequence Tests). Oil grade 15W-40 is recommended. Refer to the Onan QG 2500 Generator Manual for recommended service intervals and additional information.

■ Air Filter

Replace the air filter every 150 hours as recommended on the Periodic Maintenance Schedule, or more often in extremely dusty environments. Use ONAN approved filters only.

STEP 1 Remove the generator service hatch cover;

STEP 2 Depress the two tabs and push them to the right simultaneously to unseat the air filter cover. Then pull the cover towards you;

STEP 3 Gently remove the air filter by pressing the blue / green rubber seal to the right, which will unseat it from the filter housing. Pull it towards you to remove the old filter;

STEP 4 Inspect the carburetor to make sure it is clean. If it is coated with oil and dirt, use a carburetor cleaner spray to remove any oil and dirt residue;

STEP 5 Install a new ONAN approved filter by gently sliding it fully into the housing and to the left; and,

STEP 6 Install filter cover by gently pushing the cover inwards to engage the inner mounting tabs and then pushing the cover to the left to latch the two locking tabs that you first pressed to remove the cover.

■ Battery Care

Your generator starts using the house battery bank. **To ensure your house batteries are performing efficiently, perform these preventive maintenance actions and inspections:**

STEP 1 Remove the generator service hatch cover;

STEP 2 Depress the two tabs and push them to the right simultaneously to unseat the air filter cover. Then pull the cover towards you;

STEP 3

Gently remove the air filter by pressing the blue / green rubber seal to the right, which will unseat it from the filter housing. Pull it towards you to remove the old filter;

STEP 4

Inspect the carburetor to make sure it is clean. If it is coated with oil and dirt, use a carburetor cleaner spray to remove any oil and dirt residue;

If the batteries will be removed, this should be accomplished by a qualified technician. We do not recommend battery removal by the owner / operator as the batteries installed in the coach are very heavy and require special handling for their safe and proper removal and re-installation.



DANGER

Do not smoke or allow any fire, flame, spark, or other ignition sources around the battery area. Do not disconnect battery cables while the generator set is cranking or running. Batteries gasses are explosive, which can result in severe burns and physical injuries or death.



WARNING

When working with batteries wear the proper personal protection equipment (rubber gloves, goggles, and a protective apron). The battery electrolyte solution if spilled / splattered can cause severe eye damage and burns to the skin.

■ Spark Plug

Replace the generator's spark plug after 200 hours or prior to storage as specified in the Onan QG 2500 LP Generator Manual's Periodic Maintenance Schedule. Once the spark plug is removed be sure to inspect it for wear. Verify the spark plug gap (0.0250 in. (0.64 mm)) and adjust if necessary, prior to re-installation. **Note the following:**

1. Black deposits indicate a rich mixture.
2. Wet spark plugs indicate misfiring and possible oil fouling.
3. Badly or frequently fouled spark plugs indicate the need for a major tune-up.

■ Carburetor Governor Linkage

Inspect and ensure the carburetor governor linkage is free to move through its entire range of travel. The governor linkage should be cleaned and adjusted by an ONAN Service Center as specified in the Periodic Maintenance Schedule (monthly or after 100 hours).

GENERATOR SET STORAGE

When the generator set is not in use greater than 120 days, the generator performance may degrade and effect the life of the engine.

The following procedure is recommended to keep the generator set running efficiently after periods of storage:

STEP 1

Disconnect the load, switch the generator's AC breaker off and stop the generator;

STEP 2

Close the fuel supply valve and remove the air filter. Restart the generator set at the set control. As the generator set starts to run out of fuel (noticeable stumble or surge), spray a storage fogger, such as OnaGard™, into the carburetor intake and then replace the air filter. Follow the manufacturer's instructions for using the fogger. (See air filter procedure above for filter removal and replacement);

STEP 3

Replace the air filter after the engine stops. Remove the spark plug and ground the spark plug lead to prevent arcing. Spray OnaGard™ or engine oil into the spark plug hole while cranking the engine for 3 seconds. Wipe away any excess oil and re-install the spark plug and the spark plug wire. (See spark plug procedure); and,

STEP 4

Drain the crankcase oil when the exhaust system has cooled following the procedures above. Refill the crankcase with clean oil.

RETURNING THE GENERATOR SET TO OPERATION

Follow these steps to place the generator back into service following long term storage:

STEP 1

Inspect and clean the generator set;

STEP 2

Check the engine oil and viscosity to ensure it is correct for the existing environment and temperature. Replace the oil if necessary;

STEP 3

Inspect and clean the battery terminals and connectors if necessary;

STEP 4

Inspect the air filter for cleanliness and replace if necessary;

STEP 5

Turn on the fuel supply;

Start the generator set at the set control. Initial startup may be slow, due to oil in the cylinder. Do not overheat the starter motor (see the generator starter damage warning under the LP Generator instructions in Section 9 (ELECTRICAL). Smoke and rough operation will occur until any storage oil in the cylinder is burned off. If the engine does not start, or continues to run roughly after starting, clean or replace the spark plug;

STEP 6

STEP 7

Apply 50 a percent load to the generator set until it runs smoothly. Run the generator for about one hour to allow it to reach operating temperature and to burn off any remaining storage oil residue; and,

STEP 8

Remove the load and allow the generator set run for three to five minutes to cool down. Then move the Start / Stop switch to the STOP Position. The generator set is now ready for operation.

If the generator has been in storage for more than a year, you may want to change the oil after this procedure. Oil can lose its viscosity and protective properties over long periods of storage.

The following lists the Onan QG 2500 LP Generator's specifications. This is an excerpt taken from the Generator Manual. Please refer to this maintenance schedule to keep your generator operating properly.

LPG 2.5 KV SPECIFICATIONS

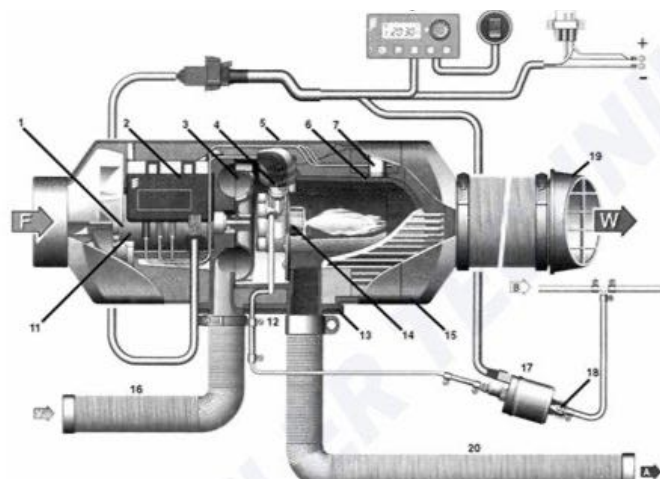
SYSTEM	SPECIFICATION
Generator Details	LPG 2.5 KV
Type	Onan, Revolving Field, 2-Pole
Frequency (Hertz)	60 Hz
Power (Watts)	2500W
Voltage	120V
Current (Amperes)	20.8A
Engine Details	
Engine	Onan GH-200
Fuel	LPG Vapor (11 inches W.C)
Engine Oil Capacity	1 qt (0.95 L)
Spark Plug Gap	0.025 in. (0.64 mm)
Battery Requirements	
Battery Size	12 Volt
Cold Cranking Amps	360 CCA

AVERAGE FUEL CONSUMPTION

No Load	0.2 gph (0.8 L/h)
Half Load	0.34 gph (1.29 L/h)
Full Load	0.55 gph (2.08 L/h)

ESPAR AIRTRONIC (MODEL D2) DIESEL FURNACE

The AIRTRONIC D2 is a compact diesel-fired 7,500 BTU/hr air heater, quality engineered to provide a dependable means of space heating. The unit is located in the left rear of the coach beneath the rear power-folding bench seat. Below is a schematic extract from the AIRTRONIX D2 / D4 / D4+ Operating Instructions and Service Book of the typical furnace. The controls in this illustration are for representative purposes only and may not precisely match what is installed in your coach. Depending on the model you own and its installed options, your coach's heater is either controlled by a separate thermostatic control unit, or it is controlled from the Firefly integrated network display.



1	Intake-air impeller	14	Combustion chamber
2	Control unit	15	Outlet hood
3	Combustion air impeller	16	Combustion air hose
4	Glow pin	17	Fuel metering pump
5	Cover	18	Filter built into the fuel pump
6	Heat exchanger	19	Hot air outlet
7	Combi flame / overheating sensor	20	Flexible exhaust tube
8	Module clock		
9	Change-over switch heating / ventilation optional	F	Fresh air
10	Fuse carrier with main fuse and switch fuse	W	Hot air
11	Electric motor	A	Exhaust gas
12	Fuel connection	V	Fuel
13	Flange seal	B	Combustion air

To maintain heating efficiency, ESPAR recommends these periodic maintenance steps, which should be performed by a qualified technician. We do not recommend these steps be completed by the owner / operator.

Have the technician refer to the AIRTRONIC D2 / D4 / D4+ Operating Instructions and Service Book. **The technician should follow these procedures to ensure reliable performance:**

- STEP 1** Remove the glow pin and inspect for carbon build up. Clean or replace as necessary. (See glow pin and screen inspection);
- STEP 2** Remove the glow pin screen and inspect for carbon build up. If build up is excessive, replace screen. (See glow pin and screen inspection);
- STEP 3** Make sure vent hole is open. ESPAR recommends the use of non-detergent 100% volatile carburetor cleaner sprayed with an air gun to help remove loose carbon from the glow pin chamber. (See glow pin and screen inspection);
- STEP 4** Inspect the ducting, the air intake screen and air outlet for restriction or blockage. Clean and clear contamination as necessary;
- STEP 5** Inspect combustion air intake and exhaust for blockage. Clean and remove any contamination as necessary;
- STEP 6** Operate the heater for a minimum of 20 minutes each month; and,
- STEP 7** Maintain your batteries and all electrical connections in good condition. With insufficient power the heater will not start. Low and high voltage cutouts will shut the heater down automatically.

GLOW PIN AND SCREEN INSPECTION

These procedures should only be performed by a qualified technician. We do not recommend these steps be completed by the owner / operator.

To gain access to inspect / replace the glow pin, glow pin screen, and the vent hole, **have the service technician follow these procedures:**

- STEP 1** Remove the AIRTRONIC cover by unlocking both seal plates. Then lift the cover and pull it away from the housing;
- STEP 2** Remove the control unit by unscrewing the fastening screw and pressing the control unit retaining brackets together;
- STEP 3** Lift the control up and out;
- STEP 4** Unclip the lines from the holder of the control unit (Label the positions of the lines);
- STEP 5** Remove the bushing from the outer case assembly;
- STEP 6** Disconnect the control unit from the controller;
- STEP 7** Disconnect the connector of the glow pin harness from the control unit;
- STEP 8** Remove the rubber grommet and use the special tool (SW 12) to unscrew the glow plug (the special tool is included with the glow pin);
- STEP 9** When the glow pin has been removed, check the screen of the support in its installed state for any contamination. The screen must be replaced if the surface is covered with carbon;
- STEP 10** Pull the screen out of the support with pointed pliers. Blow out the support with compressed air;
- STEP 11** Use the special tool (included with the new screen) to install the new screen. Push the screen onto the tool, while watching the position of the recess. The recess must be positioned at right angles (90°) to the axis of the heater;
- STEP 12** Push the tool with the screen carefully as far as it will go, ensuring that the bore for the glow plug ventilation is free;
- STEP 13** Install the glow pin using special tool (SW 12) and torque it to 53.1in-lbs (6 Nm);
- STEP 14** Reconnect the connector of the glow pin cable harness to the control unit;
- STEP 15** Install rubber grommet into the base;

- STEP 16** Install control unit through retaining bracket and tighten the fastening screw;
- STEP 17** Install cover onto the base and secure into seal plates; and,
- STEP 18** Perform an operations check of the heater to ensure it meets specifications.



WARNING

A qualified technician must perform all diesel furnace maintenance and service procedures. Improper servicing could lead to Carbon Monoxide (CO) poisoning and / or a fire, resulting in serious injuries and / or death.



DANGER

Ensure the furnace's diesel fuel system is intact and there are no leaks. Failure to follow these instructions could cause a fire resulting in damage to the vehicle, serious burns, physical injuries and / or death.



DANGER

Ensure an airtight seal will be maintained between the heater and mounting surface and at the intake and exhaust connection points. Failure to follow these instructions could cause oxygen depletion and / or Carbon Monoxide (CO) gas to enter the coach, resulting in serious injuries and / or death.

Your diesel furnace draws from the same diesel fuel supply as the 3.0 turbo diesel engine in your coach. Always check the fuel level to ensure you will have sufficient fuel to meet heating needs and to return from any remote camping sites.

The following table lists the AIRTRONIC D2 / D4 / D4+ heater specifications. This is an excerpt taken directly from the Operating Instructions. Please refer to this information to keep your furnace operating properly.

TECHNICAL DATA

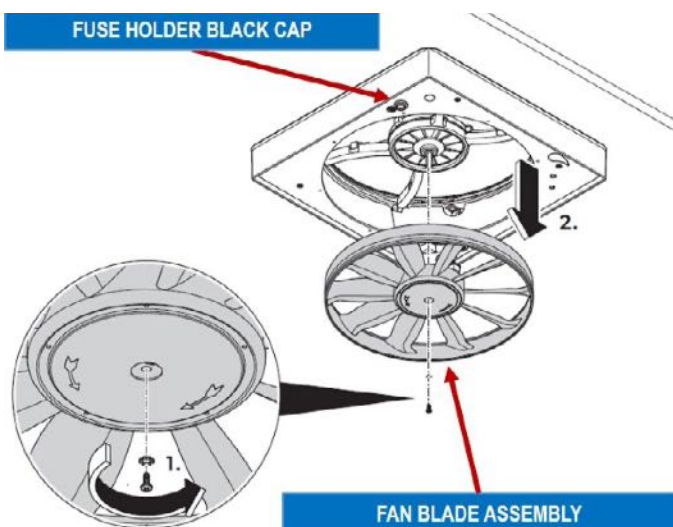
HEATER	AIRTRONIC
Version	D2
Heat Output ($\pm 10\%$)	7,500 BTU/hr Boost (2.2 kW) 6,150 BTU/hr High (1.8 kW) 4,100 BTU/hr Medium (1.2 kW) 2,900 BTU/hr Low (0.85 kW)
Current at 12v ($\pm 10\%$)	8.3 amps - Start 2.8 amps - Boost 1.9 amps - High 1.0 amps - Medium 0.7 amps - Low
Current at 24v ($\pm 10\%$)	4.2 amps/hr - Start 1.4 amps/hr - Boost 1.0 amps/hr - High 0.5 amps/hr - Medium 0.3 amps/hr - Low
Fuel Consumption ($\pm 10\%$)	Boost 0.07 Gal/hr (0.28 L/hr) High 0.06 Gal/hr (0.23 L/hr) Medium 0.04 Gal/hr (0.14 L/hr) Low 0.03 Gal/hr (0.10 L/hr)
Air Flow ($\pm 10\%$)	48 cfm Boost 40 cfm High 27 cfm Medium 19 cfm Low
Operating Voltage Range	10.5 - 16 vdc at 12 vdc 21 - 32 vdc at 24 vdc
Overheat Temperature ($\pm 10\%$)	240°F (115°C)
Ambient Operating Temperature	-40°F to 158°F (-40°C to 70°C)
Weight	6.0 lbs. (2.7 kg)

12 VOLT FANTASTIC ROOF MOUNTED CEILING FAN

The roof mounted ceiling fan must be cleaned and serviced regularly to ensure reliable service. Temporarily remove the wood cover before accessing the roof air vent fan assembly and refer to the image below when servicing the unit.

Replacing the Fuse – Gain access to the black cap and follow these steps:

- STEP 1** Turn the black cap counter-clockwise by one-quarter turn;
- STEP 2** Pull the cap down gently. The fuse is on the back of the cap;
- STEP 3** Check whether the wire is defective within the glass;
- STEP 4** If necessary, remove the fuse from the cap;
- STEP 5** Insert a new fuse of the same type (4 A fuse); and,
- STEP 6** Screw the cap back on again tightly.



Cleaning the Fan Blades – For clean, smooth operation follow these steps:

- STEP 1** Open the cover hood completely;
- STEP 2** Remove the safety catch;
- STEP 3** Remove the grille ring by holding the tab with one hand and pulling straight down. Support the grille assembly with the other hand to protect the grille ring from breaking. Removing the grille ring may initially be difficult but once you have disassembled it several times it gets easier;
- STEP 4** Hold the fan blades with one hand so that it does not rotate and remove the screw from the hub surface in the middle of the fan blade;

STEP 5

Hold the fan blades with both hands and pull down firmly. Move the fan blades bit by bit vertically and horizontally if necessary, so that it slides off the motor shaft;

STEP 6

Clean the grille ring and the fan blades with window cleaner, non-abrasive detergent and warm water, or in a dishwasher.

STEP 7

Once the grille ring and fan blades are clean and dry, you can apply a water-based protective agent and polish the grille ring and fan blades to a high gloss. This reduces dust and dirt deposits and makes cleaning easier; and,

STEP 8

Reassemble the fan again by following the steps in reverse order.

STUCK COVER HOOD

In warm climates, the cover hood may stick to the base seal. This can also happen when it has not been opened regularly. **In the event of a stuck cover hood follow these steps:**

- STEP 1** Open the cover hood completely;
- STEP 2** If the seal is damaged, replace the seal;
- STEP 3** Clean the underside of the cover hood and the seal with methylated spirits or solvent;
- STEP 4** If available, apply a water-based protective agent. Leave the protective agent to dry;
- STEP 5** Polish the cover hood with a soft cloth; and,
- STEP 6** Apply an even layer of silicone on the seal.

REMOTE CONTROL

Your coach may include the optional remote control for the FANTASTIC roof fan. **For remote control care and battery replacement please follow these steps:**

STEP 1

Keep the remote control dry. If it gets wet, wipe it dry immediately;

STEP 2

Only use and store the remote control in environments with normal temperatures;

- STEP 3** Keep the remote control clean. If necessary, wipe it with a damp cloth;
- STEP 4** Remove AA batteries prior to non-use and extended storage times.
- STEP 5** Polish the cover hood with a soft cloth; and,
- STEP 6** Apply an even layer of silicone on the seal.

REMOTE CONTROL BATTERY REPLACEMENT

The roof fan remote control requires two AA size batteries to operate. Please refer to the image below when replacing the batteries.

Follow these steps to replace the remote control batteries:

- STEP 1** Open the cover of the battery compartment on the back of the remote control;
- STEP 2** Replace the old batteries with two new AA batteries;
- STEP 3** Make sure that the positive and negative terminals of the batteries correspond to the positive and negative markings in the battery compartment;
- STEP 4** Close the battery compartment, place the alignment tab into the square hole on the back of the remote control; and,
- STEP 5** Press the lid of the battery compartment down until the catch clicks into place.

The following lists the FANTASTIC roof mounted ceiling fan's specifications. **Please refer to this information to keep your fan operating properly.**

SPECIFICATIONS

FanTastic Vent	Model 7350	Model 2250-7300
Voltage	12 Volts	12Volts
Max. power consumption	30 Watts	36 Watts
Noise level	< 40 dB(A)	< 40 dB(A)
Dimensions WxDxH	471x471x190 mm	471x471x190 mm
Weight	11.2 lbs. (5 kg)	11.2 lbs. (5 kg)



WARNING

Only operate the FANTASTIC roof fan when the grille ring is

fit. Touching an un-guarded fan can cause damage to the equipment and may result in a serious physical injury.

VENTLINE VANAIR ROOF VENT (BATH FAN)

The Ventline Vanair Roof Vent with the 12-volt fan was designed to be maintenance free. **To ensure the fan is operating and venting efficiently be sure to follow cleaning procedure listed in this section.**

- STEP 1** Clear the area under the vent fan of anything to prevent any dust or dirt from falling on them;
- STEP 2** Put on safety glasses to protect your eyes from dirt or dust falling in them;
- STEP 3** Remove the two screws that secure the pull-down handle;
- STEP 4** Remove the two screws that secure the vent's screen;
- STEP 5** Remove the thumb nut securing the switch;
- STEP 6** Gently remove the screen. Rinse the screen and thoroughly dry it; cleaner – with non-abrasive detergent and warm water – in a dishwasher;
- STEP 7** Wipe the fan blades with a dampened lint free micro fiber towel; and, dry, you can apply a waterbased protective agent and polish the grille ring and fan blades to a high gloss. This reduces dust and dirt deposits and makes cleaning easier; and,
- STEP 8** Reverse the process to reassemble the unit.



■ SUBURBAN NAUTILUS WATER HEATER

To ensure your on-demand water heater direct vent gas with direct spark ignition system performs efficiently, **inspect the system annually following these guidelines:**

STEP 1 Periodically inspect unit for soot.

STEP 2 If soot is present anywhere on water heater, immediately shut unit down and contact your dealer or a qualified service person.

STEP 3 Soot is a sign of incomplete combustion and must be corrected before operating water heater.

Areas to check would include:

- a. Check for an obstruction in the exhaust vent cap, located at the driver's side rear of the coach.
- b. Check vent to see that no foreign material has accumulated to prevent flow of combustion and ventilating air.
- c. Check to ensure no flame is present at the burner orifice or the burner whenever the main gas valve is closed. This can be checked by turning the "ESPAR" switch to the "Off" position at the Firefly display.

STEP 4



SUBURBAN IW60 EXHAUST VENT CAP

STEP 5 Periodically check wiring and wire connections to be sure wiring is not damaged/frayed

STEP 6 Make sure all terminals and connections are tight and no corrosion is present.



DANGER

If this appliance is not maintained in accordance with the instructions in this manual, then the risk of a fire and / or Carbon Monoxide (CO) gas poisoning exists which can damage your coach and cause serious physical injuries or death.



WARNING

For your safety, any repairs to the Suburban Nautilus water heater should be performed at your authorized American Coach dealership by a qualified service technician. Attempting to repair the unit yourself could damage the coach and / or the water heater.

■ 12-VOLT 6 GAL. WHALE WATER HEATER

WHALE Electric Water Heaters are designed with the very latest technology. All heaters are manufactured from the highest quality materials and designed to specifically withstand extremely harsh environmental conditions. Periodic maintenance is required to ensure top performance of the heater. **Follow these inspection and maintenance steps:**

STEP 1 Check heat exchanger lines for leaks at regular intervals. A leak in the system will cause coolant loss and may damage engine.

STEP 2 Flush tank periodically to help prevent build-up of deposits.

PROTECT AGAINST DAMAGE FROM FREEZING

Temperatures (32° F or less) Please review the following:

STEP 1 Drain tank by fully opening drain valve.

STEP 2 Open T&P valve to help relieve vacuum in tank. (See item 2 in exploded view)



WHALE S360EW DRAIN VALVE

It is recommended that you winterize your freshwater system. First complete steps 1 and 2, then follow instructions of your local supplier on the use of non-toxic propylene glycol antifreeze to protect the heater and your water lines while the coach is in storage. Refer to SECTION 8 (PLUMBING) for detailed water system winterization procedures.



NOTE

If the Whale water heater has been run without water and it subsequently fails to function properly, fill the heater's internal water tank with water and push the electric reset button high limit switch, which is located under the wiring access cover on the unit before calling for service.

NOVA KOOL REFRIDGERATOR (MODEL R-3800 DC OR MODEL RFU8220DC)

The Nova Kool refrigerator was designed to be maintenance free. To ensure the refrigerator is operating and cooling efficiently be sure to follow the defrost and cleaning procedure listed in this section. Follow the operation guidelines found in SECTION 10 (APPLIANCES) of this manual and the NOVA KOOL Installation and Troubleshooting Manual that accompanied your coach at the time of delivery.

■ Defrost & Cleaning

The frequency of defrosting depends upon the number of door openings, ambient temperature and the humidity level. Typically, it is a good practice to defrost once there is 1/4" of frost buildup on either side of the refrigerator's evaporator (cold plate) in the freezer section.

Use the following procedure to defrost the refrigerator on a regular basis:

- | | |
|---------------|---|
| STEP 1 | Shut off the unit at either the breaker panel or by turning the thermostat counterclockwise to the OFF (0) position. |
| STEP 2 | Prop the door open and place an absorbant towel in the bottom of the refrigerator to catch water as it defrosts. |
| STEP 3 | Allow the unit to defrost naturally. Do not attempt to speed up the process with a knife or scraper, which could easily damage the unit. |
| STEP 4 | Once defrosted, clean the interior of the refrigerator with a soft lint free cloth and a non-abrasive cleaner (anti-bacterial dish washing detergent and baking soda are excellent for this purpose). Do not use any type of abrasive pads, as they will scratch the surfaces. Do not use steel wool on the stainless-steel exterior front panel as it will scratch the finish. |

HIGH POINTE INDUCTION MICROWAVE OVEN (MODEL EC028KD7)

The High Pointe Induction Microwave Oven was designed to be maintenance free. To ensure the induction microwave oven is operating effectively be sure to follow the operation guidelines in the High Pointe Instruction Manual.

Clean the interior of the convection / microwave oven with a soft lint free cloth and a non-abrasive cleaner (anti-bacterial dish washing detergent and baking soda are excellent for this purpose). Do not use any type of abrasive pads, as they will scratch the surfaces. Do not use steel wool on the stainless-steel interior or exterior of the unit as it will scratch the finish.

■ TRUE INDUCTION SINGLE BURNER COOKTOP (Model IT-1B)

The induction cooktop is designed as a maintenance free unit.

To keep the unit clean follow these procedures:

- | | |
|---------------|---|
| STEP 1 | Before cleaning the cooktop, always switch the appliance "Off", and wait for it to be completely cool; |
| STEP 2 | Gently wipe down the unit after each use to remove any food residue or water stains. A dampened (not dripping wet) lint free towel with some anti-bacterial liquid dishwashing detergent is excellent for this purpose. If necessary, use a plastic blade to scrape away any burnt-on food residue. (Never use a metal razor blade or sharp metal tool on the surface). |
| STEP 3 | Use a vacuum to gently remove any dust or crumbs that have accumulated inside the cooktop recess. |

SPECIFICATIONS

TRUE INDUCTION SINGLE BURNER COOKTOP	MODEL TI-1B
Power	1600W
Voltage	120V ~ 60Hz
Temperature Range	150°F - 450°F
Level Selection	1 through 10
Max Time	150 Minutes
Material	Glass Ceramic Top
Dimensions	11 13/16" width x 14 15/16" length x 2 13/16" height

**WARNING**

Do not drench the cooktop with water or cleaning products, and do not use abrasive cleaners or oil-based cleaners. Damage to the cooktop will occur.

■ 100-WATT ROOF TOP SOLAR CHARGING SYSTEM (SOLAR CHARGE CONTROLLER ZAMP ZS-30A)

The solar panels require very little maintenance to function properly. The inspection and cleaning requirements are based on the environment and parking location. For the solar panels to perform efficiently they need periodic light cleaning to make sure that dirt, water stains, leaves and other debris do not reduce or prevent their direct access to sunlight.

To properly maintain your solar panels, follow these procedures:

STEP 1

Use a commercially available car washing solution to wash the vehicle exterior to remove any debris from the roof and the solar panels. Carefully loosen any stubborn dirt and debris with a soft lint free cloth, being careful not to damage the glass shell on the solar panel(s);

STEP 2

Dry the vehicle roof and the solar panel(s) thoroughly; and,

STEP 3

In a shaded area out of direct sunlight, apply a coating of high-quality carnuba car wax to the glass outer layer of each solar panel. Buff them to a shiny finish by hand (do not use a machine to polish the glass).

**WARNING**

Avoid using harsh chemicals including ammonia, abrasives, and pressure washers, which could damage your solar panels. Do not apply pressure to the glass outer shell of the panels as they could crack. Never use a machine to polish the glass.

**NOTE**

The solar charger / controller is designed for indoor use only and should never be exposed to rain or moisture. Do not disassemble the controller. If you suspect your solar charging system is not functioning properly contact an authorized dealership for further assistance.

■ LPG TANK AND SYSTEM

Your vehicle is equipped with a permanently mounted tank for Liquid Propane Gas (LPG) with a remote fill and remote gas supply shut off switch. LPG burns with a clean blue flame and it powers the Onan QG 2500 LP Generator and the Suburban IW60 water heater if your coach is equipped with those options. Some coaches are not equipped with an LPG tank. For example, the Freedom Lithium® package does not include the LPG tank.

■ LPG Regulator

An LPG regulator is installed on the tank to provide low-pressure service, with a normal outlet pressure setting of 11.5-in. water column. There are no owner / operator maintenance procedures for this regulator. Only personnel trained in the proper procedures, codes, standards, etc., should service the LPG regulator on your coach. Have the tank, regulator, hoses, and the shutoff switch at the fill port inspected annually by an authorized dealership or certified LPG technician. Replace the regulator if there is evidence of water in the spring case or signs of external corrosion on the spring case.

LPG CONNECTIONS

A quick-connect, low-pressure LPG connection is located under the passenger side rear quarter panel behind the wheels. It is a utility connection to use for an outside grill or other LPG appliance. **Perform the following inspections and routine maintenance procedures monthly and any time the coach has been returned to service following long term storage:**

STEP 1

Visually inspect the connections, hoses, and covers for wear, cracks or other damage;

STEP 2

Check that the remote outlet LPG shut off valve is turned off;

STEP 3

Slide the collar on the female end back and plug a male accessory hose into the remote accessory connection;

STEP 4

Release the collar and check that the hose is properly connected by giving a firm pull on the hose;

STEP 5

Turn the LPG remote shut off valve on and recheck all connections to the external accessory appliance and the quick connection to be sure no leaks are present;

STEP 6

Follow the lighting instructions on the remote appliance (e.g., barbecue grill) and test the appliance to ensure it lights and operates properly;

STEP 7

Turn off the remote accessory shut off valve at the coach and allow the appliance to burn off any LPG remaining in the hose;

STEP 8

Disconnect the remote appliance and its hose from the coach.

To clean the remote fill and accessory connection service compartment perform the following steps:

STEP 1

Open the cover and gently wash the area with a commercially available car wash solution. Do not use high pressure water;

STEP 2

Rinse away any soap residue with a gentle stream of water;

STEP 3

Use high pressure air or a clean lint free towel to remove any remaining water and to dry the LPG fittings thoroughly before use.



WARNING

The electric gas shut-off solenoid closes automatically when 12-volt DC power is not present. The solenoid will reopen when power is restored. When filling the tank, activate the solenoid shutoff switch at the remote filling / accessory connection compartment until the tank has been filled. Then turn the switch off.



WARNING

Moisture in the LPG tank will cause a malfunction of the regulator in controlling proper pressure. This may cause the water heater or the generator to malfunction. If you suspect this has happened, take your coach to a filling station and have the tank purged and refilled with high quality LPG.



DANGER

Do not use open flame to search for potential leaks in the LPG system. An explosion or fire could occur, resulting in serious physical injuries and / or death. LPG has a distinct trace odor. If you smell gas, and the generator or other appliances fail to stay on, or any other abnormal situation occurs, use the remote solenoid switch to shut off the tank valve and contact your authorized dealership of a qualified LPG service center. Do not attempt to operate the generator or water heater with a defective LPG system.

■ XANTREX FREEDOM XC2000 / XC3000 Inverter/Charger

The Xantrex Freedom series inverter/charger is designed to be maintenance free except for minor inspections and cleaning. If you have any problems or concerns contact your dealership or a qualified Xantrex technician. **To maintain your inverter you should perform the following steps:**

STEP 1

Ensure all power to the coach is off. Disconnect the shore power cable and turn off the master battery switch at the main Firefly network interface display;

STEP 2

Remove the louvered vent cover beneath the rear power folding lounge seat on the passenger side of the coach;

STEP 3

Use an inspection light to illuminate the inverter compartment and look for signs of dust, lint, and dirt buildup;



NOTE

Do not allow the tank to run completely empty as this may allow air to enter the gas lines. In this event the air must be bled from the lines. To bleed the lines, start the generator first, which may take several attempts before LP gas reaches the carburetor. Follow the generator starting procedures in SECTION 9 (ELECTRICAL SYSTEMS) of this manual. Once the generator starts and runs normally, shut it off, and then run the hot water until the Suburban hot water heater ignites.

STEP 4

Using a vacuum hose, gently vacuum out the compartment to remove any dust, lint, or dirt that may have built up inside;

STEP 5

If you can reach the inverter casing without disturbing any wiring, gently wipe down the exterior of the unit with a soft lint free cloth to remove any dust, lint, or dirt from the unit; and,

STEP 6

Clear any lint, dust, or dirt from the front and rear of the louvered ventilation cover before reinstalling it.



NOTE

Some coaches have a hinged hatch which allows direct access to the inverter.



DANGER

Do not attempt to disassemble the Freedom XC2000 / XC3000. The inverter contains no user-serviceable parts. Attempting to service the unit yourself could result in permanent damage to the inverter and your coach's electrical system, serious burns or physical injuries and / or death.

■ DOMETIC PENGUIN II (640315CXX1C0 AIR CONDITIONER)

To keep your air conditioner functioning well, perform the following maintenance procedures:

AIR FILTER

The air filter should be inspected and cleaned periodically (approximately every 2 weeks of operation). **Follow these steps:**

STEP 1

Remove the return air filters from the end of the air distribution box;

STEP 2

Gently wash the filters with warm soapy water, being careful not to damage them;

STEP 3

Allow the filters to air dry thoroughly;

STEP 4

Reinstall the filters.



NOTE

Never run the unit without both return air filters in place. This could allow lint to plug the unit evaporator coil, which may degrade the performance of the unit over time.

AIR DISTRIBUTION BOX HOUSING

Clean air distribution box housing with a soft lint free cloth dampened with a mild detergent. Do not use furniture polish or scouring powders.

FAN MOTOR

The blower motor is factory lubricated and requires no service.

FROST FORMATION ON THE COOLING COIL

A small amount of frost on the coil is not unusual, and in some environmental conditions, ice may form on the evaporator coil. In this situation, the air will be very cold, and the air speed will be very low. Icing will be visible throughout the entire network with the filters removed. **To improve efficiency, follow these steps:**

STEP 1

Inspect the filter and clean if necessary;

STEP 2

Make sure the air vents are open and not obstructed;

STEP 3

If outside temperatures are relatively low, adjust the thermostat control knob to a warmer setting; and,

STEP 4

If frosting continues, operate the unit on fan only until the cooling coil is free of frost. Then resume normal operation.

If the frost condition persists, contact your dealership for assistance.

UNIT DOES NOT OPERATE

If the air conditioner fails to operate or the unit is not operating efficiently, **please take the following troubleshooting steps:**

STEP 1

Check the shore power cord or the optional Onan LP generator to ensure they are supplying power. This includes checking the circuit breaker on the optional Onan QG 2500 LP Generator, which may have tripped due to an overload condition;

STEP 2

Inspect the air conditioner's circuit breaker in the 120-volt AC distribution panel;

STEP 3

If you are unable to reset the air conditioner, call your dealership to request assistance. This unit may need to be serviced by qualified service personnel only.

■ PRO AIR ROOF AIR CONDITIONER (12V 20,000BTU)

RETURN AIR FILTER CLEANING

Filter should be cleaned once a month during normal conditions and daily or weekly if conditions are warranted.

STEP 1	Turn the system off at the Firefly network interface display;
STEP 2	Turn the knobs counterclockwise ¼ of turn to remove the intake grill and filter;
STEP 3	Gently remove any dirt and dust from the filter with a vacuum and wash the filter with warm soapy water. Rinse the filter; and,
STEP 4	Allow the filter to dry thoroughly before re-installing it in reverse order.

CONDENSER COIL CLEANING

Clean the condenser and fins every year with soapy or non-acid based coil cleaning liquid in normal conditions or more frequently in extreme conditions to maintain the efficiency of your RV air conditioner. Eventually, if not cleaned properly the condenser fins may become clogged with dirt and dust. Do not use high pressure water or steam to clean the condenser fins.

Never run the air conditioner without the return air filter. Running the air conditioner without a filter may allow the evaporator coil to be plugged with dirt which will affect the performance of the air conditioner.



WARNING

Only trained and fully qualified technicians should test, repair, or adjust vehicle refrigeration equipment. Even something as simple as tightening a belt can damage the equipment and put the uninformed individual at serious personal risk.

SEALANT

Constant vibration, sun, extreme temperatures, and weather exposure will degrade the flexibility and strength of exterior sealants over time, especially on the roof of the coach. Exterior sealants should be inspected annually and replaced as needed. This is very important to prevent potential water damage to your coach over time. The appropriate sealants are available through your American Coach Dealership and they can provide this service for you. Read and follow all label directions carefully when applying new sealant.

■ RECOMMENDED TOOLS

We recommend that owners maintain an onboard tool kit to handle any emergency repairs and for convenience purposes. This practice is especially important for coach owners who plan to travel extensively and far from their home base. **You may wish to carry some or all of the listed tools below in addition to others that you deem useful:**

TOOL KIT
Multi-bit Screwdriver – Flat Head, Phillips Head, and Square Drive bits
3/8" Drive Ratchet Wrench
3/8" Drive Socket Extensions (3" & 6" long)
3/8" Drive Oil Filter Wrench (84mm 14 flute)
3/8" Drive Metric Sockets (10mm, 11mm, 12mm, 13mm, 14mm, 15mm, 16mm & 17mm)
3/8" Drive SAE Sockets (1/4in, 5/16in, 3/8in, 7/16in, 1/2in, 5/8in, 9/16in & 5/8in)
Adjustable Wrench
Vise-Grips
Pliers
Claw Hammer
Duct Tape / Electrical Tape
Flashlight
Pocket Knife / Utility Knife
Tire Pressure Gauge
Allen Wrench set
Wire Cutters / Insulation Removal Tool / Crimp tool and an assortment of crimp on terminals
Zip Ties
Bubble Level
Tape Measure
Digital Multimeter (auto ranging)
Thread Seal Tape
Leather Work Gloves
Disposable Nitrile Gloves
Battery Jumper Cables
Smart Battery Charger (AGM 12 volt 10 Amps)
10 Gauge Outdoor Extension Cord (25 ft)
Package of Lint Free Microfiber Towels

■ RECOMMENDED SPARE PARTS

We recommend owners consider carrying a small quantity of spare parts onboard your coach for emergency and routine use. This is particularly helpful and important for extended travelers who venture far from their home base. **The following is a list of common parts associated with your coach, which may vary depending upon the vehicle model and installed options:**

BRAND	PART NUMBER	DESCRIPTION
Battery Tech	24M-AGM	Battery, AGM, 70 AMP HOUR
Battery Tech	8D-330	Battery, AGM, 330 AMP HOUR
Dragonfly	DFEGC2H	Battery, LIFEPO4, 100 AMP HOUR
Collins	Q115	Circuit Breaker, 120-VOLT AC (15 AMP)
Collins	Q120	Circuit Breaker, 120-VOLT AC (20 AMP)
Collins	Q130	Circuit Breaker, 120-VOLT AC (30 AMP)
Dometic	640315CXX1J0	Filter, Air Conditioner, Dometic 120-VOLT, 13500 btu
Pro Air	51 001 265	Filter, Air Conditioner, Pro Air 12-VOLT, 20000 btu
Mercedes Benz	270-180-01-09	Filter, Engine Oil, 3.0 Turbo Diesel (MY 2019-2021)
Hella	88194	Fog Lamp Assembly- HELLA 2500 Light Kit
Collins	ATM-5	Fuse, 12-VOLT DC, ATO (5 AMP)
Collins	ATM-10	Fuse, 12-VOLT DC, ATO (10 AMP)
Collins	ATM-15	Fuse, 12-VOLT DC, ATO (15 AMP)
Collins	ATM-20	Fuse, 12-VOLT DC, ATO (20 AMP)
Collins	ATM-30	Fuse, 12-VOLT DC, ATO (30 AMP)
Optronics	UCL09CB	LED Overhead Reading Light
ITC	69231PC-94KE	LED Shower Light
Carefree of Colorado	R001714	LED Awning Ligth Strip
ITC	69767B-CH	LED Exterior Porch Light
ITC	TPE1263-55012	LED Interior Accent Light Strip
Mercedes-Benz	9147	Paint, Touch Up, Arctic White
Mercedes-Benz	9040	Paint, Touch Up, Black
Mercedes-Benz	9775	Paint, Touch Up, Iridium Silver
Dicor	501LSB	Sealant, Self Leveling, Black
Dicor	501LSW	Sealant, Self Leveling, White
Kidde	FG250RV-48B BRK ION	Smoke Alarm

■ COACH MAINTENANCE SCHEDULE



WARNING

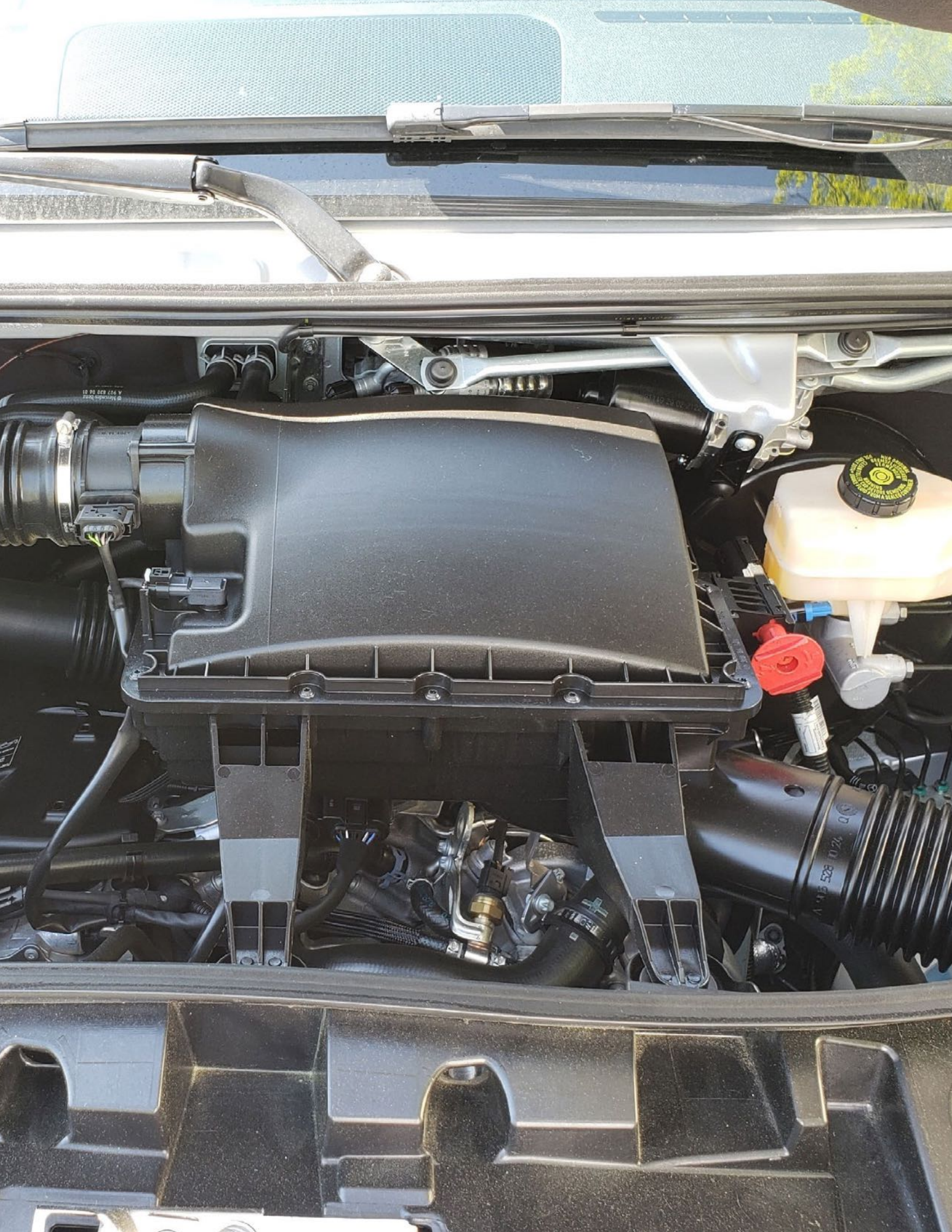
Failure to maintain a proper schedule of inspections, maintenance and service of the accessories, appliances, equipment, and options installed on your coach could result in premature failures and / or dangerous / unreliable operating conditions. Read all accessory and appliance instructions and manuals thoroughly before operating the equipment. Contact your authorized dealership for assistance with replacing any damaged / defective parts, and for service and maintenance support.

FREQUENCY	ITEM	ACTION
Daily	Walk Around Vehicle	Inspect exterior 360 degrees
Daily	Check Tires	Visually inspect for damage or wear
Daily	Chassis Fluids (oil, brake, steering)	Check all fluid levels before driving
Daily	Tank Status	Check coach's water and holding tank levels
Daily	Fuel	Check diesel fuel level
Daily	Propane (if equipped)	Check tank level
Daily	Onan Generator	Check for fuel or exhaust leaks
Daily	Cargo and Luggage Security	Check security and distribution of cargo weight

FREQUENCY	ITEM	ACTION
20 hours	Generator Oil (initial change)	Change oil, inspect for leaks
100 hours or Monthly	Generator Oil	Change oil, inspect for leaks
5000 Miles or Monthly	Wheel Lug Nuts	Re-torque to Mercedes-Benz specifications
Monthly	Batteries	Inspect all batteries for condition and corrosion
Monthly	Smoke Alarm & CO Detector	Inspect and test for proper operation
Monthly	GFI Circuit Breaker	Press test button and reset
Monthly	Air Conditioner Filters	Remove, clean, inspect and re-install
Monthly	Propane Water Heater Exhaust	Inspect for debris and carbon or soot buildup
Monthly	Holding Tank Gate Valves	Inspect for leaks
Monthly	Roof-Mounted Solar Panels	Wash, inspect, dry, and wax
Monthly	Exterior	Wash and wax as appropriate

FREQUENCY	ITEM	ACTION
150 hours or Annually	Generator Air Filter	Inspect and replace air filter
Annually	Generator Spark Plug	Inspect, clean, or replace
Annually	Generator Carburetor	Inspect and clean
Annually	Liquid Propane (LP) Tank	Inspect
Annually	Smoke Alarm & CO Detector	Inspect, replace battery, and test
Annually	Fire Extinguisher	Inspect and replace if below full state of charge
Annually	Roof Sealant	Inspect, remove, and replace as necessary
Annually	Roof Air Conditioner	Inspect, clean, and service as necessary
Annually	Interior Cabinetry and Doors	Inspect latches, drawers, and hinge hardware

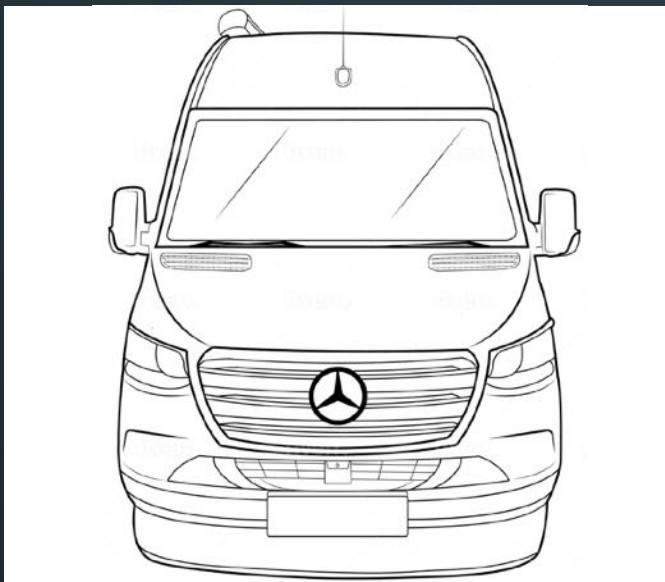
FREQUENCY	ITEM	ACTION
Annually	Fresh Water Tank	Sanitize annually or sooner if needed
Annually	Holding Tanks	Drain and flush prior to long-term storage
Annually	Holding Tank Gate Valves	Clean, exercise, and lubricate valves
Annually	Macerator Pump	Remove, clean, inspect, lubricate, and re-install
MB Mileage Based or Annually	Tires	Inspect, rotate, and replace if worn or cracked
MB Mileage Based or Annually 1	Steering Alignment	Inspect and align if required
MB Mileage Based or Annually 1	Air Bag Suspension	Inspect, and check for leaks
MB Mileage Based or Annually 1	Shock Absorbers	Inspect and replace if worn
MB Mileage Based or Annually 1	Brakes	Service IAW Mercedes-Benz recommendations
MB Mileage Based or Annually 1	Coolant	Service IAW Mercedes-Benz recommendations





SECTION 14

Schematics and Illustrations



Schematics and Illustrations

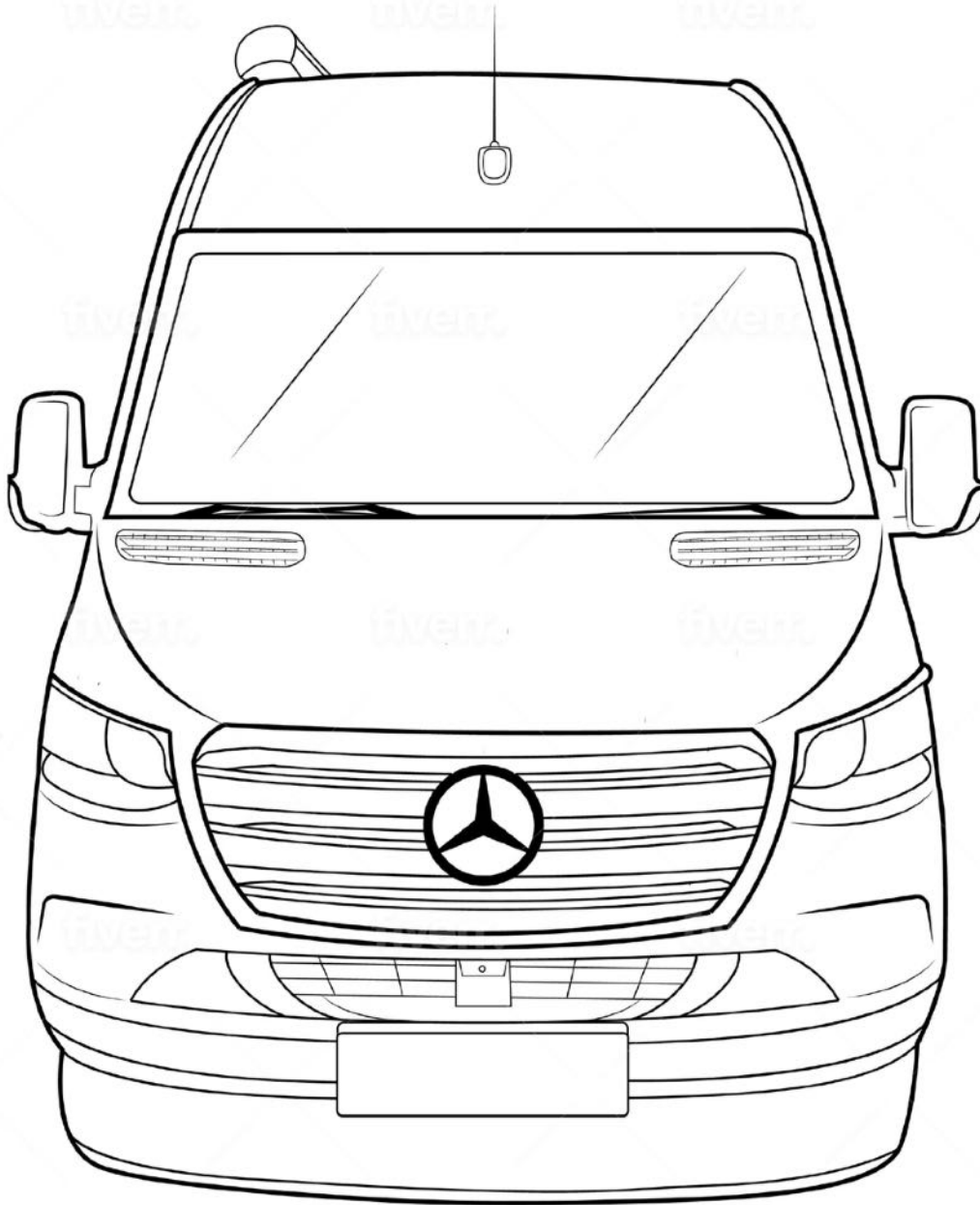
■ Specifications

AMERICAN COACH PATRIOT / MIDWEST PASSAGE				
CHASSIS	2500	2500 (4 X 4)	3500XD	3500XD (4 X 4)
Midwest Automotive Designs Warranty	3 years / 36000 miles	3 years / 36000 miles	3 years / 36000 miles	3 years / 36000 miles
Mercedes-Benz Warranty	3 years / 36000 miles	3 years / 36000 miles	3 years / 36000 miles	3 years / 36000 miles
Mercedes-Benz Drivetrain Warranty	5 years / 100000 miles	5 years / 100000 miles	5 years / 100000 miles	5 years / 100000 miles
Engine	3.0L 6 Cylinder Turbo Diesel	3.0L 6 Cylinder Turbo Diesel	3.0L 6 Cylinder Turbo Diesel	3.0L 6 Cylinder Turbo Diesel
Horsepower/Torque	188 hp / 325 lb ft	188 hp / 325 lb ft	188 hp / 325 lb ft	188 hp / 325 lb ft
Emissions	BlueTEC® DEF / SCR	BlueTEC® DEF / SCR	BlueTEC® DEF / SCR	BlueTEC® DEF / SCR
Transmission	7G-Tronic 7-Speed Automatic	7G-Tronic 7-Speed Automatic	7G-Tronic 7-Speed Automatic	7G-Tronic 7-Speed Automatic
Axle Ratio	4.105	4.105	4.182	4.182
Wheel Base	144	144	170 / 170 EXT	170 / 170 EXT
GVWR	9050 lbs	9050 lbs	11030 lbs	11030 lbs
GAWR - Front Axle	4410 lbs	4410 lbs	4410 lbs	4410 lbs
GAWR - Rear Axle	5360 lbs	5360 lbs	7720 lbs	7720 lbs
GCWR	13930 lbs	13930 lbs	15250 lbs	15250 lbs
TWR Noseweight	500 lbs	500 lbs	500 lbs	500 lbs
Max Towing Capacity	5000 lbs	5000 lbs	5000 lbs	5000 lbs
Max Roof Load	331 lbs	331 lbs	331 lbs	331 lbs
Length Overall	274.3 inches	274.3 inches	290 inches	290 inches
Height Overall	110.9 inches	114.4 inches	110.6 inches	114.1 inches
Width Overall	92.3 inches	92.3 inches	95.5 inches	95.5 inches
Interior Height	74 inches	74 inches	74 inches	74 inches
Interior width (rear cgo doors)	68 inches	68 inches	68 inches	68 inches
Fresh Water	32 gal	32 gal	32 gal	32 gal
Grey Tank	27 gal	27 gal	27 gal	27 gal
Black Tank	15 gal	15 gal	15 gal	15 gal
Propane	15 gal / 63.6 lbs	15 gal / 63.6 lbs	15 gal / 63.6 lbs	15 gal / 63.6 lbs
Shore Power	L5-30 amp / 120 VAC	L5-30 amp / 120 VAC	L5-30 amp / 120 VAC	L5-30 amp / 120 VAC
Generator (Optional)	Onan QG 2500 LP	Onan QG 2500 LP	Onan QG 2500 LP	Onan QG 2500 LP
Inverter - Xantrex Standard XC 2000	2000 watt	2000 watt	2000 watt	2000 watt
Inverter - Xantrex Freedom XC 3000	3000 watt	3000 watt	3000 watt	3000 watt
Battery AGM	1 x 70 ah	1 x 70 ah	1 x 330 ah	1 x 330 ah

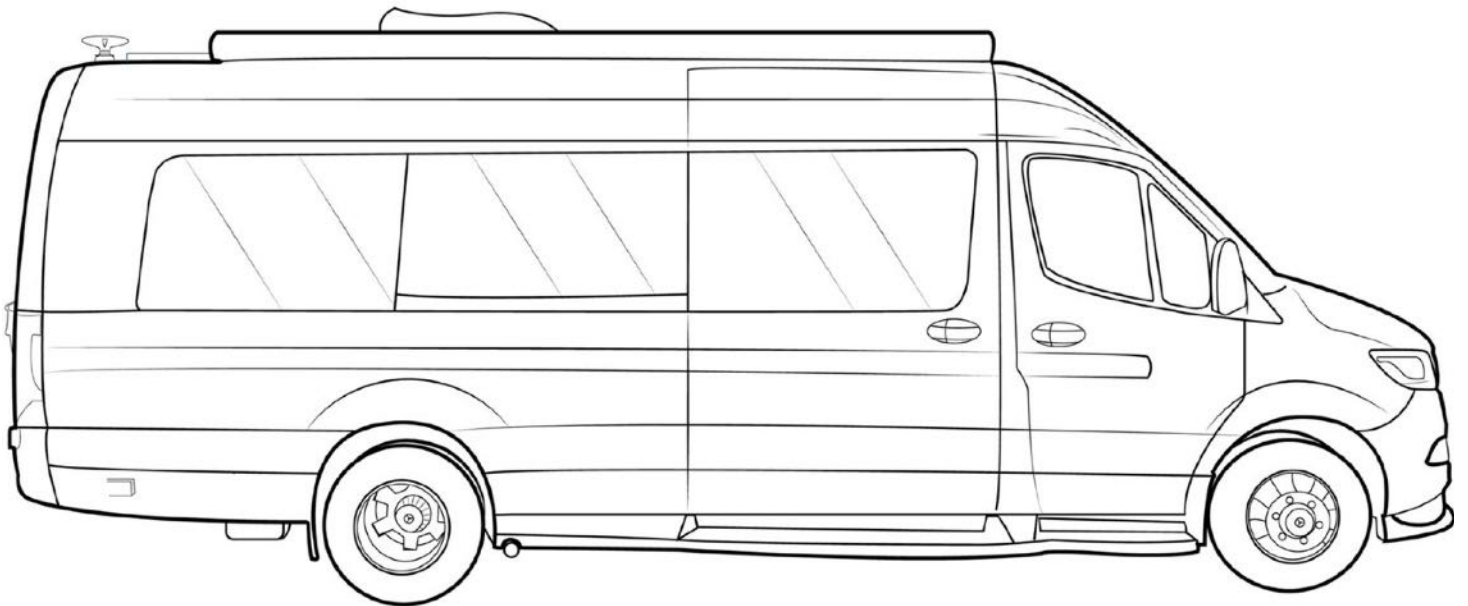
AMERICAN COACH PATRIOT / MIDWEST PASSAGE

CHASSIS	2500	2500 (4 X 4)	3500XD	3500XD (4 X 4)
Solar (Standard)	125 watts	125 watts	125 watts	125 watts
Batteries LiFePO 41	6 x 100 ah LiFePo batteries	6 x 100 ah LiFePo batteries	6 x 100 ah LiFePo batteries	6 x 100 ah LiFePo batteries
Solar (Standard w/ Generator)	230 watts	230 watts	230 watts	230 watts
Solar (Freedom Pkg)1	320 watts	320 watts	320 watts	320 watts
Charge Controller (ZAMP ZS-30A)	30 amps	30 amps	30 amps	30 amps
Heater - ESPAR Airtronic D2	2200 watts	2200 watts	2200 watts	2200 watts
Heater - Proair D3	2200 watts	2200 watts	2200 watts	2200 watts
Water Heater - Suburban IW60 (LP)	60000 btu	60000 btu	60000 btu	60000 btu
Water Heater - Whale S360EW1	30 amps	30 amps	30 amps	30 amps
Water Pump Shurflo 4008-101-A65	3 GPM @ 55 PSI / 12 VDC	3 GPM @ 55 PSI / 12 VDC	3 GPM @ 55 PSI / 12 VDC	3 GPM @ 55 PSI / 12 VDC
Dometic 640315CXX1C0 Air Conditioner	13500 btu / 120 VAC	13500 btu / 120 VAC	13500 btu / 120 VAC	13500 btu / 120 VAC
Pro Air Roof Air Conditioner1	20000 btu / 12 VDC	20000 btu / 12 VDC	20000 btu / 12 VDC	20000 btu / 12 VDC
Refrigerator Nova Kool R3800 DC	3.5 cu ft / 2.4 amps	3.5 cu ft / 2.4 amps	3.5 cu ft / 2.4 amps	3.5 cu ft / 2.4 amps
Refrigerator Nova Kool RFU 8220 DC	7.3 cu ft / 5.2 amps	7.3 cu ft / 5.2 amps	7.3 cu ft / 5.2 amps	7.3 cu ft / 5.2 amps
Convection Oven B-EC028BMR-B	Input 1500 watt / Output 1000 watt	Input 1500 watt / Output 1000 watt	Input 1500 watt / Output 1000 watt	Input 1500 watt / Output 1000 watt
True Induction T1-1B Cooktop	1600 watts / 120 VAC	1600 watts / 120 VAC	1600 watts / 120 VAC	1600 watts / 120 VAC
Front TV - LG3	27 inch / 120 VAC	27 inch / 120 VAC	27 inch / 120 VAC	27 inch / 120 VAC
Rear TV - Samsung	24 inch / 120 VAC	24 inch / 120 VAC	24 inch / 120 VAC	24 inch / 120 VAC
Fusion Apollo MS RA-770 Stereo	26 watts RMS / 70 watts peak	26 watts RMS / 70 watts peak	26 watts RMS / 70 watts peak	26 watts RMS / 70 watts peak
Front Speakers JL C2-525X	5.25 inch / 60 watts RMS max	5.25 inch / 60 watts RMS max	5.25 inch / 60 watts RMS max	5.25 inch / 60 watts RMS max
Rear Speakers JL C2-525X	5.25 inch / 60 watts RMS max	5.25 inch / 60 watts RMS max	5.25 inch / 60 watts RMS max	5.25 inch / 60 watts RMS max

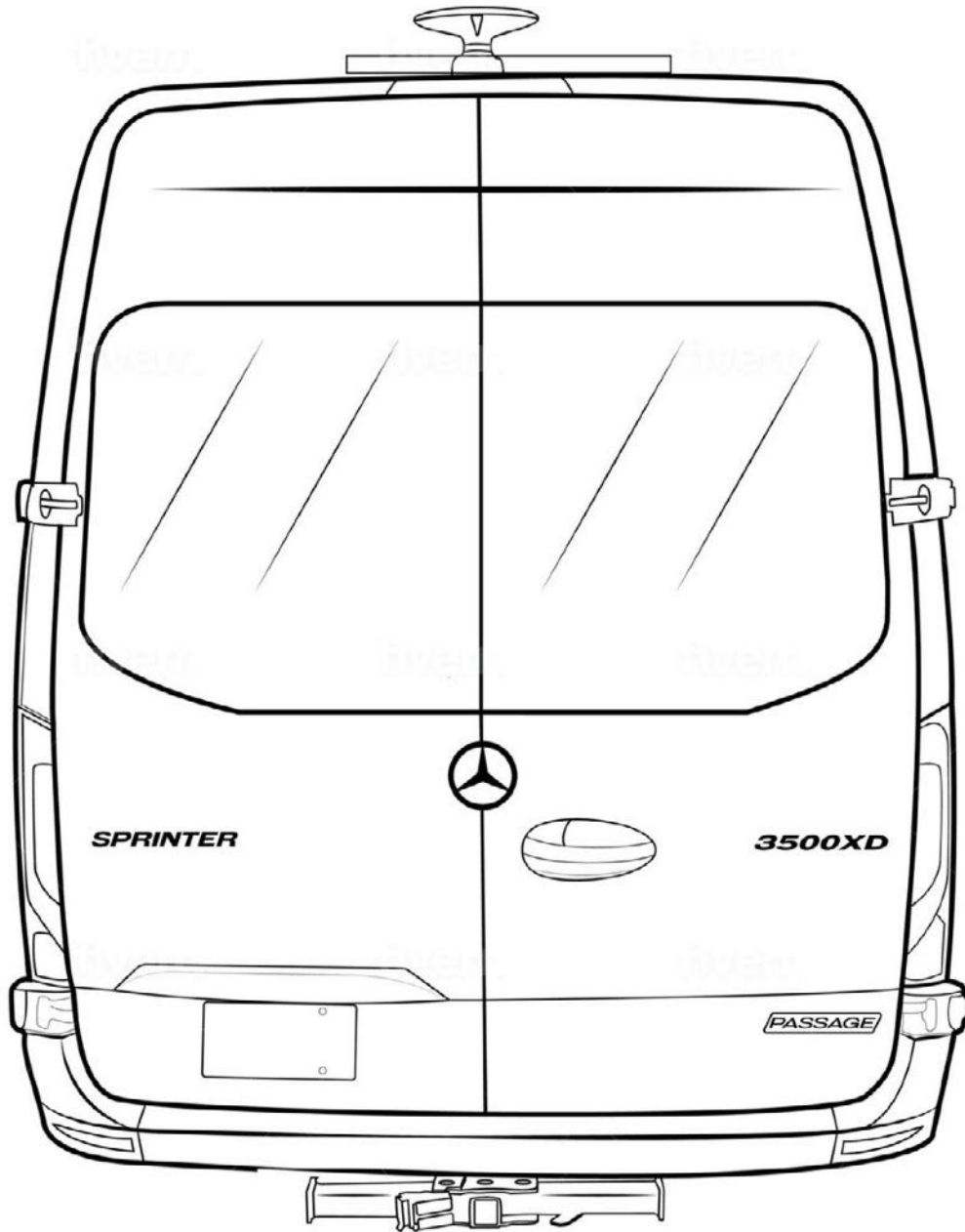
■ Illustrations



FRONT PROFILE

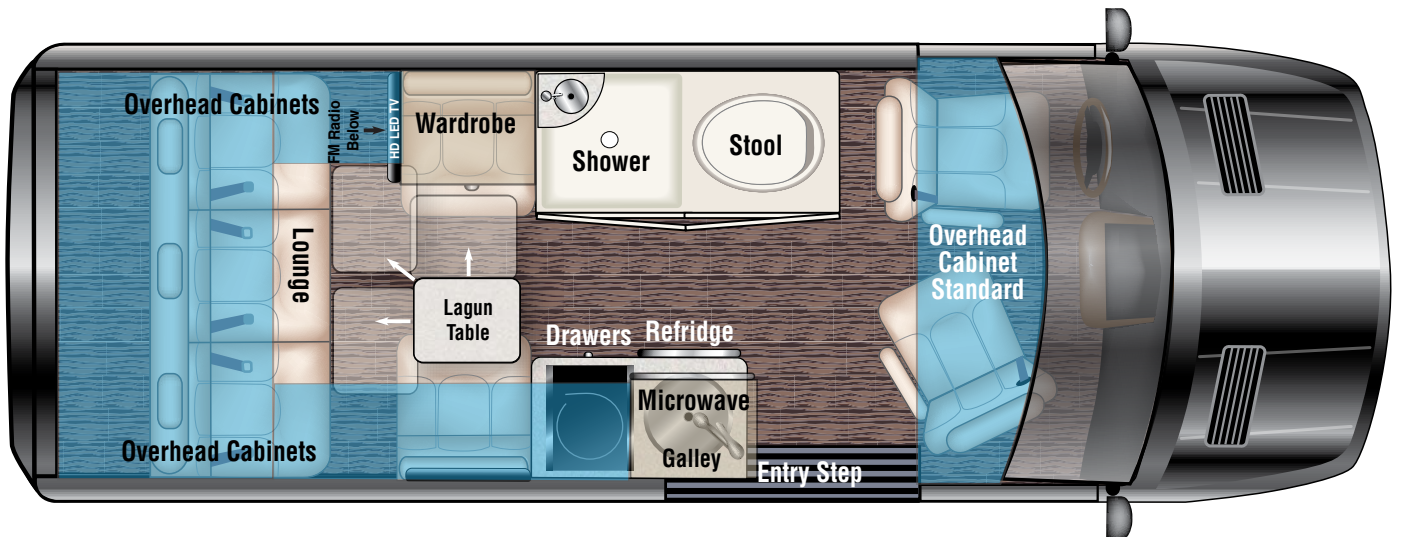


SIDE PROFILE

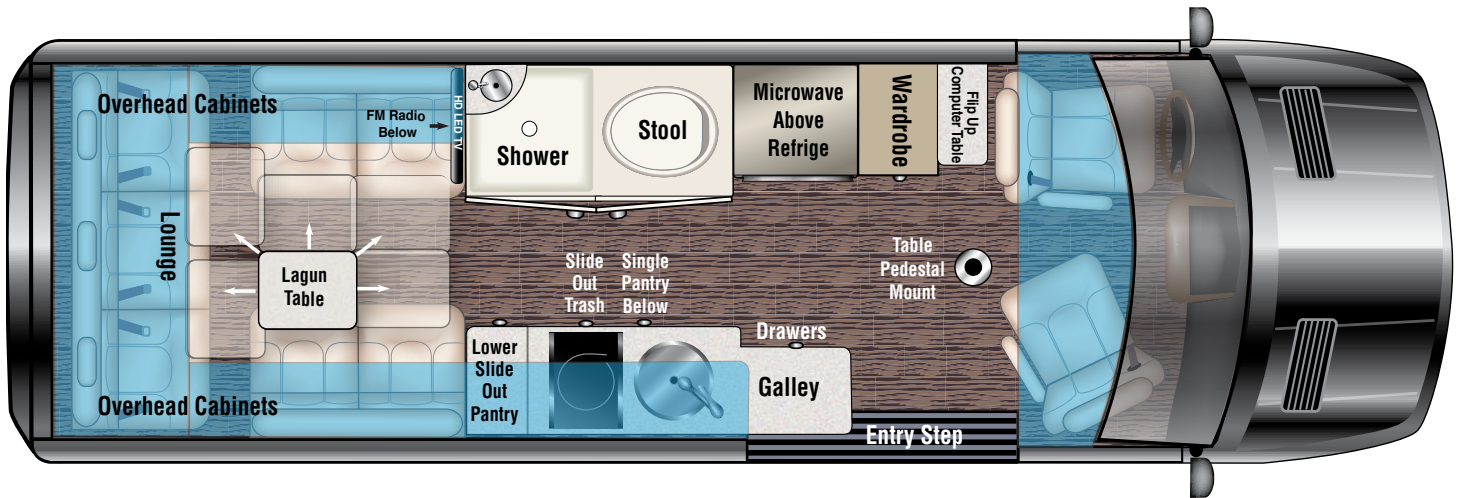


REAR PROFILE

■ Floor Plans



MERCEDES-BENZ - PATRIOT 144 - FD2

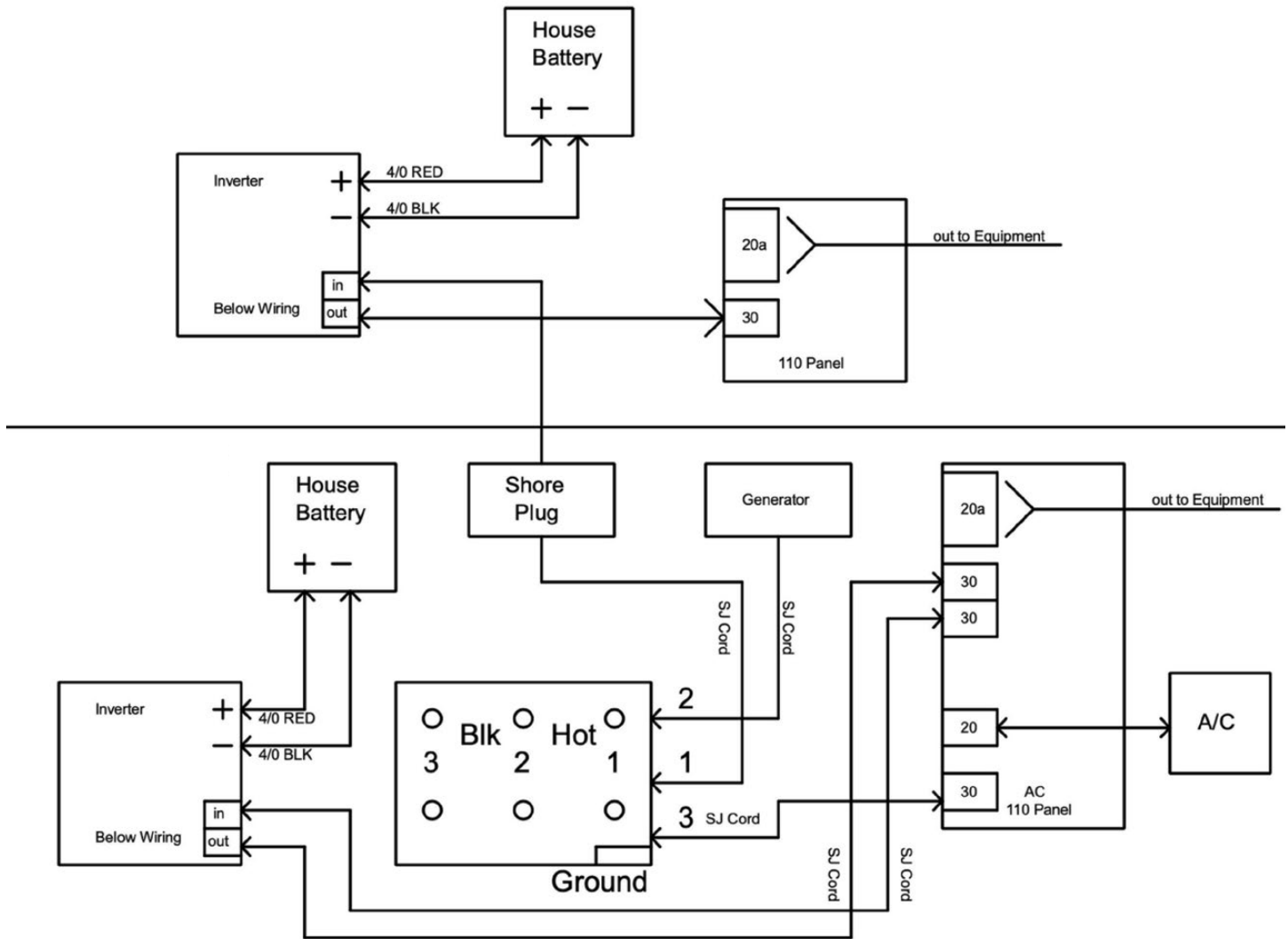


MERCEDES-BENZ - PATRIOT 170 EXT - MD2

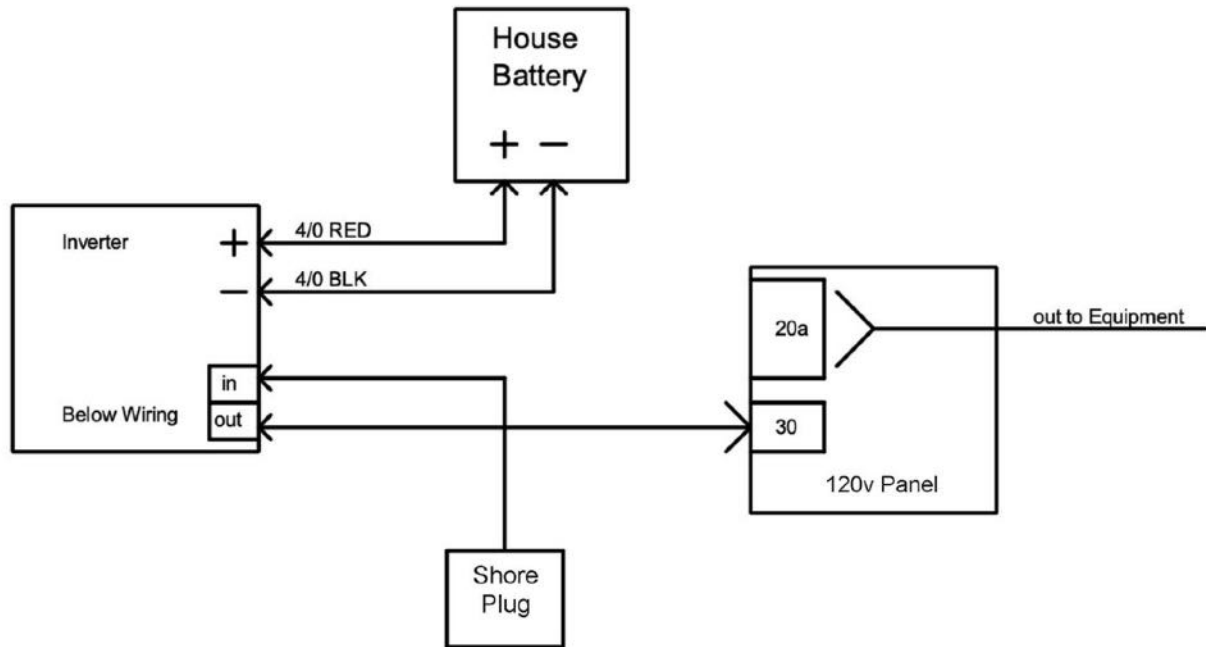


MERCEDES-BENZ - PATRIOT 170 EXT - MD4

■ Electrical

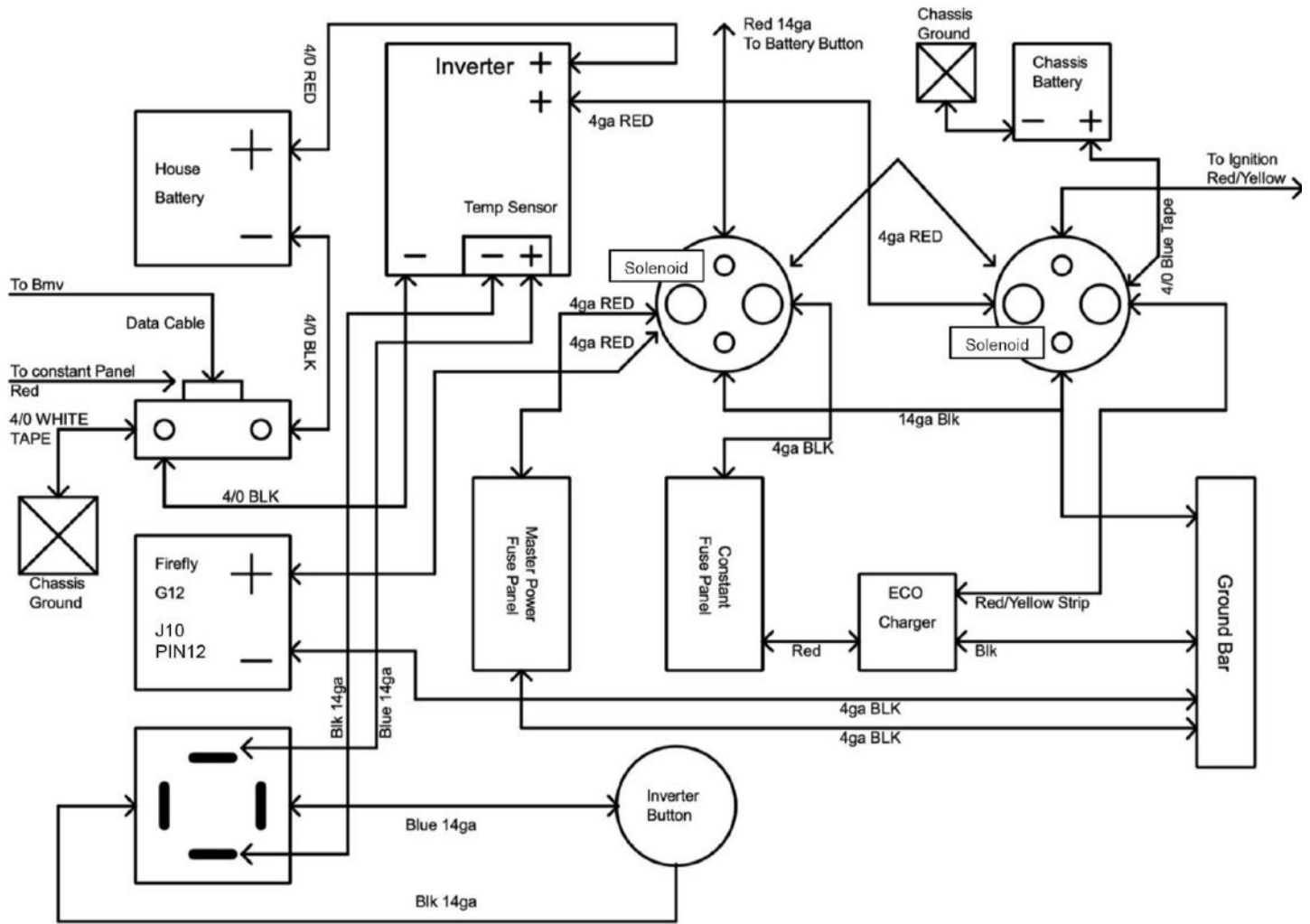


120 VOLT SYSTEM

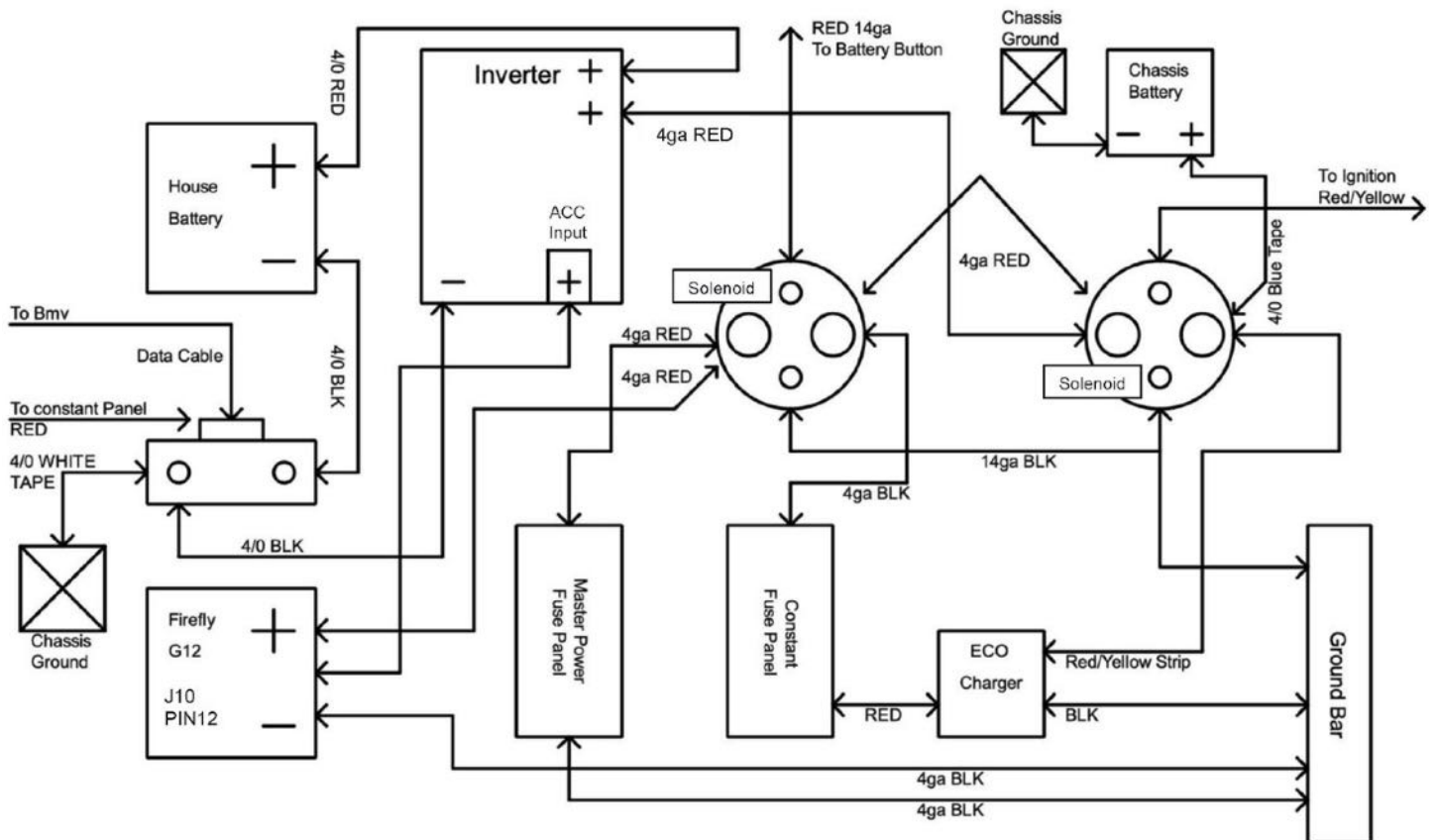


LITHIUM UNIT 120 VOLT



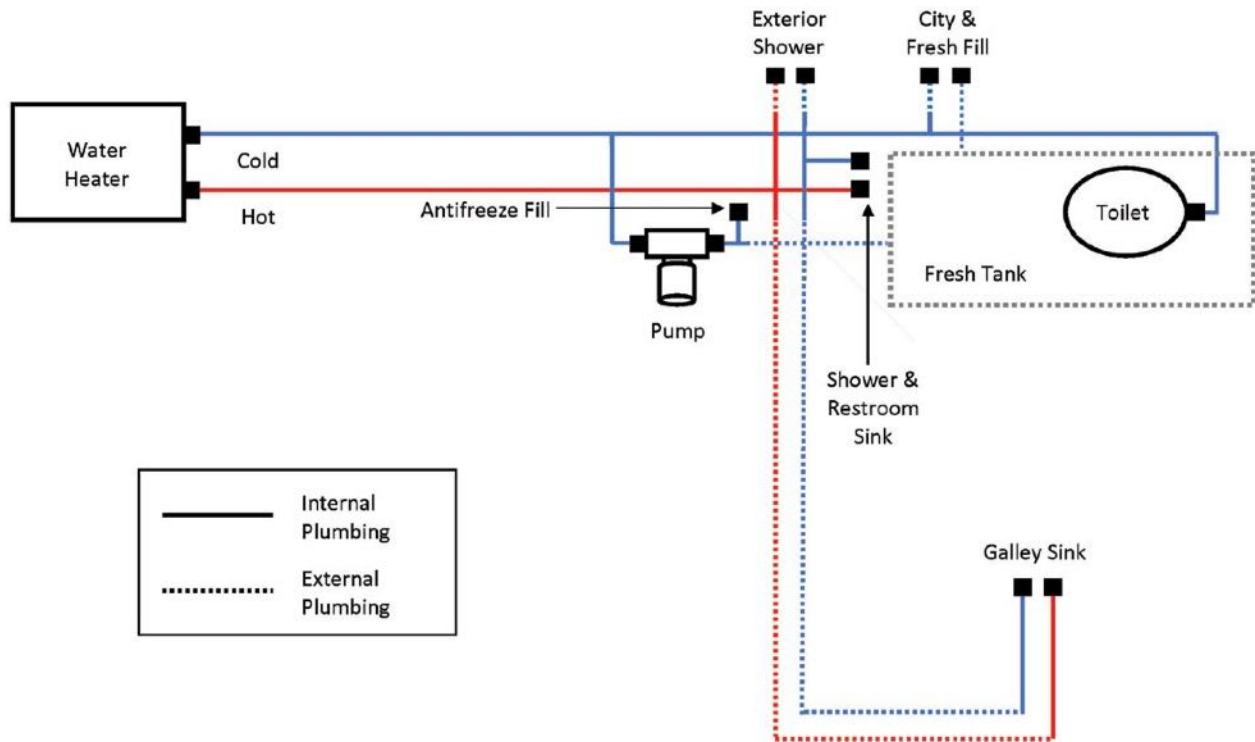


VICTRON 12 VOLT



XANTREX 12 VOLT

■ Plumbing



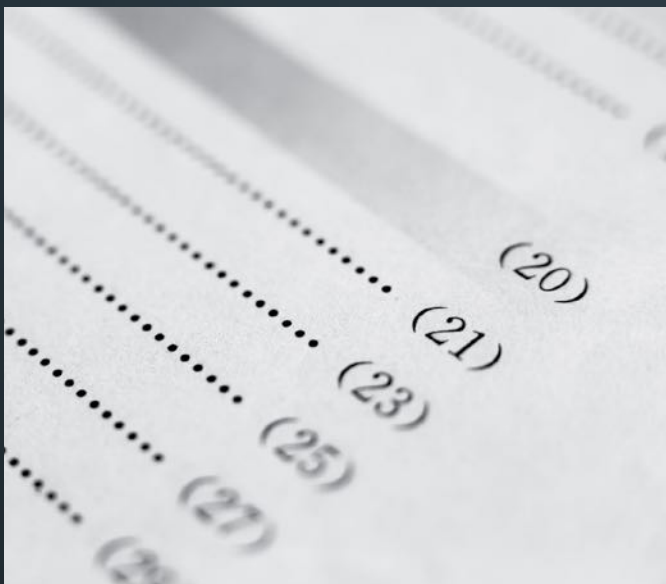
FRESH WATER SYSTEM





SECTION 15

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