

1.0 COACH EXTERIOR . . .

Fiberglass Skins

Born Free Motorcoach constantly tests and evaluates new fiberglass materials in order to offer you, the owner, the finest and most long lasting product available. Even though the best possible materials are used to produce your motorcoach, without proper care the fiberglass finish may become dull, faded, or chalky. The following provides you with a brief explanation regarding the causes of a dull or faded fiberglass finish and what can be done to restore the finish.

Fiberglass consists of two basic polyester products – gel coat and a structural reinforcement. Gel coat is the outer, colored surface and the structural reinforcement is a blend of polyester laminating resin mixed with strands of glass. Together, they create a structure that is strong, weather resistant, and long-wearing.

All materials, when exposed to the elements, slowly deteriorate. Although the gel coated surface of a Born Free Motorcoach is approximately ten times thicker than the painted surface of an automobile, it too will deteriorate when exposed to the elements.

General Maintenance

- (1) Wash monthly, or, more frequently if needed. Wash with a mild soap, such as dishwashing soap; avoid using strong alkaline cleaners and abrasives.
- (2) Waxes (particularly carbauba waxes) have been a long standing favorite fiberglass protection method. Recently, however, the chemical industry has developed better products for sealing the gel coated fiberglass surfaces. These new polymer based products aren't just a coating that resides on the surface like waxes, they actually get into the pores of the gel coat and seal the surface from oxidation and other damaging elements.

There are many polymer based sealers available to protect your unit. When choosing a sealer, carefully read the label of the product to make sure it contains polymers that are designed to be used on gel coats or fiberglass, and to determine

how frequently the sealer should be applied. For coaches that have had waxes previously applied, wax removers are available for use before applying the sealant.

Chalking

Chalk is created when the outer surface of the gel coat breaks down into an extremely fine powder. The chalk that develops is strictly on the surface, and is caused by overexposure to the sun's ultraviolet rays, chemicals in the air, and/or improper care of the gel coat surface. To alleviate chalking, wash the motorcoach and apply a sealant to restore its luster. If this is not effective, apply a fine rubbing compound, either by hand or with a power buffer, and then apply a good sealant. If chalking is still present, a light sanding using 600 grit (or finer) wet or dry sandpaper can be used followed by fine rubbing compound and a coat of sealant.

NOTE: If a power buffer is used, use low RPM with light pressure. Keep the buffer moving at all times to prevent heat build-up, which may result in softening of the gel coat surface.

Fading

Fading means the color has changed, and is caused by (1) chalking, which makes the color light, (2) pigments in the gel coat changing color due to a reaction with chemicals or pollutants in the air, or (3) the gel coat being bleached or stained. Stains may derive from dirt, dust, road tar, plant sap, rust, or materials from caulking or sealing compounds.

To determine the best way to remove a stain, pre-test the stain in an inconspicuous area first using a mild detergent. A mild abrasive cleaner may be used if necessary, although it may leave a dull finish which will require buffing in order to restore luster. Always apply a coat of sealant to the repaired area when completed.

To remove a non-soluble stain, you may try using acetone, paint thinner, or alcohol using care to prevent prolonged contact in order to minimize the risk of deterioration of the gel coat surface.

Repairs

Born Free Motorcoach will be happy to assist you

with any repair you may require. Scratches, chips, cracking, etc. on your Ford chassis may be touched up using touch-up paint purchased from your Ford dealer. The fiberglass gel coat is the same color as the Ford chassis. For a large repair, you may contact Born Free Customer Support; we will send you the appropriate gel coat material.

Doors and Locks

Born Free Motorcoaches are equipped with the following locks and keys:

- (1) Chassis door and ignition.
- (2) Coach entrance door lock.
- (3) Coach entrance dead bolt lock.
- (4) Compartment door locks (Barrel Keys).

For a replacement, see chassis dealer, call Trimark (for entrance door replacement keys), or call Born Free Motorcoach (for replacement barrel keys).

Ladder and Rack

An exterior, roof mount ladder and rack provide access to the roof area for storage purposes and routine maintenance. Care should be taken when using the ladder in icy or rainy conditions. Do not exceed 100 pounds per square foot or 1,000 pounds total weight of storage on the roof.

Roof Mounted Storage Compartment (OPTIONAL)

A weatherproof storage pod is a very useful accessory for storing large items such as suitcases and sleeping bags. Do not exceed 10 pounds per square foot or 100 pounds total weight of storage in the compartment.

Sewer Hose Compartment

The storage compartment for your sewer hose (Figure 1.1) is a tube located on the driver's side between the rear skin and the bumper.

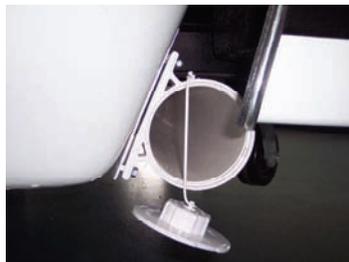


Figure 1.1

Engine Fuel Door

To access your fuel tank fill, open the fuel door (Figure 1.2) located on the driver side of the coach.

Pay particular attention to the warning labels affixed to the door. Diesel owners—remember to use diesel fuel rather than gasoline.



Figure 1.2

WARNING: For your safety, all gas appliances must be turned off when refueling the vehicle.

Power Cord Hatch

A 25-foot power cord is stored in the bumper compartment. (Figure 1.3)



Figure 1.3

Waterfill Access Compartment

An access door, located on the driver's side, approximately two thirds back (Figure 1.4), contains hookups for the: (A) Potable Water, (B) City Water Fill, (C) Outside Shower, (D) Outside Cable Connection, (E) Phone Jack, and (F) Exterior Light. The light is a useful aid while evacuating waste tanks at night.



Figure 1.4

120-Volt Exterior Outlet

A 120-volt weatherproof outlet, located on the passenger side of the motorcoach, (Figure 1.5) is available to operate 120-volt accessories. This outlet is controlled



Figure 1.5

by a 120-volt ground fault-breaker (located in the converter) to prevent electrical shock caused by wet conditions. Use only grounded plugs and do not exceed the amperage limit of the breaker.

Furnace Outlet

The exterior furnace outlet (Figure 1.6) is a combination intake / exhaust system. When the furnace is operating, this vent may become hot.



Figure 1.6

WARNING: Do not touch or place combustible materials near the furnace outlet.

Roof Mounted TV Antenna

A. TV Antenna

Models with TV's have a Winegard Sensor Antenna (Figure 1.7) mounted on the roof, with controls inside the coach for adjustment. To operate the antenna first extend it by rotating the elevating crank clockwise. Once it has been fully extended, pull the directional handle away from the ceiling (to disengage it from the ceiling plate); rotate the antenna for optimal reception. To retract the antenna before travel, first rotate it so the pointer on the directional handle aligns with the pointer on the ceiling plate. Then, turn the elevating crank counter clockwise until resistance is felt.



Figure 1.7

WARNING: Before driving, make sure your antenna has been completely retracted.

B. Signal Amplifier

All coaches with TV antennas are also equipped with signal amplifiers. Amplifier wall plates are usually located near the TV (Figure 1.8). To activate the signal amplifiers and improve your TV antenna reception, push the button on the amplifier wall plate. A green light indicates amplified antenna reception.

Because the amplifier will interfere with cable and satellite signals, the button should be in the off



Figure 1.8

position when receiving a signal from a cable hookup or from a satellite.

C. Cable Connection

Some campgrounds offer cable TV. To use this service, simply connect a TV cable wire from the connection point provided by the campground to the connection point found inside the Water Fill Access door (Figure 1.4 — “D”) of the motorcoach.

Note: When cable TV is in use, Signal Amplifier Button (Figure 1.8) must be in the off position to alleviate interference with cable reception.

Entrance Door Light and Grab Handle

The exterior porch light, lighted grab handle and stepwell light are controlled by switches located inside the entry door on the wall.

2.0 COACH INTERIOR . . .

Seat Belts

For seat belt requirements, refer to RVIA (Recreational Vehicle Industry Association) and FMVSS (Federal Motor Vehicle Safety Standards). Most states, by law, require the use of seat belts. Born Free Motorcoach recommends all passengers use seat belts while the vehicle is in motion. (The motorcoach has seatbelts on its chairs only — sofas and dinettes do not have seatbelts attached.)

According to Federal Regulations for recreational vehicles, an automatic restraint diagonal shoulder belt on the right front passenger seat is not approved (and therefore cannot be used) to secure a child safety seat.

Smoke Detector

A smoke detector (Figure 2.1) has been provided for your protection. The detector operates on a 9-volt battery. You should test the detector before each trip, and weekly while your motorcoach is in use.

Refer to the Smoke and Fire Users Guide for



Figure 2.1

operating instructions, proper testing procedures, and the recommended frequency for battery replacement.

LIMITATION ON LIABILITY – Warranty on the smoke detector is limited to the manufacturer’s warranty. Born Free Motorcoach is not liable for any loss or damage which may occur, either directly or indirectly, due to the failure of the detector.

Some states do not allow the exclusion or limitation of incidental or consequential damages; the above limitations or exclusions may not apply to you. The warranty provides you with specific legal rights; you may also have other rights, which will vary from state to state.

Cabinets and Doors

The cabinets in a Born Free Motorcoach are made of solid oak or cherry. Normal movement of the motorcoach and/or loading / unloading the cabinets may cause their doors to become misaligned. A simple adjustment of the door striker or hinge is all that is normally required.

Beds

Born Free Motorcoach uses several types of beds, depending on the floor plan selected. These beds are designed for maximum comfort in both seating and sleeping.

1. **42” x 76” Sofa Bed** – The sofa quickly converts to a 42” x 76” bed. Simply lift up the front edge of the seat cushion and pull out. To convert the bed back to a sofa, lift the front edge and push in.
2. **Dinette / Sofa Bed** – The optional dinette sofa combines sleeping accommodations with dining style seating. After stowing the table and unfolding the center support, move the cushions into place — use one of the backrest cushions to form the bed. Open storage is located under each seat base.
3. **Cabover Bed** – This uniquely shaped mattress fits the contour of the cabover bed area. By “flipping over” the center cushion, you are ready to climb the bed ladder to the cabover bedroom. Privacy curtains separate this area from the rest of the motorcoach and the outside. At its widest points, the mattress

measures 66” x 82” x 4” thick.

4. **Rear Side Bed** – Rear Side Bed Models have under-bed storage. To gain access to this space, open the door at the base of the bed, the outside compartment door, or lift the mattress and remove the access panel.

Carbon Monoxide Detector

The C/O Detector (Figure 2.2) is designed to detect high levels of carbon monoxide in your motorcoach. The alarm operates on a 9-Volt battery. For your protection, we recommend you test the alarm before each trip and weekly while your motorcoach is in use. Refer to the Costar Owners Manual for operating instructions, proper testing procedures, and the recommended frequency for battery replacement.



Figure 2.2

LIMITATION ON LIABILITY – Warranty on the carbon monoxide detector is limited to the manufacturer’s warranty. Born Free Motorcoach is not liable for any loss or damage which may occur, either directly or indirectly, due to the failure of the detector.

Some states do not allow the exclusion or limitation of incidental or consequential damages; the above limitations or exclusions may not apply to you. The warranty provides you with specific legal rights; you may also have other rights, which will vary from state to state.

Emergency Exits

The two (chassis) cab doors and the motorcoach’s entrance door are designated exits. Additionally, the rear window on some motorcoach’s has also been designated as an emergency exit. If a window has been designated as an emergency exit, it will have a red latch. All occupants should be familiar with these exits in case of an emergency.

Roof Vents

To provide adequate ventilation inside your motorcoach, roof vents have been installed in the ceiling.

A. Bathroom Vent

The bathroom vent (Figure 2.3) is located in the shower or the bathroom to ventilate the bathroom area. The cover must be open before the fan is turned on, and the fan must be turned off before the handle is pulled down to close the vent. Push the handle up to open the cover and pull down to close. The cover should be in the closed position when not in use.



Figure 2.3

B. Fan-Tastic Vent

The Fan-Tastic vent (Figure 2.4) is located in the roof area near the front of the unit. Refer to the Fan-Tastic Vent operating instructions for proper use. Do not travel with the roof vents in the wide-open position and make sure all roof vents are closed to ensure maximum efficiency when using the air conditioner.



Figure 2.4

Roof Air Conditioner

A 13,500 BTU Duo-Therm roof mounted air conditioner is installed as an option. Most motorcoaches use controls located on the air conditioner unit, however, some models are equipped with a Comfort Control Center (Figure 2.5) which is mounted on the wall. The Comfort Control Center controls the air conditioner as well as the furnace. Refer to the Comfort Control Manual for operating instructions. The instructions shown below are for controls located on the air conditioner unit.



Figure 2.5

- **Controls** – The selector switch (Figure 2.6) is located on the left side of the air conditioner control panel. It has eight positions and controls fan speeds, and heating and cooling modes. When in the cooling mode, the compressor will cycle on and off depending on

the thermostat setting. The thermostat is located on the right side and controls the temperature range from 65 degrees to 90 degrees.



Figure 2.6

- **Operating Instructions** – The roof mounted air conditioner operates on 120-volt power supplied by either shoreline or generator produced 120-volt current. The AC / Heat Strip must be in the OFF position when the generator is started or when the shoreline power cord is plugged in.
- **Cooling Operation** – Select the fan speed to best satisfy your needs:
 - **High Cool** – Select when maximum cooling and dehumidification is required.
 - **Medium Cool** – Select when normal or average cooling is required.
 - **Low Cool** – Select to maintain comfort — typically used when the room is already at the desired comfort level. This speed is normally used for nighttime operation.

NOTE: *When in the cool mode, the blower runs continuously to circulate air and maintain an even temperature. In order to maintain the selected temperature level, the compressor will cycle on as cooling is required.*

- **Heating Operation** – Turn the selector switch to Opt. Heat. The fan and heater will run as required. The heat strip takes a few minutes to warm up, but, if left on, does an adequate job of heating when small amounts of heat are required in the motorcoach. The heat strip should not be used as the main source of heat for your motorcoach – the furnace should be used in colder conditions. Do not leave the heat strip on when the vehicle is unattended.
- **Maintenance** – Periodically remove the filter/grille assemblies located in the inside air box and clean them. To remove the filter/grille

assemblies (Figure 2.7) place thumbs and forefingers on the release tabs, squeeze the tabs

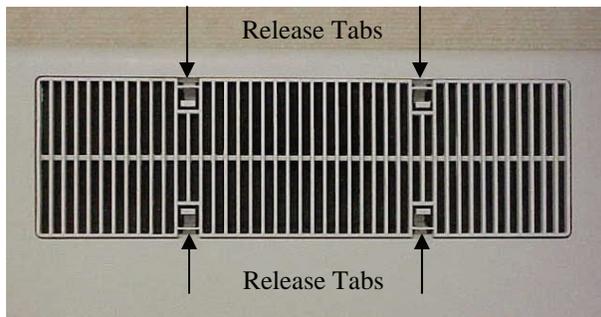


Figure 2.7

inward, toward the center of the grill, and pull one side down. After the assemblies are removed, wash the filter/grille assemblies with soap and warm water. Let the assemblies dry before reinstalling them.

- **Trouble Shooting** – If the unit fails to operate, first check the power source (the shoreline power cord or the generator) to ensure it is generating a proper amount of current. Next, check the breaker in the power converter to see if it has been tripped. Refer to the Duo-Therm Air Conditioner manual for warranty and service information.

Range Hood / Water Pump Switch / Monitor Panel

- **Range Hood** – Born Free Motorcoaches are equipped with a 12-volt range hood (Figure 2.8).



Figure 2.8

The range hood has a built-in monitor panel which accurately reads the levels of the holding tanks, water tank, and battery. It also has switches for the hood light, fan, and water pump. The range hood may be cleaned with soap and water. The aluminum filter should be periodically removed and washed in soap and water, allowed to dry, and then reinstalled.

- **Water Pump** – The water pump switch (Figure 2.9) will activate the water pump. The pump may be left on while camping; it will automatically cycle when water is needed. Born Free Motorcoach recommends turning the



Figure 2.9

water pump switch off when traveling or when leaving the motorcoach. In the event of a leak in the water system, turning the pump switch off may reduce damage to the motorcoach.

Monitor Panel – Pressing and holding the “monitor” switch, will light up the panel (Figure 2.10) showing fluid levels in the black waste holding tank, the gray water holding

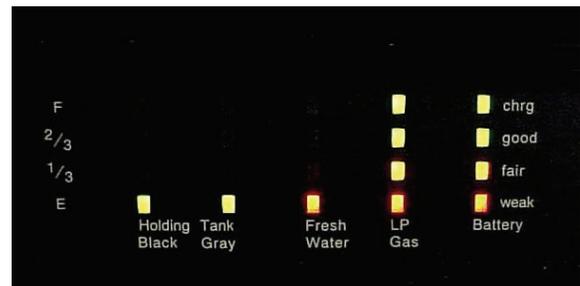


Figure 2.10

tank, the fresh water holding tank, and the charge condition of the auxiliary battery.

Microwave Oven

Born Free Motorcoach offers various brands of microwave ovens; consult the manufacturer’s owner’s manual in this packet for proper operating instructions and warranty service information.

TV/DVD

Born Free offers various brands of TV’s; consult the manufacturer’s owner’s manual in this packet for proper operating instructions and warranty service information.

Interior Maintenance

Carpet, upholstery, curtains and shades should be vacuumed regularly. If the curtains need to be cleaned, they should be dry cleaned. Carpet spot remover may be used to remove stains and soiled spots from furniture and carpet. Always read and

follow the instructions of any cleaning product.

3.0 ELECTRICAL SYSTEMS ...

12-Volt Automotive Electrical System

The chassis batteries provide power to the following:

- (1) Headlamps
- (2) Turn Indicators
- (3) Console Panel Lamps
- (4) Windshield Wipers
- (5) Speed Control
- (6) Starter Motor
- (7) Backup Lights
- (8) Exterior Clearance Lights
- (9) Tail Lights, Indicator Lights, and Stop Lights
- (10) Cigarette Lighter (Dash Mount)
- (11) Auto Air Conditioner
- (12) Dash AM/FM Radio/CD
- (13) Lumbar—Driver and Passenger
- (14) Driver Chair Controls

The above accessories are fused at the chassis fuse box or auxiliary fuse block. Refer to your chassis owner's manual for location of the batteries and fuse boxes and for proper fuse replacement.

NEVER install a larger rated fuse as a replacement; severe wire damage or possible fire may result. An additional fuse block (Figure 3.1) has been added for the side mirrors, driver seat and passenger seat lumbar, compass mirror, and electric entrance step (22' models only). It is located under the dash by the brake pedal.



Figure 3.1

Note: The chassis batteries are sealed and do not require maintenance.

12-Volt Auxiliary Coach System

Each Born Free Motorcoach is equipped with two, deep-cycle, auxiliary batteries. These batteries are mounted on a slide-out tray beneath the coach floor, on the driver's side. Auxiliary batteries for diesel units are located underneath the Motorcoach, behind the passenger side running board.

The auxiliary batteries operate the following:

- (1) Interior Lights
- (2) Interior Roof Fans
- (3) Range Exhaust Fan
- (4) Furnace Fan and Igniter
- (5) Water Pump
- (6) Monitor Panel
- (7) Auxiliary Generator Starter
- (8) LP Leak Detector
- (9) Igniters for Refrigerator and Water Heater
- (10) 17" TV / DVD
- (11) Isolator Relay

An isolator relay (Figure 3.2) separates the chassis' electrical system from the motorcoach's electrical system, which allows the motorcoach's auxiliary system to be used without affecting the charge of the chassis battery. When the chassis engine is running, the isolator relay allows the alternator to charge both the chassis battery and the auxiliary battery. When the motorcoach is plugged in to 120-volt shoreline power, or, when the auxiliary generator is running, a small charge is generated through the power converter to the auxiliary batteries. The rate of this charge, however, is a great deal less and will take longer to recharge.



Figure 3.2

Note: The power converter does not charge the chassis battery when the motorcoach is plugged in to the 120-volt shoreline power cord or when the auxiliary generator is in use.

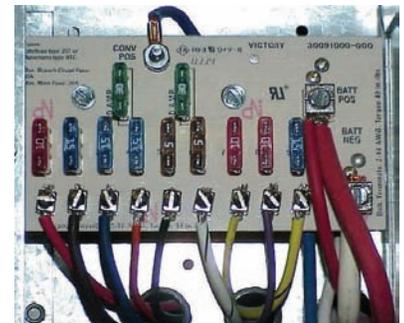


Figure 3.3

12-Volt Fusing

12-volt fuses are located inside the converter (Figure 3.3) on an auxiliary fuse panel (Figure 3.4) and sometimes



Figure 3.4

inline. Refer to the 12 V/DC House Battery Circuits drawing (included in this packet) for the location of the auxiliary fuse panel. **DO NOT** install a larger replacement fuse, as each circuit is rated for the size of the fuse installed.

110-Volt System

Operated from a shoreline utility service, or an auxiliary generator source, the following equipment runs only off 110-volt power:



Figure 3.5

- (1) Roof Air Conditioner / Heater
- (2) Refrigerator (except when operating on LP Gas)
- (3) Electric Appliances
- (4) Electrical Outlets
- (5) Microwave
- (6) 23" TV / DVD
- (7) Water Heater (except when operating on LP Gas)

110-volt circuit breakers are located inside the converter (Figure 3.5).

110-Volt Utility Supply

A 25-foot, UL approved, 30-amp, heavy-duty cable (Figure 3.6) is provided for connection to a utility supply; a 15-amp adapter is provided to adapt to a standard three-prong outlet.



Figure 3.6

Note: When using a 15-amp adapter, operating the air conditioner and too many other appliances may cause a circuit overload. Never use an ungrounded plug adapter; an electrical short may occur and cause serious electrical damage or personal injury. If the motorcoach is connected to a utility supply for long periods of time, it is important to check the water level of the batteries every week; add water if necessary.

Motorcoach Battery Care

Check the battery water level before every trip and at least once a week during heavy use. The terminals on the battery must be kept clean and free from corrosion. Even when the motorcoach is idle, the batteries will discharge due to chemical action. Periodically drive the motorcoach, run the generator, or plug the motorcoach in using the shoreline power cord in order to replenish some of the lost battery charge. Do not connect the battery to a portable battery charger and leave it for the winter; overcharging may occur and it may result in the batteries overheating and creating a fire hazard.

Battery Storage Compartment

Each motorcoach is manufactured with an auxiliary battery storage compartment (Figure 3.7), located under the floor on the driver's side of the motorcoach, near the generator. Two batteries are mounted on a sliding tray; the tray can be extended when needed. This compartment is not weather-tight – fumes and gasses must be allowed to escape.



Figure 3.7

Battery Disconnect

If the motorcoach is stored for the winter, turn the battery disconnect switch (Figure 3.8) to the “off” position. (The battery disconnect switch is located near the entrance stepwell for 24', 26', and 32' models and near the rear door on 22' models.)



Figure 3.8

Converter Control Center – Battery Charger

When using the 120-volt shoreline power or the generator, current enters the motorcoach and is carried directly into the converter control center (Figure 3.9). The converter converts the 120-volt power to 12-volt DC current and also supplies 120-

volt power to the wall outlets and to the appliances requiring AC current. The converter also contains a battery charger which will charge the auxiliary battery at a rate of three (3)amps per hour.

The 3-amp charger is not intended to charge the auxiliary battery rapidly. Rather, the alternator of the chassis is intended to be the primary source of charge. When plugged into shoreline power, DC power is not drawn from the auxiliary battery.



Figure 3.9

Most electrical circuits are switched and fused inside the converter control center. Opening the front panel of the converter will expose the circuit breakers controlling the 120-volt power in the motorcoach and the automotive type snap-in fuses controlling the 12-volt circuits. The circuit breakers are a manual reset type, similar to those used in your home. If a short occurs, the breaker will trip and will need to be manually reset. The automotive fuses must be replaced using the same amperage rated fuses. We recommend you carry a supply of spare fuses in the various sizes required. The circuits are identified inside the converter face panel.

In the event a circuit breaker trips or a fuse blows, reset the breaker or replace the fuse. If this happens again, we suggest you locate the circuit and unplug the offending appliance before resetting the breaker or replacing another fuse. The appliance may be causing the breaker to trip or the fuse to blow. Never replace a blown fuse or circuit breaker with a larger rated fuse or breaker.

Ground Fault Circuit Breaker

For your protection and safety, we have installed a Ground Fault Circuit Breaker (GFCB) (Figure 3.10) in the converter to protect the outlets in your Born Free Motorcoach. The outlets requiring protection are those located in areas with potential exposure to moisture. All 110-volt outlets are protected by this device and will trip the “GFCB” breaker if moisture is sensed. You should test the “GFCB” once a month to ensure the breaker is functioning properly. To test the device, simply

push the “TEST” button (A). The breaker handle will audibly move to the center trip position, indicating ground fault protection. Reset the breaker by moving the handle to “OFF” and then to “ON”. If the test fails to trip the breaker, the breaker should be replaced.



Figure 3.10

Automatic Load Shed Device

An automatic load shed device (Figure 3.11) has been installed in your unit near the converter to prevent system overload when the microwave and the 110 Volt water heater are in use at the same time. The automatic load shed device will temporarily disconnect the water heater while the microwave is being used. The water heater will be automatically re-activated when use of the microwave is complete.



Figure 3.11

120-Volt Auxiliary Generator

The auxiliary generator (Figure 3.12), located under the floor on the driver’s side of the vehicle, allows you to use 120-volt appliances when 110-volt shoreline power is unavailable. Gas generators operate on unleaded gasoline drawn directly from the fuel tank of the Motorcoach; LP generators operate on LP gas from the motorcoach’s LP storage tank. In order for a gas generator to operate, the fuel tank must be at least one-fourth full; the level of the LP tank must be at least 15% full.



Figure 3.12

WARNING: The exhaust from a gas generator contains carbon monoxide (CO). This gas is colorless, odorless, tasteless, lighter than air, and

poisonous. The exhaust system of your auxiliary generator has been installed with your safety in mind, however, certain precautions must be taken to protect you from conditions beyond the control of the manufacturer.

- Do not simultaneously operate your generator and a roof vent set on intake. Doing so could draw air containing exhaust gases into the vehicle.
- Do not open windows or non-powered vents in the vicinity of the generator location.
- When parking your Motorcoach, position it so the wind will carry exhaust fumes away from the motorcoach. You should also note the position of other vehicles parked near you.
- Do not position the Motorcoach in such a way that the generator exhaust will be deflected off vegetation, snow, buildings, vehicles, or any other object. Doing so may deflect the exhaust under or into the vehicle.

The auxiliary generator can be started by a switch on the generator or by a Remote Mounted Start/Stop Panel (Figure 3.13) located inside the coach.

Refer to the Owner's Manual and Installation Instructions and Remote Mounted Start/Stop Panel With Fuel Prime and Hourmeter for



Figure 3.13

Operation, Maintenance, Troubleshooting, and Service and Warranty information.

4.0 LP GAS SYSTEMS . . .

LP Tank

Your motorcoach uses liquid petroleum gas (LP / Propane) as a fuel for the appliances requiring heat (eg, water heater, furnace, range, and absorption-type refrigerator). LP gas is economical and effective for these purposes; when proper precautions are taken, it is a safe form of energy. The LP tank (Figure 4.1) is located under the floor on the passenger side of the motorcoach. Dependent on your model, it may be located at the front, or, it may be toward the rear. Refer to the brochure included in this packet for basic

information and safety practices.

WARNING:
For your safety, all gas appliances must be turned off when refueling the vehicle.



Figure 4.1

LP Gas Detector

A standard feature in all Born Free Motorcoaches is the LP Gas Detector (Figure 4.2). It is designed to **quickly detect** leakage in any LP gas piping and appliance system — **not to prevent** leaks. A green light indicates the detector is operating properly. If an abnormal amount of LP is detected in your coach, a red light will come on and you will hear the sound of a pulsating alarm. Should the alarm sound, refer to the Operating Instructions for 'Propane Gas Leak Detector' for the correct course of action. The alarm is also equipped with a low voltage indicator. An orange light will appear and the alarm will beep if the motorcoach's house batteries are low. Starting the engine should charge the auxiliary batteries; the orange light should then go off. If the orange light stays lit, there may be a problem with the house batteries. If the detector does not seem to be properly operating, it should be examined by an RV dealer or the manufacturer should be contacted.



Figure 4.2

NOTE: *Aerosol spray (hair spray, Pam Cooking Spray, cleaners, etc) in the area of the detector may set the alarm off.*

LIMITATION ON LIABILITY – Warranty on the LP detector is limited to the manufacturer's warranty. Born Free Motorcoach is not liable for any loss or damage which may occur, either directly or indirectly, due to the failure of the detector.

Some states do not allow the exclusion or limitation of incidental or consequential damages; the above limitations or exclusions may not apply to you. The warranty provides you with specific legal rights; you may also have other rights, which will vary from state to state.

We encourage you to test the detector before and after each trip. For proper testing procedures, refer to your product manual. The LP Gas system should also be periodically checked for leaks. LP gas is mixed with an oily substance having a pungent odor; if there is a leak, this distinct odor will be present in the air.

The best method to test for leaks is to use a soap solution made with water and ordinary dishwashing detergent. Apply the solution with a small paintbrush (or a sponge) to the gas lines and connections. Bubbles will appear if gas is leaking out of the system. Most leaks occur at fittings and can be usually be corrected by tightening the fitting. Where tightening fails to stop the leak, the fitting must be replaced.

WARNING: *Flammable materials should never be used to check for leaks in an LP Gas system.*

Occasionally, water may find its way into the LP Gas system. If this water subsequently freezes, operation of the system may fail. Adding anhydrous methanol to the LP gas system will usually eliminate this problem. The anhydrous methanol will absorb the water and carry it out of the system as the gas is used. If possible, find a service station that adds methanol to their propane during the winter months.

Note: *Adding anhydrous methanol to your LP tank should only be performed by a certified technician.*

Most of the gas appliances in the Born Free Motorcoach have electronic pilot lights, which lights the fuel upon demand. In addition, these appliances have a device built in to shut off the flow of gas to the burner if the burner does not ignite.

Furnace

The furnace in the Born Free Motorcoach is an LP

gas burning model and is controlled by a wall thermostat. Most motorcoaches are equipped with a wall thermostat, which controls the furnace only (Figure 4.3) . In some motorcoaches, the thermostat



Figure 4.3



Figure 4.4

controls both the furnace and the air conditioner (Figure 4.4) . Refer to the product manual for proper maintenance and operation. The furnace should not be used when the vehicle is in motion.

Warning: *Do not alter the vent assembly supplied with the furnace; modifications could affect its operation.*

Water Heater

A six gallon water heater (Figure 4.5) is standard in every Born Free Motorcoach.

Note: *The water heater must be filled with water before its pilot light is lit. Refer to the section titled “Summer De-Winterizing” to ensure all valves have been turned in the proper direction for water heater use.*



Figure 4.5

To fill the water heater, turn the water pump switch on and open a hot water faucet.

The water pump will push water into the water heater tank, and air from the water heater will escape through the open hot water faucet. A steady flow of water from the open hot water faucet indicates the tank is full; the faucet should be shut off. The best time to fill the water heater is when you are filling the fresh water tank.

Lighting Your Water Heater

Water in the water heater can be heated by using either 110-volt power, or LP Gas and 12-volt power.

Warning: *To prevent damage to the water heater, you must have water in the heater. The heating system will activate even when there is no water in the heater. Failure to fill the water heater before activating the system may result in damage to the heating element.*

To use 110-volt power:

The switch for the 110-volt heating element (Figure 4.6) is similar to that of a home wall switch but it has a red toggle. Move the switch toggle to the “ON” position. (A light in the red switch toggle will light up to identify that the switch is on; it will remain lit until the switch is turned off.) When the water reaches the maximum manufactured preset temperature, the heater will turn off. The internal non-adjustable thermostat will cause the water heater to cycle on and off to maintain the desired temperature of the water.



Figure 4.6

To use LP gas and 12-volt power:

The switch for the LP gas heating element (Figure 4.7) has a toggle and a separate red lens that will light up.

- (1) Turn on the gas supply at the LP gas tank.
- (2) Push the gas water heater ignition switch to the “ON” position. The red lens on the switch will light up while the water heater burner attempts to ignite. When the red lens light on the switch shuts off, the water heater has been properly ignited. As with 110-volt power, the internal non-adjustable thermostat will cause the water heater to cycle on and off to maintain the



Figure 4.7

desired temperature of the water.

- (3) If the igniter fails to light, the red lens on the switch will remain lit. For other operation, maintenance, and warranty and service information, or, if the unit fails to light, refer to the Gas Water Heater Installation and Operation Manual.

Refrigerator

Born Free Motorcoaches are equipped with an LP Gas and 120-volt AC refrigerator. The refrigerator should be started at least one day before leaving on any trip or outing. Pre-chill all food and beverages in your home’s refrigerator before placing them in your motorcoach’s refrigerator. This will allow the refrigerator to cool in a more efficient manner, and, it will not raise the temperature by suddenly placing too great a load on it. An inexpensive refrigerator thermometer can be purchased and will prove valuable in monitoring the refrigerator’s temperature.

Both the motorcoach and the refrigerator must be level in order for the refrigerator to properly operate. Refer to the Refrigerator Installation and Operating Instructions for proper operation, maintenance, warranty and service.

Range and Oven

To operate the range and/or oven, simply turn on the LP Gas at the tank. Once the gas at the tank has been turned on, simply turn on the gas control to the desired burner and light the burner with a match or igniter.

If you are using an LP gas range for the first time, you will notice the flame’s height is appreciably lower than that of a natural gas burner. LP gas contains more BTU per unit than natural gas; a lower flame cooks just as quickly and contains just as much heat as the larger, natural gas flame.

The LP gas flame in your Born Free Motorcoach should always be blue in color — no yellow tips. Yellow tips will smoke and/or cover the bottoms of your cookware with soot. Refer to your range manual for proper operation, maintenance, and warranty and service information.

WARNING: *The range is not a substitute for your furnace and must never be used to heat the*

motorcoach.

LP Gas Systems Maintenance

LP gas systems normally operate for long periods of time with minimum maintenance. However, a few tips on maintenance may be helpful. One of the worst enemies of LP gas systems is the spider. Spiders are attracted to tunnels and holes and frequently spin webs across and through the orifices of gas fed appliances. The webs restrict airflow and produce a weak, yellow flame which typically deposits carbon. If a yellow flame is present, all parts of the burner should be wiped clean and the orifices should be blown clear with compressed air. If spider webs are not present and the flame is still too yellow, the air adjustment of the burner needs to be altered (until the flame is only blue in color). Refer to the affected appliance's operating instructions for more information, or, have a qualified technician make the appropriate adjustments.

5.0 PLUMBING SYSTEMS . . .

Fresh Water System

Fresh water can be supplied to the motorcoach from two sources (1) The water tank located inside the motorcoach or, (2) through a garden hose connected to the water intake at one end and to a campground water source at the other end. The fresh water tank system is equipped with a demand pump (Figure 5.1) which controls water pressure by use of a switch built into the pump. When a faucet is opened (turned on), pressure in the water lines drops and the pump turns on. When the faucet is closed, pressure quickly builds up, and the pressure switch shuts the pump off. The manual switch, located on the range vent, is used to turn the electrical power to the demand pump off. The pump operates on 12-volt power.



Figure 5.1

NOTE: *It is good practice to turn the pump switch off when leaving the coach for a period of time and when retiring for the night. This will reduce damage to the motorcoach in the event of the*

development of a leak in the water system. If the pump cycles on and off and water isn't being used in the motorcoach, shut the pump off and check the system for leaks.

Fresh Water Tank

The fresh water tank fill (Figure 5.2) is located outside the motorcoach on the driver's side, behind the water fill access compartment door (Figure 1.4 "A"). A garden hose can be used to fill the fresh water tank.



Figure 5.2

Allowing the water to run into the tank at a moderately slow speed will allow air to escape — the tank will fill much easier.

Remember to fill the water heater when filling the fresh water tank. Never leave the coach unattended while filling the water tank. Overfilling of the tank can cause it to bulge, which, in some instances, can cause cabinet damage. Remove the hose as soon as the tank is full.

City Water Connection

A City Water Connection (Figure 5.3) has been provided on the outside of the motorcoach (refer to the Waterfill Access Compartment—Figure 1.4 "B"). This connection is to be used when the motorcoach is parked in a campground that has hookup facilities for "city water".

To use, turn off the demand pump and connect a water hose to this fitting. The city water pressure will provide adequate water flow. The city water connection will bypass the fresh water system and will not fill the fresh water tank. Some water systems have very high water pressure; to guard against damage to pressure-limiting components, it would be wise to use a standard pressure reducer in your hose line.



Figure 5.3

Toilet

To flush the toilet, press the pedal down completely. To add water to the bowl, press the pedal to a horizontal position. Release when sufficient water is in the bowl. On some models, an optional hand sprayer is included. To use, simply press the sprayer thumb lever while stepping on the flush pedal. Other models have a hand flush rather than a foot flush. To operate a hand flush, pull the lever on the rear, right side toward you. Release the lever to close the opening from the toilet to the black tank. Pull the lever halfway to add water to the toilet bowl. Refer to the Toilet Owners Manual for operation, troubleshooting, cleaning, and parts.

NOTE: *It is highly recommended that you use an RV type toilet paper because it breaks down quickly and is easily discharged when the black tank is emptied.*

Drain Systems / Holding Tank Evacuation

To provide complete self-containment, and to comply with requirements of good sanitation practices, Born Free Motorcoaches are equipped with a dual tank drain system. The sanitary holding tank (black waste tank) on rear bath models

receives waste from the toilet and the bathroom lavatory. The black waste tank for all other models receives waste from the toilet only. The second tank (gray water tank) collects wastewater from the sinks and from the shower.

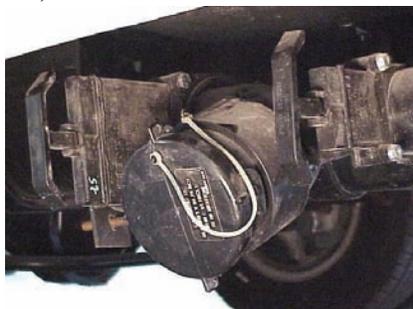


Figure 5.4

These two tanks share a common outlet (Figure 5.4) (located on the driver's side, at the rear of the motorcoach) and each tank has its own slide valve.

The black waste tank should be emptied only at authorized sanitary disposal stations or sewer hookups at a campground. Position the motorcoach at the sanitation station so the sewer connection is located near the drain opening. Remove the cap on the drain opening and install the sewer hose to the connection. Place the open end of the sewer hose in the disposal drain, making certain it stays in

position during the entire evacuation process. DO NOT open both valves at the same time – opening each valve separately will eliminate the risk of the contents of either tank running into the other. Each tank should be drained separately. The black waste tank should be emptied first. Pull the slide valve handle all the way out so the contents will run out in a quick, flushing manner. When the black tank is empty, close the valve. Empty the gray water waste tank in the same manner. Each tank should then be rinsed to assure all waste has been removed. If the motorcoach has a black water tank flush system, it can be used to flush the black water tank. If it does not, the best method of rinsing the tanks is to make certain the slide valves are closed and then partially fill the black tank through the toilet and the gray tank by turning a faucet on in one of the sinks; open the slide valves again to allow the rinse water to empty. When they are again empty, close the slide valves. Disconnect the sewer hose, rinse it, and replace it in its carrier.

When you are parked at a campsite with sewer hookup facilities, connect the drain hose, making sure the connection is tight so septic odor does not come back into the coach. A secure connection to the sewer hookup is highly recommended, and, in some cases, required by the campground. The valves should remain closed until the tanks need to be emptied. The method for emptying the black waste tank and the gray water waste tank is the same as previously described.

Seasonal Protection –

NOTE: **Do not use automotive-type antifreeze. This ethylene glycol-type antifreeze is poisonous and is not approved for potable water systems.**

Winterizing

Two gallons of RV antifreeze will be sufficient for this process:

1. Make sure the water pump, water heater and gas are turned off.
2. Relieve pressure in the water lines by opening and then closing a hot and

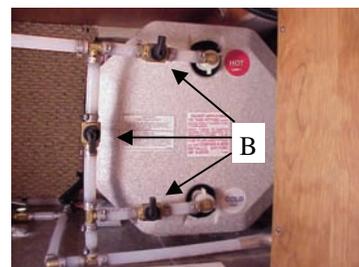


Figure 5.5

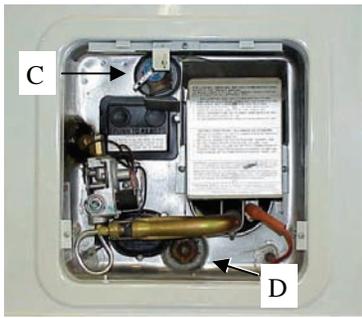


Figure 5.6

cold faucet.

3. Turn the valves on the back of the water heater (Figure 5.5) to the bypass position (B) so water can flow through the system but not into or out of the water heater.
4. Go to the

outside of the motorcoach, open the water heater door, (Figure 5.6) and open the pressure relief valve (C) to relieve pressure in the tank. Remove the anode rod (D) from the tank to drain the water from the heater. When the water heater has been drained, close the pressure relief valve. Leave the anode rod out until the water heater is again needed. Refer to your water heater manual for more information on winterizing.

5. Locate the fresh water tank; follow the white outlet hose to a drain valve that allows water to drain through the floor of the motorcoach. Open the valve to drain the tank.
6. After the fresh water tank has been drained, close the drain valve. Continue to follow the white hose from the drain valve toward the

water pump to a brass 3-way siphon valve (Figure 5.7). Turn the handle (E) so it is perpendicular to the

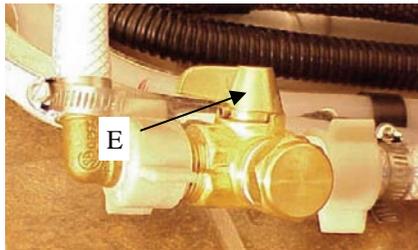


Figure 5.7

direction of the water line. The 3-way siphon valve will be later used to add RV antifreeze to the lines (Step 9).

7. Search for other drain valves (Figure 5.8) throughout the motorcoach and open them (F) so water can drain from the lines. These drain valves may be located below the kitchen sink,

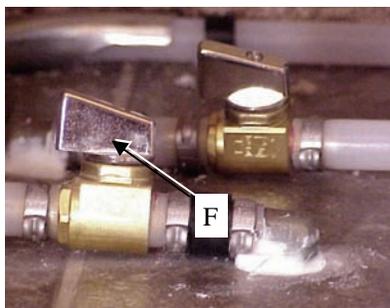


Figure 5.8

below the stove, near the water heater, or in the outside compartment near the base of the ladder. To assist in the draining process, open all hot and cold faucets to allow air into the system. When draining the lines to the outside shower, press the lever on the shower head while opening the hot and cold faucets.

8. When all of the lines have been drained, close all drain valves and faucets.
9. Locate the brass 3-way siphon valve and remove the protective cap. Replace the cap with one end of the siphon hose and place the other end into a container of RV antifreeze. (Make sure the valve handle is pointed toward the siphon hose.)
10. Turn on the water pump and then individually turn on the bathroom vanity faucet, tub faucet, showerhead, toilet, toilet spray hose, outside shower, and kitchen faucet until both hot and cold flow pink with RV antifreeze.
11. Pour RV antifreeze down the sink and tub drains to fill the p-traps.
12. Turn the water pump off.
13. Remove the winterizing hose from the brass 3-way siphon valve and replace it with the protective cap.
14. Dump the black and gray tanks. Your winterizing should be complete.

Along with protecting the water and drain systems, we advise you to follow these simple suggestions for proper winter storage:

- Remove all bedding and clothing to prevent mildew.
- Remove all goods and clean cupboards.
- Affix newspapers to inside windows with masking tape. This will protect your carpet, curtains, and cushions from ultraviolet damage.
- Clean the refrigerator thoroughly and place an open package of baking soda inside. The refrigerator door should be left open.
- Clean all appliances and stove vents.
- Turn LP tank valve to “off”.
- Turn battery disconnect switch to “off”.

Summer De-Winterizing

1. Fill the fresh water tank with clean water.
2. Turn the valve on the brass 3-way siphon so it is parallel to the flow of the water.
3. Turn the water pump on.

4. Turn on all faucets, the toilet, and hoses. Let them run until they flow clear with water.
5. Insert the anode rod into the water heater and secure it in place.
6. Turn the bypass valves on the rear of the water heater on so all of them (3) are in a horizontal position.
7. With the valves turned correctly, the water heater will start to fill with water. Lifting the stem of the pressure relief valve will allow the water heater to fill faster. When water comes out of the pressure relief valve, the heater is nearly full. The pump will continue to run in order to complete the filling process.
8. When the water heater is full of fresh water and the water lines are pressurized, the water pump should cycle off. Check all pressure connections in the water system; they should all be secure and free of leaks. The de-winterizing process is now complete.

Disinfection of Potable Water Systems (RV's)

As approved by the U.S. Public Health Service — to assure complete disinfection of your potable water system (a new system, one that has not been used for a period of time, one that may have become contaminated, or before a long storage period (such as over the winter)) the following procedures are recommended:

1. Prepare a solution using one gallon of water and ¼ cup household bleach (sodium hypochlorite solution). Pour the chlorine solution into the tank when it is empty. One gallon of solution should be used for every 15 gallons of tank capacity. This procedure will result in a residual chlorine concentration of 50 ppm in the water system.
2. Fill the tank with potable water. Open each faucet, both hot and cold taps, running water until a distinct odor of chlorine can be detected (in the water being discharged).
3. Allow the system to stand for at least four hours when disinfecting with a 50 ppm solution. If a shorter time period is desired, then a 100 ppm chlorine concentration should be permitted to stand in the system for at least one hour. (For a 100 ppm concentration, use ½ cup of household bleach with one gallon of water to prepare the chlorine solution.)
4. Drain and flush with potable water.

6.0 Tire Inflation and Vehicle Loading

Vehicles manufactured by Dodgen Industries, Inc. are carefully designed and built to ensure the actual Gross Vehicle Weight (GVW) and the Gross Axle Weight (GAW) of completed vehicles are lower than the Gross Vehicle Weight Rating (GVWR) and the Gross Axle Weight Rating (GAWR) established by the chassis manufacturer.

Since the actual vehicle weights are lower than the maximum vehicle and axle ratings established by the chassis manufacturer, the tire pressure standard used by Dodgen Industries, Inc. for completed vehicles is also lower than the maximum tire pressures established by the chassis and tire manufacturers.

The following chart depicts tire pressure standards for 'Load Range E' rated tires applicable to vehicles manufactured by Dodgen Industries, Inc.:

	<u>Standard psi</u>	<u>Maximum psi</u>
<u>Ford E-350/450</u>		
Front:	50	65
Rear:	70	80
<u>Chevrolet Kodiak</u>		
Front:	75	95
Rear:	80	95

The owner of a vehicle manufactured by Dodgen Industries, Inc. is responsible for determining the optimal tire pressure to be used for their vehicle — dependent upon cargo weight and driving conditions under which they operate the vehicle. Overloading or under-inflating the tires can have negative effects, including rapid tire wear, tire failure, reduced handling capability, and dangerous on-road breakdown. The tire pressure standards cited above were selected as safe and reasonable baselines from which each owner will be able to make adjustments — dependent on their particular needs.

Air Bag Suspension

Born Free Motorcoaches are equipped with an air bag suspension system. The system enables you to compensate for additional loads you may be carrying in the coach, to offset trailer towing tongue weight or to simply aid you in making minor leveling adjustments in order to increase gas appliance efficiency.

Proper inflation of the airlifts can reduce the choppy ride sometimes caused by truck tires and springs, thus resulting in the smoothest ride possible.

The airlift system is made up of two air bags mounted to the rear axle; it is inflated by separate fill valves located by the driver's side wheel well (Figure 6.1). Simply add air to each of the fill valves in order to achieve proper leveling of the motorcoach. Minimum air pressure is 10 PSI and maximum is 90 PSI. As a general rule, air springs will support approximately 40 pounds of load for every pound of inflation (per pair).



Figure 6.1

For example, 50 PSI of inflation will support a load of 2000 pounds per pair. For the best ride, use only enough air pressure to level the vehicle when viewed from the side (front to rear). This amount will vary, depending on the load, location of the load, condition of existing suspension, and personal preference.

N O T E: *Too much air pressure will cause a stiffer ride, while too little pressure will cause the vehicle to bottom out. Never inflate the bellows above 90 PSI. Refer to the decal on the motorcoach near the air bag fill valves for inflation information.*

Vehicle Loading Tips

When loading heavy items, balance side to side and front to rear; do not put heavy items all in one compartment. After you have established what you will load into the motorcoach, put your standard load on the coach, fill it up with gas, water, and LP and then get individual wheel weights (or at least

front and rear).

Trailer Towing

Whenever a motorcoach is used for towing, adhere to the limitations listed below:

- The towing hitch (Figure 6.2) on the Born Free is a Class 3 Rated Hitch (500 pounds – tongue weight / 5000 pounds towing weight). Towed vehicles and trailers must not exceed the hitch ratings. The electrical connection for towing is located on the bumper (Figure 6.3).
- The Gross Combined Weight (GCW) must not exceed the Gross Vehicle Weight Rating (GVWR).
- Trailers weighing in excess of 1000 pounds require trailer brakes.
- Be aware that most states and Canadian provinces require braking systems on tow vehicles. This requirement is for both trailers and drivable vehicles.



Figure 6.2



Figure 6.3

Gross Combined Weight (GCW — tongue weight plus motorcoach weight) equals the total weight of a fully equipped motorcoach and trailer with cargo, driver, passengers, fluids, etc.

Do not restrict radiator airflow by mounting a front-mount spare tire, trail bikes, etc. to the front of the motorcoach.

C A U T I O N: *Installation of a frame-type equalization hitch on a motorcoach is not recommended.*

Towing & Tips

The OEM chassis for your motorcoach is equipped with brakes for braking the chassis only. It is not intended as a braking system for a towed vehicle. For safe towing operation, it is recommended that all towed vehicles be equipped with a separate functional braking system. You should refer to

your chassis owner's manual and trailer towing guide for additional information and you should always follow guidelines for safe operation. If your towed vehicle is equipped with an automatic transmission, your vehicle dealer or manufacturer should be able to provide you with specific towing requirements.

When you tow a vehicle with all four wheels down, you should consult with your towed vehicle dealer or manufacturer prior to towing. Not all vehicles can be towed in this manner.

It is the responsibility of the motorcoach owner, when they tow another vehicle, to do it in a safe, responsible, and legally approved manner. Born Free Motorcoach can accept no responsibility for the owner's negligence or disregard for state or federal laws.

When towing . . .

- Make extra wide turns to compensate for the wider turning radius of the trailer or tow vehicle.
- When backing up, move the trailer to the left by turning the front wheels of the motorcoach to the right. To turn the trailer to the right, turn the front wheels of the motorcoach to the left.
- Place wheel blocks (chocks) under the trailer wheels before setting the tow vehicle's brakes and transmission. The blocks will absorb the stress and secure the trailer.
- Frequently check operation of trailer brakes and trailer lights.
- Decrease trailer load substantially for high altitude driving.

Driving Tips

Your Born Free Motorcoach will drive very much like your "family car". The biggest difference in handling will come from the increased weight, width, height, and length. These differences will become second nature to you after just a few miles. The Born Free Motorcoach may be driven at interstate speeds, just like your car; it will, however, take a bit longer to achieve the maximum driving speed. The motorcoach will slow more when climbing an incline because of the added weight; you should allow yourself more time and room for overtaking and cutting back when maneuvering a

pass.

Because the Born Free Motorcoach is wider, than the "family car", consideration should be given when maneuvering through tight places. When maneuvering through a tight place, it is best if you have your co-pilot get out and walk with the motorcoach as it moves. Station the co-pilot at the left rear of the motorcoach where you can observe his/her signals.

As you become more familiar with your Born Free Motorcoach, you will become more aware of its additional weight, length, and width. As you approach low hanging branches or low building canopies, the height of the motorcoach must be a constant thought. For proper clearance, in most cases, eleven (11) feet should be allowed for a motorcoach with a roof-mounted air conditioner.

An experienced traveler "walks his rig" at every stop; it takes but a minute to make a trip all the way around to look at the motorcoach to ensure all caps are in place, access doors are secure, and tires are well inflated. The rear inside duals should be checked either by kicking them or hitting them with a tire iron. An under inflated tire will move on the rim causing heat to build-up, or, possibly a fire. "Once around before in" is a good policy to follow.

Fuel efficiency of the Born Free Motorcoach depends on several factors: (1) The load it's carrying; (2) The size and weight of the motorcoach body; and (3) Driving habits and general condition and maintenance of the vehicle. Adding a trailer to the motorcoach will place an additional load on its engine and will subsequently reduce the fuel economy.

Some suggestions for increasing fuel economy:

- Refer to the Chassis Owner's Manual for break-in instructions and driving speeds the first 1,000 miles.
- Change the oil and filter according to the manufacturer's recommendations.
- Manually shift the automatic transmission when appropriate.
- Inspect air and fuel filters frequently when encountering excessive dust, bugs and debris.
- Keep cargo to a minimum.
- Make sure tires and air bags are properly

- inflated.
- Restrict dash air conditioner use when possible.

Operating Tips – Diesel Owners

Special precautions need to be taken when dealing with diesel engines. It is not uncommon for diesel fuel to become contaminated with water, and so a water drain separator, along with a bleeder valve, has been placed on the bottom of the fuel filter. If water is in the fuel, a warning light on the dash will alert the driver to the problem. If the warning light comes on, you should contact a Ford dealer to have the problem remedied.

When the outside temperature drops to 20 degrees, an anti-gel additive can be added to the fuel (to prevent gelling). If the temperature remains below 20 degrees, #1 diesel fuel should be used.

Remember to allow the “wait to start” light to go out before engaging the starter. Do not crank for more than 15 seconds at a time; wait 30 seconds before the next try. In cold climates, the 110-volt engine block heater should be used to assist in starting the engine.

Please refer to the Chassis Owner’s Manual for break-in instructions and driving speeds the first 1,000 miles.

Routine Maintenance

Born Free Motorcoach suggests the following guidelines be used when operating a Born Free Motorcoach:

- Change engine oil and filter at 3000 mile intervals. Please refer to the Ford owners manual for oil specifications.
- Rotate tires at 5000-7500 miles and again at 10,000-15,000 miles.
- Wash regularly with a mild soap – do not use abrasive cleaners.
- Seal the motorcoach twice each year using a good polymer sealant.
- Check the caulking twice each year and replace if needed. Sikaflex 521-UV caulking is recommended.
- Contact a truck alignment shop and have them align the front end at approximately 2500-4000 miles. If the motorcoach pulls to one side, immediate alignment is necessary. Failure to take immediate action can result in severe tire

wear and create a very hazardous driving condition.

- Service the auxiliary generator per the manufacturer’s guidelines.

Travel Tips

Some traveling tips to keep in mind when you’re on the road with your Born Free Motorcoach:

- Remember to “think high and wide” - save the top and sides of your motorcoach.
- Keep an eye on service station attendants. They may accidentally fill your water tanks with gas or vice-versa. They may also fill your motorcoach with the wrong type of fuel.
- Use manned toll gates – you will typically be charged one class more than a car. States may or may not require you to stop at weigh stations.
- Check the oil every time you stop for fuel.
- Check wheel lug nuts before each trip begins.
- Do not leave food or odor-causing materials in your vehicle for extensive periods of time.
- Once a month, inspect your fire extinguisher for proper charge. It’s also a good idea if everyone using the motorcoach knows where the fire extinguisher is located and how to use it in case of an emergency.
- Conduct a tour of your vehicle before departure to ensure all compartment doors are closed and locked, cabinet doors are closed, and refrigerator doors are secured.
- First time motorcoach owners may have a tendency to crowd the centerline of the highway. Check your mirrors frequently to prevent this from happening.
- When fogging appears on the motorcoach’s windows, an excessive amount of humidity exists inside the vehicle. In extreme cold conditions, the humidity can turn to frost or ice. To alleviate this excess moisture problem, open a roof vent slightly or open a window. Operating power vents will also help.
- Taste the water before filling your fresh water tank.
- Conserve water when taking a shower by taking “sea showers”. Wet down and soap from water saved in lavatory, then use the on/off button on the showerhead. Turn the water on and rinse.
- Dump sewage only at approved dumping stations.
- During peak camping season, phone ahead for a camping spot.

- Sleeping bags save work. They take less space than blankets and are usually warmer.
- Some states will not allow you to pass through highway tunnels with LP gas on board your vehicle. If your route includes a tunnel, check with authorities before venturing out.
- Emergency items you should have in the motorcoach:
 - a. Flashlight
 - b. First Aid Kit
 - c. Emergency Flares
 - d. Tool Box
 - e. Plastic Bucket
 - f. Tow Chain / Rope
 - g. Wheel Blocks (for leveling) / Extra Jacks
 - h. Water Hose
 - i. 100-150 Foot Electrical Cord – 50 Amp Minimum Rating
 - j. Fire Extinguisher
 - k. Hydraulic Jack and Lug Wrench
- operations.
- Turn on water pump; check water system for leaks
- Check all faucets (Hot and Cold)
- Test operation of the toilet
- Test operation of the water heater
- Check smoke detector and carbon monoxide detector batteries.

Pre-Trip Inspection

- Inspect springs, shocks, and steering mechanism.
- Check fluid levels – radiator, brake fluid, and washer fluid.
- Examine tires for wear; test for proper inflation.
- Test auxiliary battery for charge and condition – clean battery posts if necessary.
- Check all running lights, turn signals, and panel lights.
- Test horn.
- Check windshield wiper condition.
- Make certain outside mirrors function properly
- Test operation of generator
- Check dumping equipment (secure, clean, working order)
- Test all coach lights
- Test operation of furnace
- Test operation of air conditioner
 - (1) Check air filters and clean if necessary; make sure cooling unit coils are clean and free from debris.
 - (2) Check condensing unit to make certain it is clean and free of obstructions. Air flow should not be blocked.
- Test operation of refrigerator; look at pilot light to ensure the flame is blue in color.
- Test microwave, range, hood, and stove

ATTENTION OWNER

- Proper front-end alignment is critical. Not only will it keep your new Born Free Motorcoach properly handling as you drive down the road, but it will also help you get the maximum life out of your tires. Your Born Free Motorcoach was aligned at the factory, but without any load. The motorcoach's alignment will change as the vehicle breaks in.

The individual tire pressure you choose for your ride, the pressure you choose for the air bag suspension (if you have this option), truck springs as they soften with use, the load (equipment, accessories, personal belongings, etc.) you add and their location in the vehicle can all have an effect on the alignment.

It is important for you to outfit and prepare your vehicle the way you intend to use it, and then have the front-end alignment checked. Choose a reputable alignment shop with experience in larger vehicles and specifically the Ford Twin I Beam Axle Design. Dodgen Industries, Inc. / Born Free Motorcoach is under no obligation to pay for this alignment, because each customer will outfit their vehicle uniquely.

If you need assistance, please call our Customer Support Division at 1-800-247-1835.

- Many times, Born Free Motorcoach owners look for ways to improve the mileage and power performance of their vehicles. One alternative many people consider is dual engine exhaust systems.

We do not recommend you convert your vehicle to dual exhaust. The wires, fuel hoses, generator fuel line, electrical isolator, and optional hydraulic jack pump and reservoir of your coach are positioned so they are shielded, or are far enough away from, the single exhaust system and catalytic converter to withstand the higher temperatures of today's vehicle engine. Adding dual exhaust would put these components an unsafe distance to the heat generated from the additional exhaust pipe.

Installing dual exhaust may negatively impact your

warranty on many of the components listed above, therefore, we do not recommend that you do this.

Questions should be directed to the Customer Support Division.

- Every Born Free Motorcoach has an onboard water pump system. Unlike the city water coming into your home, you have the ability (in your motorcoach) to shut your system off with a switch (located in the range hood face above the cooktop).

RV's have numerous plastic fittings and lines, which, when put together, make up the water system. You should never leave your water pump on when the motorcoach is in motion. If a fitting or line should break due to the stress of some poorer roads, you may not hear the pump running above the engine or radio. If a leak should occur, you could experience water damage in your coach. The risk of this happening is slight, but you should be aware of it.

We also recommend turning **off your pump when you leave your vehicle for any length of time.** Small drips can occur, just like in your home plumbing, around faucets and drains. If the pump is left on, the pressurized water system will continue to leak in your absence. When you are in the vehicle you will hear the pump run for a second or two; this is a telltale sign that there is a leak. To avoid problems, periodic inspections of the drain p-traps, faucet connections, and water line connections are recommended.

Note: Plumbing fittings may loosen or even break under certain road conditions. It is critical you follow these guidelines.

We strive to use the very best products available in the manufacture of the Born Free Motorcoach. We feel our plumbing system is superior to other brands, but we also want you, the owner, to be aware of potential problem areas and take the necessary precautions to avoid them.

Please feel free to contact Born Free Motorcoach's Customer Support Division with any questions or concerns.

